

BULLETIN

of the

ILLINOIS NATURAL HISTORY SURVEY

HARLOW B. MILLS, *Chief*

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# The Leafhoppers, or Cicadellidae, of Illinois

(Eurymelinae-Balcluthinae)

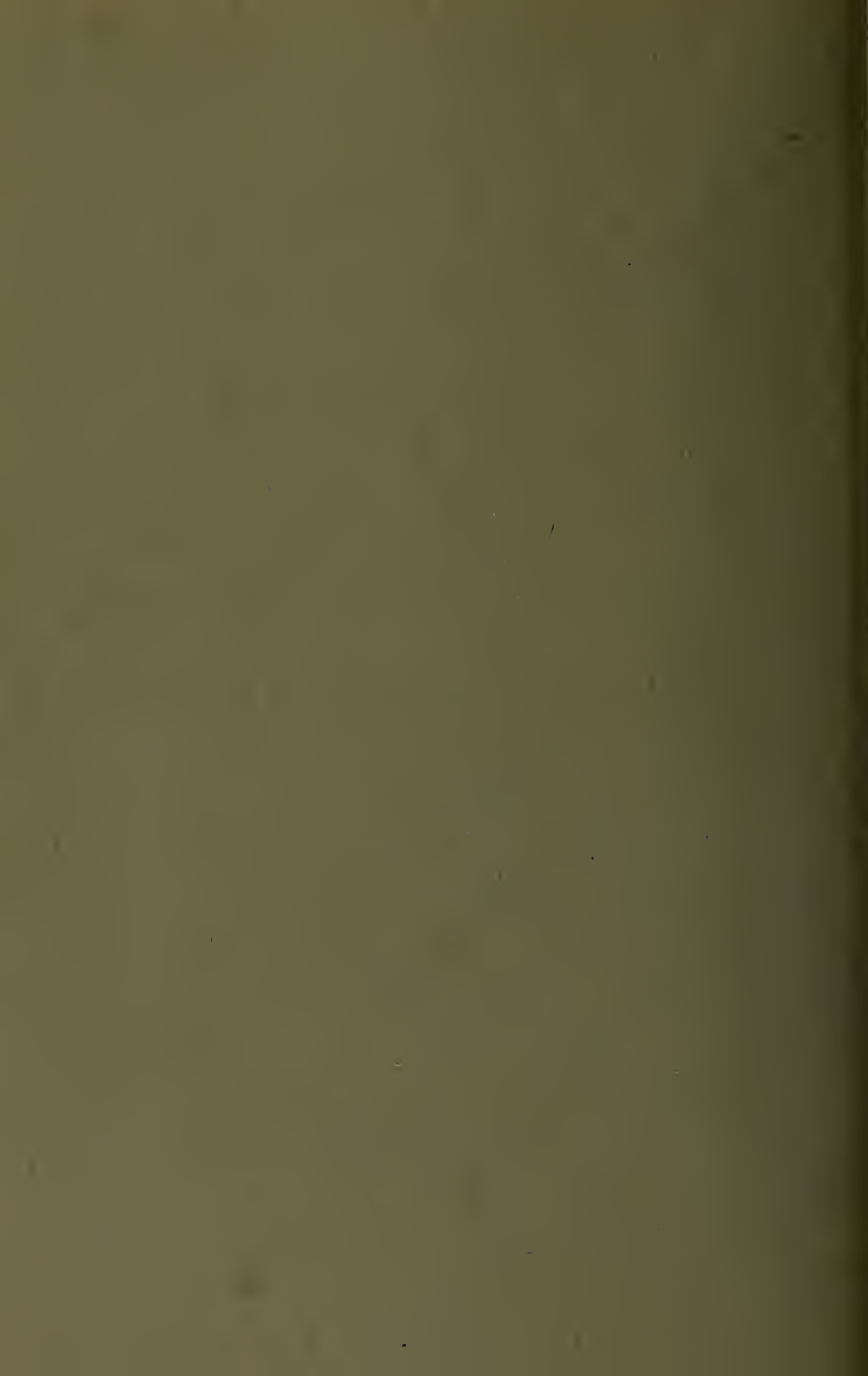
D. M. DELONG



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Article 2

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The Leafhoppers,  
or Cicadellidae,  
of Illinois  
(Eurymelinae—Balcluthinae)

D. M. DELONG



*Printed by Authority of the State of Illinois*

URBANA, ILLINOIS

*June 1948*

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*This paper is a contribution from the Section of Faunistic Surveys and Insect Identification.*

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## FOREWORD

IN 1934 a project was organized to investigate the Cicadellidae, or leafhoppers, of Illinois and to prepare a comprehensive report on the fauna of the state. Dr. D. M. DeLong, Ohio State University, Columbus, Ohio, very kindly accepted the post as project leader to direct the field work, identify the material, and write the final report. Accordingly, Dr. DeLong was employed by the Illinois Natural History Survey as Assistant Entomologist during the summers of 1934, 1935, 1936, and 1938, and as Research Entomologist for shorter periods in 1941 and 1945.

In general pattern, the field program for the leafhopper study followed that for the Natural History Survey's study of other groups, such as the Miridae. From 1934 through 1936 collecting trips, to various parts of the state, were planned to include as many diverse ecological types as possible. Areas of natural vegetation provided the most extensive faunal possibilities. Many of these exist throughout Illinois in the state parks and forests, in national forests, along railroad rights-of-way, and in small scattered areas that are not readily arable. Altogether, several hundred thousand leafhoppers were collected, of which over 30,000 were mounted for study and added to the 5,000 specimens already in the Survey collection. Because of the size of the group it was decided to exclude from the present report the large subfamily Cicadellinae (formerly Typhlocybinae).

During the period of the 1930's, the taxonomic status of many leafhopper genera was in a state of flux, because of the increasing employment of genitalic characters for specific identification. In consideration of this, the preparation of the final leafhopper manuscript was postponed for several years pending studies of various large genera such as *Gypona* and *Idiocerus*.

A large portion of the identifications and preparation of the manuscript was done by

Dr. DeLong at Columbus, Ohio, and we are very grateful to him for contributing so much of his own time to this project. We also wish to express our gratitude to Dr. Herbert Osborn of Ohio State University, Dr. P. W. Oman and Dr. H. E. Dorst of the U. S. Department of Agriculture, and Dr. R. A. Beamer of the University of Kansas for the loan of drawings or cuts, for permission to use illustrative material, or for other assistance; and to Miss Ruth V. Hershberger of Ohio State University for making many drawings of diagnostic parts.

Several members of our staff in the Section of Faunistic Surveys and Insect Identification have contributed materially to the project. All members of the section have assisted with the field program. The original total views of leafhoppers are the work of Dr. Carl O. Mohr, Associate Entomologist and Artist. Mrs. Elizabeth N. Maxwell, Artist, has contributed many drawings of diagnostic parts used in the subfamily and generic keys, and she and the Survey draftsman, Mr. James W. Curfman, have assembled, numbered, and lettered the plates. Miss Phyllis A. Beaver, Laboratory Assistant, assembled and summarized the Illinois records in our files, and Dr. B. D. Burks, Associate Taxonomist, prepared the bibliography. Adapting the manuscript to current Survey practices, modifying the keys to emphasize as much as possible characters that could be illustrated, and integrating in our office the many parts of the manuscript represent the painstaking and effectual work of Dr. Milton W. Sander-son, Associate Taxonomist. The index to scientific names was made by Mrs. Leonora K. Gloyd, Laboratory Assistant. We have enjoyed throughout the help and cooperation of the Survey Technical Editor, Mr. James S. Ayars.

HERBERT H. ROSS,  
*Systematic Entomologist*



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An area of marsh grasses in an oak woods near Amboy, Illinois. The diversity of plant species in this spot makes it an ideal collecting ground for leafhoppers. Distinctive forms of trees, shrubs, herbs, or grasses all occur within this small area.



# The Leafhoppers, or Cicadellidae, of Illinois

(Eurymelinae-Balcluthinae)

D. M. DELONG

THE leafhoppers, or Cicadellidae, constitute one of the largest families of insects in North America and also in the entire world, rivaling in number of species such groups as the rove beetles, or Staphylinidae, the hymenopterous family Ichneumonidae, and the weevil family Curculionidae. When complete, the Illinois list of leafhoppers will probably be close to 700 species. This report deals with about half of the Illinois leafhopper species, comprising 16 subfamilies. The other half belongs to the large subfamily Cicadellinae, which is not treated in this report except for a key to the genera.

Three hundred thirty species of the subfamilies here treated are recorded from Illinois. Additional species whose range indicates that they might be found in the state with subsequent collecting have been added to the keys for the purpose of giving a more thorough understanding of the Illinois species.

Many leafhopper species are economically important, either inflicting direct damage to crops, or transmitting plant diseases. These species are difficult to differentiate from many forms considered to be of little or no economic importance. One of the principal aims of this report is to set forth keys and illustrations for their identification.

## BIOLOGY

Some species of leafhoppers pass the winter in the egg stage and others in the adult stage. Overwintering eggs, present in plant tissues, hatch somewhat late in the

spring, usually in May or June, and the nymphs feed on the new, tender leaves. Species of leafhoppers that pass the winter as adults normally come out of their hibernation quarters during the first warm days of spring and begin to lay eggs as soon as the leaves of their host are fully developed. These eggs hatch in about 10 days. There are five nymphal instars in the life cycle before the adult stage, which usually requires from 12 to 30 days, depending upon the species and the climatic conditions. As a rule, leafhoppers have one or two generations per year but, where completion of the cycle is rapid and cropping conditions or sequence of plants furnishes an abundance of food, other generations may be produced. *Empoasca fabae*, the potato leafhopper, and certain species of *Erythroneura* produce probably the largest number of broods.

About 10 years ago, the writer (1938a) reported in some detail upon the biology of the potato leafhopper, which might serve as a specific example for the discussion of various biologic phenomena and developmental stages. The adults of this species may mate within 24 hours after emergence; the preoviposition period may be as short as 3 days and it averages less than 6 days. The eggs are inserted singly into tender stems of leaf veins. The number of eggs produced varies considerably in this species. In general, the females lay eggs for a month or more and produce about 75 eggs in this period. In 1926 one second generation female produced 226 eggs in 47 days, an average of 4.8 eggs per day. The highest daily egg-laying record was 8 eggs in a 24-hour period. In the same year, 51 females

produced 2,327 eggs. One female deposited 195 eggs over a period of 92 days and another 216 eggs in 85 days. The average incubation period for 1,964 observations during a single season was approximately 10 days. The minimum incubation period observed was 7 days and the maximum 19 days. There seems to be a definite correlation with temperature conditions.

In the process of hatching, the nymph pushes itself through the egg membrane and the plant epidermis; at this time the legs extend tightly along the ventral side of the body to the tip of the abdomen. By a backward and forward swaying motion of the body the legs are freed; then the tip of the body is soon freed, and the nymph becomes active upon the plant. The time required for nymphal development varies from a minimum of 10 to a maximum of 22 days, depending upon temperature. The average number of days from egg to adult is usually 12 to 14 in a normal season.

Four distinct broods of the potato leafhopper occur, the fourth giving rise to only a small number of individuals in the northern states.

**Hibernation.**—Several common species of leafhoppers are known to pass the winter in hibernation as adults in leaf mold and under the loose bark of trees. Species of *Agallia*, *Macrostelus*, *Balclutha*, *Polyamia*, *Levacephalus*, *Paraphlepsius*, *Deltoccephalus*, *Exitianus*, and especially species of *Erythroneura* and *Empoasca* have been collected in hibernation and have been found coming out of hibernation in early spring. A large number of species of *Erythroneura* have been described from hibernating specimens only and nothing is known of their food plant and their relationship to plant associations.

Field observations and hibernation experimentation indicate that each spring *Empoasca fabae* migrates from the southern states into the northern states and does not normally pass the winter out of doors in Illinois or states of similar latitude.

**Feeding Habits.**—Insofar as known, all leafhoppers are plant feeders that, in feeding, puncture the tender plant tissues by piercing-sucking mouthparts. Such feeding studies as have been made indicate that most species feed upon the mesophyll and cause a white stippled appearance upon the foliage. *Empoasca fabae* and probably other species make exploratory punctures deep into the

tissue, causing the mechanical plugging of xylem and phloem vessels.

Not infrequently leafhoppers bite humans. Biting is common in certain leafhoppers attracted to lights, especially in little green species of the genus *Empoasca*. Their bite is sharp, but usually produces itching of only short duration.

## ECOLOGICAL RELATIONSHIPS

The leafhoppers are usually restricted to definite plant species or genera. The plants are in turn limited in their distribution to definite habitats due largely to climatic and edaphic conditions. As a result a species of leafhopper or a group of species can usually be associated with a definite habitat or plant association. The leafhoppers, however, are not invariably found wherever their hosts occur. Some species of leafhoppers seem to be distributed throughout the full range of their food plant, whereas others seem to be restricted by climatic factors to an area within the food plant range. This latter condition is exemplified by the species of *Idiocerus* occurring on *Crataegus*, which do not occur, apparently, throughout the entire range of their respective plant hosts.

The state of Illinois, with its long north and south axis and varied conditions, exhibits a variety of plant associations which afford interesting collecting and a variety of interesting northern, southern, and western species of leafhoppers. A large percentage of leafhopper species feed upon grasses, sedges, or herbaceous plants, and the varieties of prairies, sandplains, meadows, and marshes furnish excellent opportunities for obtaining many interesting records.

**Sand Habitats.**—The sand prairies along the upper Mississippi River at Fulton, Hanover, and Thomson, fig. 1, which are unique in the plant association of the state, contain species of leafhoppers that apparently do not occur elsewhere in Illinois. Such species as *Flexamia grammica*, which occurs on the large coarse sand reed (*Calamovilfa longifolia*), and *Polyamia herbida*, which is found on the short matted grasses of the same habitat, have not been discovered elsewhere in the state. In the same habitat occur *Flexamia areolata* and *abbreviata*, *Polyamia rossi*, *Hebecephalus cruciatus*, *Paraphlepsius solidaginis*, and *Chlorotettix brevidus* in addition to several more common species



Fig. 1.—Sand prairie at Thomson, Illinois. Many unusual leafhoppers of the genera *Flexamia* and *Polyamia* are found in such situations.

In the sand prairie at St. Anne in the eastern portion of the state south of Chicago, we also find *Flexamia areolata*, and in addition *Flexamia bidentata*, *Chlorotettix borealis*, and *Paraphlepsius maculosus*. On scrub oak in the same area occur *Eutettix pictus* and *Penthimia americana*. On the grasses of a different type of prairie, at Des Plaines,

where wild rose is a prominent plant species, *Laevicephalus praeus* occurs. The high well-drained prairie at Decatur contains two interesting western species of leafhopper, the "long-nosed" *Dorycephalus platyrhynchus* and the small striped *Commellus comma*. On the hot barren denuded soil in the Mississippi River valley at Alton are



Fig. 2.—Swale and sand dunes along the edge of Lake Michigan near Zion, Illinois. Many host plants of northern leafhopper species are restricted in Illinois to this area.



Fig. 3.—Mats of bearberry, *Arctostaphylos uva-ursi*, on the sand ridges along Lake Michigan, near Zion, Illinois. This plant is the sole host for *Texananus cumulatus*.

small patches of sparse short grasses upon which was found *Athysanella balli*.

At Zion, Illinois, the sand prairie along the shore of Lake Michigan presents still another habitat type, fig. 2. Here the short grasses are mixed with prostrate mats of bearberry (*Arctostaphylos uva-ursi*) and ground juniper (*Juniperus horizontalis*).

On the grasses are such species as *Paraphlepsius turpiculus*, *Dorydiella kansana*, *Graminella mohri*, and *Graminella oquaka*. *Dorydiella kansana* has been taken from *Scleria verticellata* in the *Eleocharis obtusa* association, and *Graminella mohri* occurs on *Andropogon furcatus*. The mats of bearberry, fig. 3, support large populations of



Fig. 4.—In the old Lake Michigan basin south and west of Chicago, near Oak Lawn and Evergreen Park, are many remnants of prairies such as this. They support a leafhopper fauna of unusual interest.

*Texananus cumulatus*, which apparently is limited in Illinois to this area alone.

The old Lake Michigan basin, south and west of the city of Chicago, presents a series of dry and wet prairies, fig. 4, which vary considerably in their plant composition. Certain portions of this area near Evergreen Park and Oak Lawn have been collected extensively with interesting results. At Evergreen Park on a heavy mat of prairie grasses *Flexamia rubranura*, *picta*, *inflata*, *Laevicephalus unicoloratus*, and *Remadosus magnus* were taken. A typical prairie species, *Mesamia nigradorsum*, was found abundantly on wild sunflower throughout this prairie. On a moister portion of the prairie, species collected included *Graminella aureovittata*, *Chlorotettix rugicollis*, *spatulatus*, *fallax*, and *Dorydiella kansana*, which seem entirely out of their range, since most of them except *Chlorotettix spatulatus* and *Dorydiella kansana* have been described from and occur either in Florida or along the Gulf or South Atlantic Coast. On small areas in this same Oak Lawn region where the water table is high and mats of fine *Eleocharis* occur, *Deltocephalus gnarus* is found.

**Isolated Grass Areas.**—Some of the most interesting captures were made in areas where isolated islands of more western vegetation are still present. One such area is a pure stand of small grass several feet square which is growing upon the high exposed cliffs west of the stream at White Pines Forest State Park. *Laevicephalus minimus* was collected in abundance in this habitat. On the shaded grasses under the pine trees *Palus detector* was found.

A similar type of habitat was found at Apple River Canyon State Park. There a stream has cut a deep gorge, leaving high rock-faced cliffs upon which are several types of wooded and herbaceous vegetation. Species like *Chlorotettix unicolor* and *balli* are rather abundant on the grasses of the flood plain. The grasses in the wooded areas support *Chlorotettix lusorius* and *Colladonus furculatus*. The entomologist who wishes to expend the energy to climb to the top of the rugged cliffs and search out small patches of short grasses is well repaid for his efforts by finding *Flexamia pectinata* in specific spots or pockets on the western cliffs. East and south of the Canyon in a similar situation *Polyamia dilata* and *saxosa*, rare in the state, and *Hebecephalus signati-*

*frons* may be found. The last mentioned species is more often found west of Illinois and may reach its eastern limit in this state.

**Marshes.**—Marsh grasses and sedges furnish another series of interesting habi-



Fig. 5.—Meadows of *Calamagrostis* and associated grasses in old lagoons of Lake Michigan, near Zion, Illinois.

tats. Along Lake Michigan, from Waukegan to Zion, extensive meadows of *Calamagrostis*, fig. 5, and associated grasses have developed from the old lagoons which were originally formed along the shores of Lake Michigan by wave action. On these grasses occur *Amplicephalus osborni*, *Limotettix striolus* and *parallelus*, *Chlorotettix spatulatus*, *fallax*, *obsenus*, and *Heccalus lineatus*. In the swamp portion, where the water table is closer to the surface, *Macrostelus potoria* and *slossoni* are found.

At the shallow margins of Fox Lake, fig. 6, and other northern Illinois lakes are often formed large areas that are filled with species of *Typha*, *Spartina*, and associated sedges and grasses. These associations abound in *Cicadula cyperacea*, *melanogaster*, and *smithi* (on *Spartina Michauxiana*) and *Euscelis sahlbergi*. The smaller grasses in these habitats often support species of *Paraphlepsius*, such as *humidus* and *altus*. In other marshes, fig. 7, are clumps of sedges



Fig. 6.—Marshes of varied floral content along the edges of Fox Lake, Illinois. Here is found a large variety of sedge and grass feeding leafhoppers.

that harbor *Laevicephalus shingwauki* and *Parabolocratus viridis*.

Associated with the cypress swamps of southern Illinois, as at Karnak and Olive Branch, are marshes that contain tall grasses and sedges upon which occur *Chlorotettix dentatus*, *melanotus*, and *limosus*.

In the marshes of the Chicago area is an abundance of *Hecalus lineatus* and *Para-*

*bolocratus viridis*, *major*, and also *grandis*.

The tamarack bog at Volo contains large areas of *Vaccinium*, fig. 8, upon which live species of *Ophiola*.

**Woodland Areas.**—One of the most interesting habitats found in the state is the Herod flood plain, a low flat wooded area which is only a few feet above the stream bed and which is furnished with a high



Fig. 7.—Especially rich in leafhopper species are marshes such as this one at Volo, Illinois, along the edge of a tamarack bog.

water table and a resultant moist soil condition, thus producing a luxuriant growth of vegetation composed of cane (*Arundinaria tecta*), several types of grasses, many

species found in this association are *Polyamia interrupta*, *Chlorotettix nudatus*, *lusorius*, *melanotus*, and *Paraphlepsius fulvidorsum*. Where *Impatiens* is found growing



Fig. 8.—Leafhoppers of the genus *Ophiola* are found on *Faccinium*, which grows extensively in a bog near Volo, Illinois.

annual herbaceous plants, and a few perennials. On the cane were found several species of *Arundanus*, namely, *nacreosus*, *flavotinctus*, *marginellus*, and *arundineus*, *Chlorotettix suturalis*, and *Polyamia arundinea*. The grasses and herbaceous plants support several species, the more interesting of which are *Chlorotettix iridescens*, *balli*, and *nudatus*, *Paraphlepsius rossi*, *Kolla geometrica*, and *Polyamia albocura*. Upon the small grasses at the margin of the stream in this shaded habitat is found *Polyamia brevipennis*.

The wooded areas, fig. 9, produce a variety of types of associations in different areas of the state. A wooded glen at Rocky Branch, Dolson, proved to be one of the areas containing the greatest abundance of species of leafhoppers. Several species of *Cloanthanus* and several species of *Scaphoideus* including *nigrellus*, which was taken only at this point, occur in this association. The association is composed of an open mixed mesophytic forest with a luxuriant growth of shrubs and herbaceous vegetation, some of which occur in rather low moist areas and some of which are found only on well-drained slopes. Some common

in shaded areas, *Macrosteles variata* occurs.

Near Shawneetown in the Ohio River area are shaded meadow grasses in low areas; upon the luxuriant growth occur such species as *Chlorotettix attenuatus* and *balli* and *Paraphlepsius latifrons*. At Vienna and Savanna where other types of open woodland are found, *Ophiola anthracina* and *Osbornellus unicolor* occur on the herbaceous vegetation.

In several places such as Oakwood and Eichorn, large patches of wild rice (*Elymus*) are growing in shaded places along streams or in low flat woods. On this food plant are found specimens of *Elymana inornata* and *acrita*.

The woodland trees themselves, in addition to furnishing shaded conditions for herbaceous plants, support several species of leafhoppers. Certain genera are apparently limited in their feeding habits to species of trees. As an example many of the species of *Idiocerus* occur upon willows: *Idiocerus snowi*, *alternatus*, *pallidus*, and *moniliferae*. In addition *Macropsis viridis*, *Empoasca obtusa*, *Neokolla hieroglyphica*, and other leafhoppers are found on willows. The



Fig. 9.—A lush growth of herbs in a wooded glade at Starved Rock State Park, Illinois. Such a habitat supports a leafhopper fauna very different from that found in the prairies.



Fig. 10.—Rolling hills near Elizabeth, Illinois. Both the open prairie and the hazel and aspen clumps (center background) have a distinctive leafhopper fauna.



Carolina poplar is a tree occurring in the same habitat with the willow which supports species of *Idiocerus* and *Macropsis*. Upon Lombardy poplar have been found *Idiocerus scurrus* and *Fieberiella florii*; the latter species also occurs upon some of the ornamental shrubs. A common ornamental shrub, *Tamarix*, which grows wild in certain areas of the United States, supports large populations of a bright green leafhopper, *Opsiopsis stactogalus*. Certain species of oak are food plants for *Alebra albostrigella*, *Eutettix pictus* and *luridus*, and *Penthimia americana*. The maples are usually infested with *Japananus hyalinus*. The walnut is the food plant for *Oncopsis verticis*, and the honey locust supports *Stragania apicalis* and *Macropsis junipennis* var. *gleditschiae*. Species of *Crataegus* are the food plants of *Idiocerus crataegi*, *fitchii*, and *provancheri*. Certain species of *Scaphoideus*, *Gyponana*, and *Ponana* live normally upon American elm. *Idiocerus hebetus* is a common species on quaking aspen. *Scaphoideus apalinus*, *Idiocerus apache* var. *juniperus*, and *Empoasca junipera* are common species on juniper. These and many other species occur upon our common species of trees, but more especially should be mentioned the fact that practically all species of forest and shade trees are food plants for many species of *Erythroneura*, *Empoasca*, and *Typhlocyba*, genera which have been mentioned only superficially in the present study.

**Open Hillside.**—The hillside pastures and short grass meadows of the Ozark foothills in the southern portion of the state present interesting associations and here many species have been taken in a single pasture. Space prevents the enumeration of all such species but the more common and interesting are *Acurhinus pyrops*, *Paraphlepsius irroratus*, *truncatus*, *tennessa*, and *pusillus*, *Texananus superbus*, *Chlorotettix galbanatus*, *necopinus*, and *viridius*, *Polyania inimica*, *weedi*, *obtecta*, and *simililaris*, *Flexamia picta* and *inflata*, and *Deltoccephalus sonorus* and *flavicosus*.

The hillside pastures of the Jo Daviess hills, fig. 10, in the northwestern corner of the state contain several of the same species. In addition to those, *Athysanella acuticauda* is a common species in this northwestern pasture region. Many other species of leafhoppers occur on the open prairie and in the hazel and aspen clumps of this part of the state.

## ECONOMIC STATUS

Several species of Illinois leafhoppers are known as pests of various plants and crops. Their piercing-sucking mouthparts injure plants by piercing the cells and vessels of the leaf or stem and sucking out the plant fluids. Slight injury may also be caused by the egg punctures of the larger species, which oviposit in leaf tissues.

The potato leafhopper, *Empoasca fabae*, is a major pest of potatoes in Illinois. The browning and curling leaf injury known as hopperburn apparently is caused by this leafhopper through the plugging of the conductive tissues of the stalks or veins. Where such injury occurs it prevents the manufacture and translocation of starches in the plant and usually the formation of potato tubers. This type of injury is not produced by other species of leafhoppers.

The rapid multiplication and growth of potato leafhoppers results in heavy populations and severe injury to potatoes in seasons of normal climate. Heavy populations of this pest also cause injury to other crops. Beans are injured by a cupping or curling of the leaves with the top of the leaf appearing humped. A hopperburn condition is often produced on rhubarb. On alfalfa a yellowing of the leaves is caused by leafhoppers, and young apple trees are frequently injured by the insects, which cause a severe curling of the newer leaves.

Apples are injured severely in certain seasons by leafhoppers of several genera. Species of *Erythroneura* and *Typhlocyba*, as well as *Empoasca*, cause damage, and species of *Gyponana*, *Idiocerus*, and other genera may occasionally become pests. The more abundant and common species infesting apples are *Erythroneura lawsoniana*, *maculata*, *obliqua*, *hartii*, and *ziezac*, *Typhlocyba pomaria*, and *Empoasca fabae* and *maligna*.

The species of *Erythroneura* hibernate as adults and lay eggs on the young developing shoots or leaves of apple in May and June. The eggs of *Typhlocyba pomaria*, *Empoasca maligna*, and of species of *Gyponana* and *Idiocerus* pass the winter in the bark of twigs and hatch early in the spring. In view of this fact, the populations upon the apple tree are composed of a complex of adults and immature forms of the various species. Severe populations cause the leaves to become stippled with white puncture

spots and often to turn brown and fall. When the apples are ripening in the autumn, the populations are often so abundant that the fruit is coated with "honeydew" excretions. It is common for the sooty fungus to grow in this excretion. The large *Gypsonana* leafhoppers make rather large egg punctures in the new twig growth. These leafhoppers probably are not of economic importance, but they leave large scars and occasionally become abundant. It is difficult to control them.

Certain species of *Erythroneura*, especially *comes* and *tricincta*, usually become pests of grapes, attacking the leaves and causing them to turn whitish, then yellow, and finally brown before they fall to the ground prematurely. By the time this partial defoliation occurs, the grapes are fully developed but not matured. The green leaves are necessary to produce the sugars for maturing the fruit. As a result of leafhopper attack, the marketed grapes are often sour and the quality is decidedly impaired by leafhopper defoliation.

Clover and alfalfa harbor a number of leafhopper species, among which are *Aceratagallia sanguinolenta*, known as the clover leafhopper, *Polyamia inimica*, *Unerus nigrifrons*, *Exitianus obscurinervis*, *Macrosteles divisa*, *Agallia constricta*, *Cloanthanus frontalis* and *acutus*, and *Empoasca fabae*. The most severe leafhopper pest of alfalfa is undoubtedly *Empoasca fabae*.

Forage crops of all kinds are attacked by leafhoppers, which are usually considered as minor pests of these crops but occasionally become quite abundant. The leafhoppers most often present on forage crops are *Draeculacephala* spp., *Graminella nigrifrons*, *Polyamia inimica*, *Exitianus obscurinervis*, *Macrosteles divisa*, *Psammotettix striatus*, *Paraphlepsius irroratus*, and *Cloanthanus* spp.

In addition to causing injury by direct attacks, certain species of leafhoppers are important as vectors in the transmission of plant diseases. The sugar beet leafhopper, *Norvellina tenella*, one of the best known of this group, transmits to sugar beet and other plants the virus disease causing curly top. In the early 1930's this disease was found on horse-radish in Illinois, associated with large populations of the vector. That infestation was apparently caused by a migration; leafhopper and disease disappeared in 1937 and have not recurred in Illinois since.

*Macropsis trimaculata* has been proved to transmit yellows, a disease fatal to peach trees. *Macrosteles divisa*, a common species on many types of plants, has been proved to be vector of another virus disease, aster yellows.

Where cranberries are grown commercially in the northern bog areas, *Ophiola striatula* and *osborni* are pests; the former has been demonstrated to be the vector of a virus disease known as false blossom of cranberries. Yellow dwarf of potatoes has been readily transmitted by *Aceratagallia sanguinolenta*.

## TAXONOMY

The Cicadellidae are most readily distinguished from other families of Homoptera by two rows of prominent spines on the long hind tibiae. The head usually bears two ocelli well separated from the large compound eyes by the basal portion of the vertex. Throughout the group the vertex varies greatly in length and general structure. In some genera it is very short and parallel margined and in others extremely long and foliaceous. Each of the first pair of wings has a definite claval area and a corium. The clavus in some genera is reticulate veined. In most genera the corium is crossed by two veins, frequently called the first and second sectors; the first sector is branched on the corium, forming an outer and inner branch; and there are usually one or two crossveins between the first and second sectors, always a row of apical veins, and usually a row of antepical veins. In a few species both brachypterous and macropterous forms occur.

In size, individuals of this group range from 3 to 12 millimeters in length. Usually the females are larger than the males and often differ from them in color and structure.

Some of the more recent and useful papers on the taxonomy of leafhoppers are by Johnson (1935) on the Cicadellinae (Typhlocybinae) of Ohio, Oman (1937, 1938a) on some North American and South American leafhopper genera, and Osborn (1928) on Ohio leafhoppers. Other useful works are a publication on Minnesota leafhoppers by Medler (1942), and a check list of Nearctic leafhoppers by DeLong & Knull (1945). These references contain many bibliographic citations to the Cicadellidae.

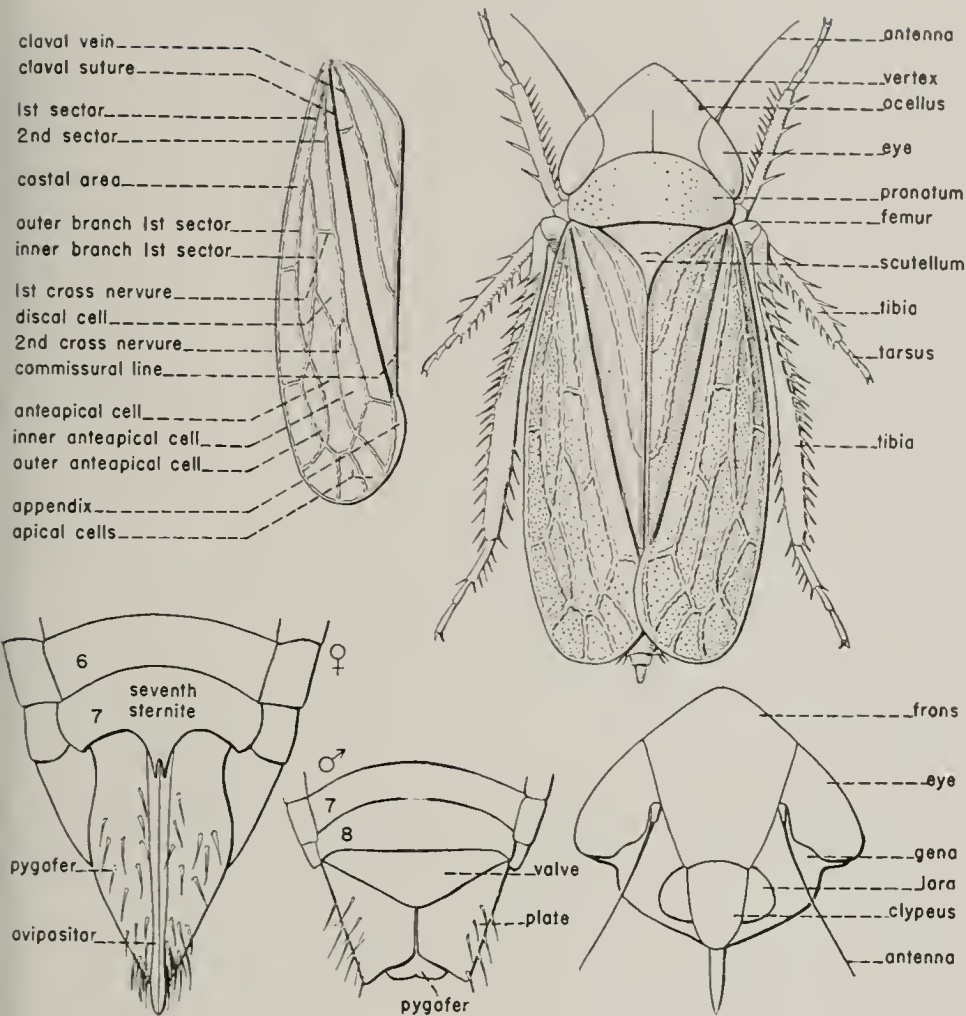


Fig. 11.—*Latulus configuratus*. Figures illustrating terminology for parts of body, elytron, and male and female external genitalia.

**Systematic Characters.**—The Cicadellidae are divided into subfamilies chiefly on the basis of position of ocelli, sutures of head, shape of pronotum, and venation, fig. 11. The general type and comparative length of head and the curvature of the vertex or the presence or absence of a foliaceous margin assist in the separation of genera in certain groups. Wing venational patterns, the presence or absence of certain branches, and the presence or relative numbers of reticulate crossveins or reflexed costal veinlets are valuable characters for generic distinctions. In the Cicadellinae the second pair of wings contains diagnostic

venational characters in addition to those in the first pair of wings. The generic separation of the members of this subfamily may be accomplished almost entirely upon the basis of wing venation. The male genital structures often assist in placing a species in its genus even though the entire specimen except this portion may be missing.

In most leafhopper groups the internal chitinous pieces of the male genitalia, fig. 12, are the most reliable structures known to date for specific diagnosis. In certain genera, those of the Macropsinae for example, we have been unable to date to distinguish the species by the genitalia; hence their species

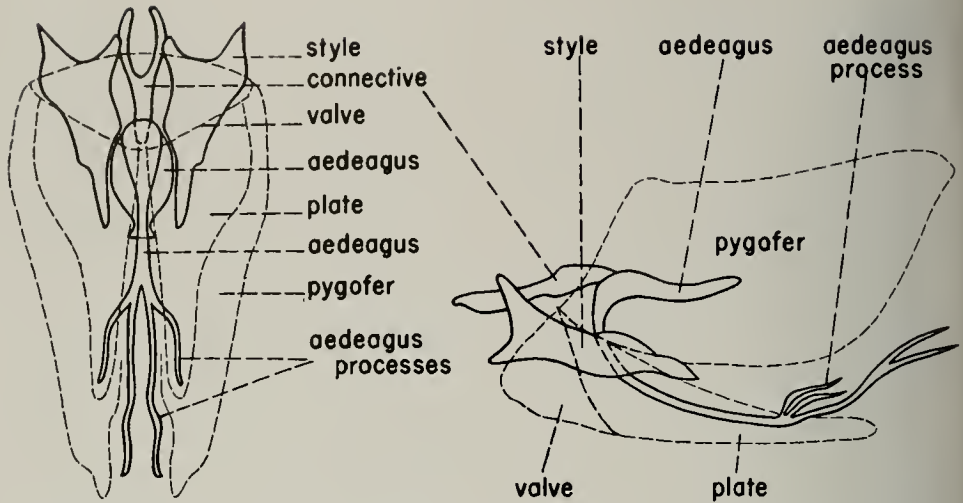


Fig. 12.—*Chlorotettix dentatus*. Figures of male internal and external genitalia illustrating terminology of parts.

are separated largely on the basis of color patterns. The external structures of the male are often very useful for separating species, but as a rule the internal structures of the genital cavity are more specific, especially the aedeagus and paired styles. In certain genera the shape and excavation or curvature of the posterior margin of the seventh sternite of the female, designated in some publications as the last ventral segment, is excellent for species separation. In other groups, the female seventh sternite in as many as 50 or more similarly colored or marked species may be identical. In such cases it is almost impossible to key the females to species. Insofar as possible, both sexes have been keyed to species in this report. Even when not used in the keys, the male genital structures have been illustrated if of value in assisting students to check the identity of species.

The keys to the subfamilies and genera were devised largely for the separation of the members of groups known to occur in Illinois and nearby states.

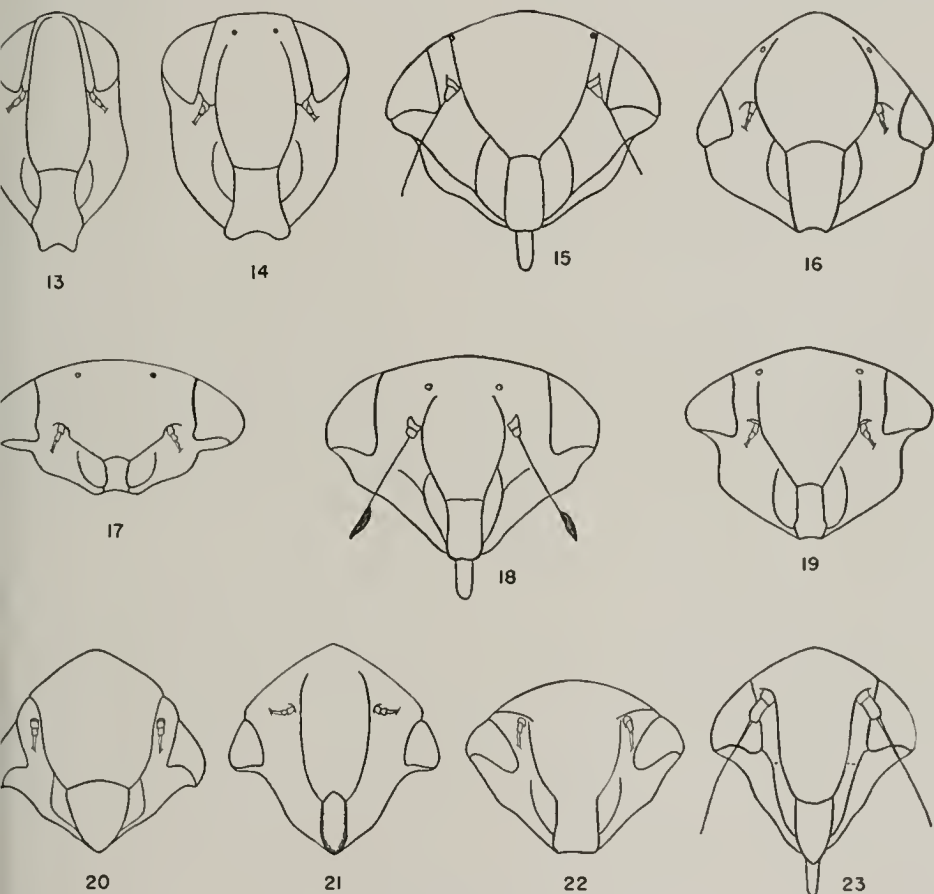
KEY TO SUBFAMILIES

- 1. Frons long and nearly parallel sided or a little narrowed dorsad, figs. 13, 14; eyes large and separated on meson by less than greatest width of eye, fig. 24. . . . . **Jassinae**, p. 343
- Frons expanding dorsad, as in figs. 15, 16; eyes smaller and usually separated on meson by one or more times width of eye. . . . . 2

- 2. Vertex between eyes very short and from 5 to 13 times wider than median length, as in figs. 26, 29; ocelli on extreme front margin of vertex or on face, as in figs. 17, 18. . . . . 3
- Vertex between eyes generally long and 2 to 4 times wider than median length, as in figs. 28, 31; ocelli above, or on front margin of vertex, or absent, as in figs. 27, 31. . . . . 9
- 3. Anterior margin of pronotum extended beyond a line through the anterior margins of eyes, as in fig. 26. . . . . 4
- Anterior margin of pronotum not extended beyond anterior margins of eyes, as in figs. 27, 29. . . . . 6
- 4. Frontal suture extending beyond antennal pit and curved on inside of ocellus, fig. 16; veins of elytra each with a double row of punctures on margins, fig. 95. . . . . **Nioninae**, p. 131
- Frontal suture ending at or near antennal pit, figs. 92, 93; veins of elytra without punctures. . . . . 5
- 5. Vertex obtusely angulate, fig. 26; anterior margin of pronotum produced from one-third to nearly one-half its length beyond anterior margins of eyes; head and pronotum punctured or with irregular raised lines. . . . . **Macropsinae**, p. 123
- Vertex broadly rounded, figs. 96, 104; anterior margin of pronotum produced not more than one-fifth or one-sixth its length beyond anterior margins of eyes; head and pronotum finely granulate. . . . . **Agalliinae**, p. 132
- 6. Frontal suture extending beyond antennal pit nearly to ocellus, as in fig. 19; head wider than pronotum; elytra bare between veins. . . . . 7
- Frontal suture ending at antennal pit, as in fig. 17. . . . . 8

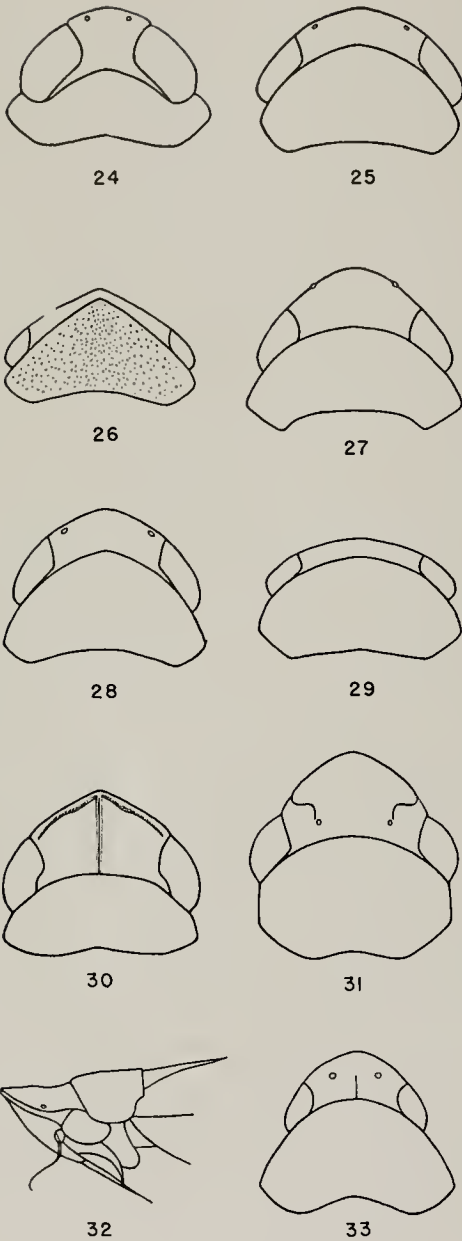
7. Body large and robust, the elytra inflated behind; ocellus, fig. 19, closer to eye than middle of vertex and directly above antennal base. The genus *Remadosus* in . . . **Athysaninae**, p. 181  
 Body slender, fig. 34, the elytra narrowed behind; ocellus, fig. 18, almost exactly halfway between eye and middle of vertex on inside of a perpendicular line through antennal base. . . . . **Eurymelinae**, p. 111
8. Head, fig. 29, narrower than pronotum; elytra with many short hairs between veins. . . . . **Bythoscopinae**, p. 138  
 Head, fig. 98, wider than pronotum; elytra bare. The genus *Aceratagallia* in . . . . . **Agalliinae**, p. 132
9. A median longitudinal carina on front and on vertex, and another extending from

- inner margin of eye to middle of front margin, fig. 30. . . **Evacanthinae**, p. 153  
 Carina absent on front and only occasionally present on vertex . . . . . 10
10. Ocelli on disc of vertex between eyes but remote from eyes and anterior margin, figs. 31, 33. . . . . 11  
 Ocelli, when present, on or near anterior margin of vertex, as in figs. 205, 206. . . . . 14
11. Each clavus without veins or stripes; terminal membrane of each elytron, fig. 152*B*, wide on inside and broadly overlapping at suture; body short and broad, with apex of elytra conspicuously sloping. . . **Penthimiinae**, p. 154  
 Each clavus with one or more distinct veins or veinlike dark stripes, as in figs. 128-130; terminal membrane on



Faces of Cicadellidae

- Fig. 13.—*Tinobregmus viridescens*.  
 Fig. 14.—*Jassus olitorius*.  
 Fig. 15.—*Chlorotettix unicolor*.  
 Fig. 16.—*Nionia palmeri*.  
 Fig. 17.—*Stragania apicalis*.  
 Fig. 18.—*Idiocerus lachrymalis*.  
 Fig. 19.—*Remadosus magnus*.  
 Fig. 20.—*Neokolla hieroglyphica*.  
 Fig. 21.—*Xerophloea major*.  
 Fig. 22.—*Ponana quadralaba*.  
 Fig. 23.—*Typhlocyba tunicarubra*.



Heads of Cicadellidae

- Fig. 24.—*Jassus olitorius*.
- Fig. 25.—*Nesosteles neglectus*.
- Fig. 26.—*Macropsis viridis*.
- Fig. 27.—*Xestocephalus pulicarius*
- Fig. 28.—*Balclutha abdominalis*.
- Fig. 29.—*Stragania apicalis*.
- Fig. 30.—*Evacanthus acuminatus*.
- Fig. 31.—*Neokolla hieroglyphica*.
- Fig. 32.—*Aphrodes nervosus* ♀.
- Fig. 33.—*Gyponana octolineata*.

- inner margin of each elytron at apex narrow, and at most only narrowly overlapping; body more elongate.....12
- 12. Frontal sutures extending over anterior margin of vertex nearly to ocelli, figs. 20, 31; margin of vertex very blunt and broadly rounded to front, or bulbous..... **Tettigoniellinae**, p. 139
- Frontal sutures terminating below anterior margin of front, as in figs. 21, 22; margin of vertex not more than slightly thickened, sometimes thin and foliaceous.....13
- 13. Clypeus, fig. 21, small, oval, very convex; antennal pit with a slight rounded convexity in front; dorsum, fig. 182, nearly uniformly covered with deep rounded pits..... **Ledrinae**, p. 169
- Clypeus, fig. 22, larger, parallel sided, slightly convex; antennal pit with a distinct transverse sharp ridge above, reaching eye; body not pitted though shallowly punctured along veins..... **Gyponinae**, p. 155
- 14. Elytra, fig. 403, short and broadly rounded, exposing five or more abdominal segments; nearly all veins, if distinct, reaching apical margin and usually without closed cells on disc before elytral apex, as in fig. 237..... **Athysaninae**, p. 181
- Elytra long, as in fig. 229, and exposing at most the tip of abdomen; at least two or more distinct cells on disc of each elytron, as in figs. 200, 230.....15
- 15. Elytral nervures usually not branching on disc and without crossveins anterior to apical crossveins, figs. 490-499; ocelli often absent; lorae usually long and narrow, fig. 23..... **Cicadellinae**, p. 349
- Either elytral nervures branching on the disc, or crossveins present anterior to apical crossveins, figs. 211-230; ocelli usually present; lorae not especially elongated, fig. 15.....16
- 16. Ocellus distant from eye, located approximately half way between inner margin of eye and middle of front margin, fig. 27.....17
- Ocellus very close to eye at no more than one-third the distance between inner margin of eye and middle of front margin, and situated on front margin or only slightly behind, as in figs. 186A, 188.....20
- 17. Vertex raised in front of and above eye so that eye appears to be somewhat sunken in head, fig. 487..... **Neocoelidiinae**, p. 345
- Vertex not raised in front of or above eye, the vertex appearing to be nearly continuous with eye, as in fig. 25.....18
- 18. Margin of vertex bluntly to evenly rounded to face, fig. 197, and with ocelli situated on or appearing to touch extreme front margin when viewed from above, fig. 27.....19
- Vertex more angulate behind the front, and with ocelli a little behind front margin..... **Aphrodinae**, p. 178
- 19. Head narrower than pronotum, fig. 27:

apexes of elytra mottled brown. The genus *Nestocephalus* in . . . . .

**Aphrodinae**, p. 178

Head wider than pronotum, fig. 463; apexes of elytra not mottled brown, though often dark with light veins. The genus *Cicadula* in . . . . .

**Athysaninae**, p. 181

20. Vertex produced, anterior margin thin, sharp, and foliaceous, figs. 186-190 . . . . .

**Dorydiinae**, p. 170

Vertex often flattened and acutely angled but rarely thin, sharp, and foliaceous on entire margin, figs. 200, 210 . . . . . 21

21. Inner sector of forewing twice forked, forming three anteapical cells, fig. 214; hind wing with four apical cells . . . . .

**Athysaninae**, p. 181

Inner sector of forewing not forked, with two anteapical cells, fig. 213; hind wing with three apical cells . . . . . 22

22. Head distinctly narrower than pronotum, or, if as wide, then with vertex broad, almost parallel margined, scarcely produced at middle, and without definite color markings, figs. 28, 488 . . . . .

**Balcluthinae**, p. 346

Head as wide as or wider than pronotum, figs. 469, 472; vertex produced at middle, usually bluntly angled, marked with black spots or broken transverse bands . . . . . **Athysaninae**, p. 181

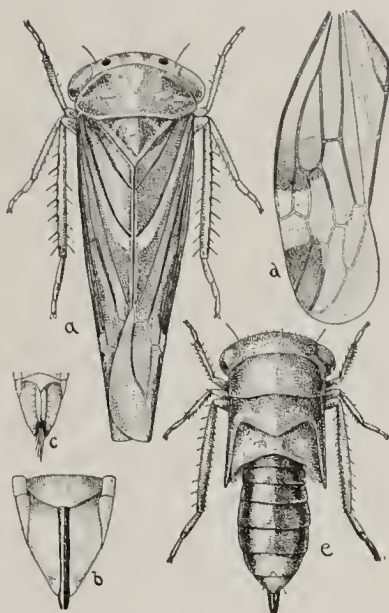


Fig. 34.—*Idiocerus fitchi*: a, adult; b, female genitalia; c, male genitalia; d, elytron; e, nymph. (From Osborn.)

Subfamily EURYMELINAE

The members of this subfamily are wedge shaped in appearance and have short broad vertexes that are rounded to the front; the ocelli are on the face. Each of the forewings has a large and distinct appendix.

This group is represented in the United States by only one genus, *Idiocerus*.

**1. IDIOCERUS** Lewis

*Idiocerus* Lewis (1835, p. 47).

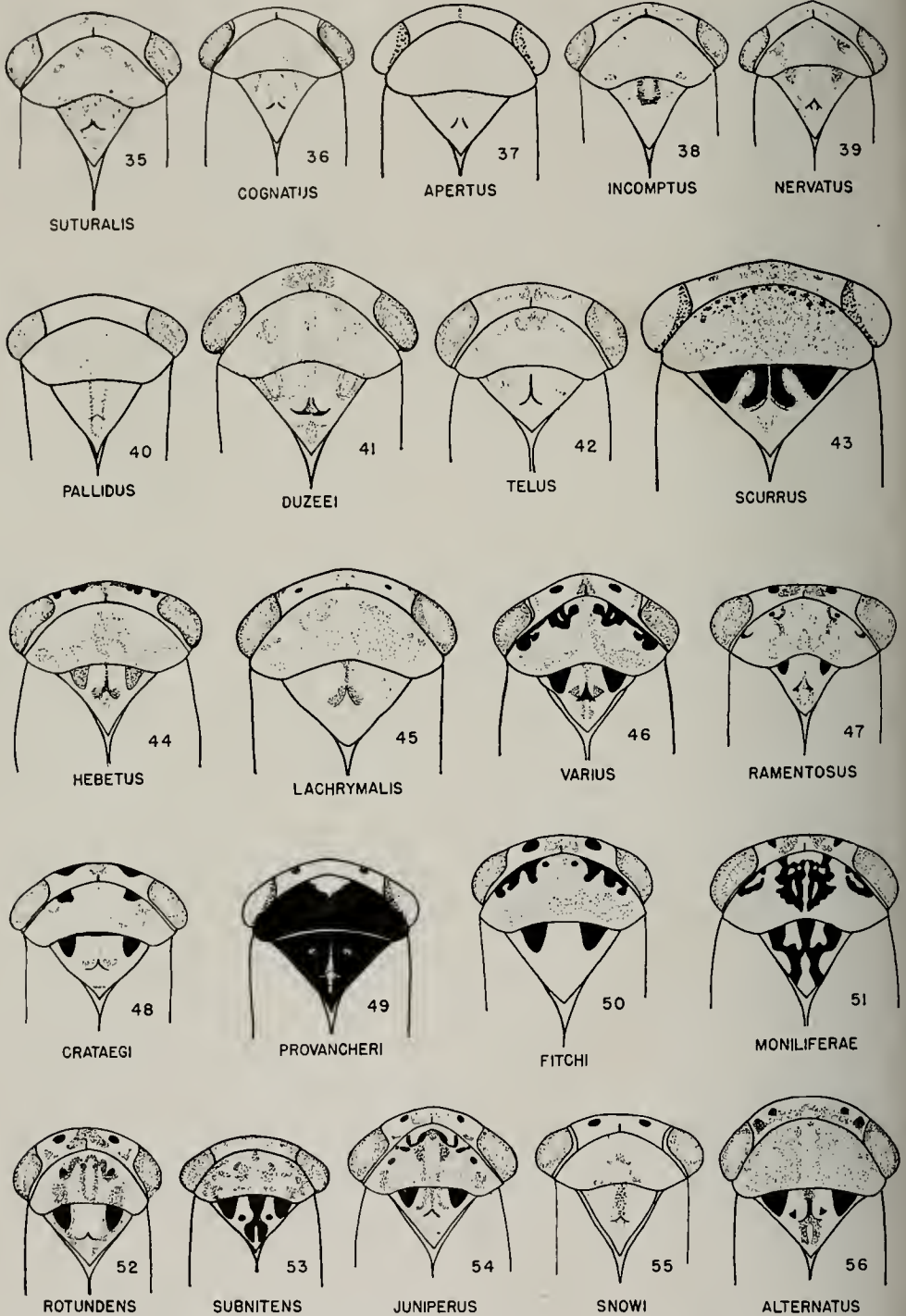
Fig. 34. Head short, broader than pronotum. Vertex short, parallel margined, and broadly rounded to front. Male antennae frequently bearing characteristic discs near their apexes. Elytra usually longer than abdomen, narrow, each with a distinct appendix, narrowly rolled or folded at apex.

So far as is known this group is entirely tree or shrub inhabiting, and the greater number of species occur on willow, poplar, aspen, and species of *Crataegus*. About 75 species and varieties occur in the United States; 17 have been collected in Illinois.

KEY TO SPECIES

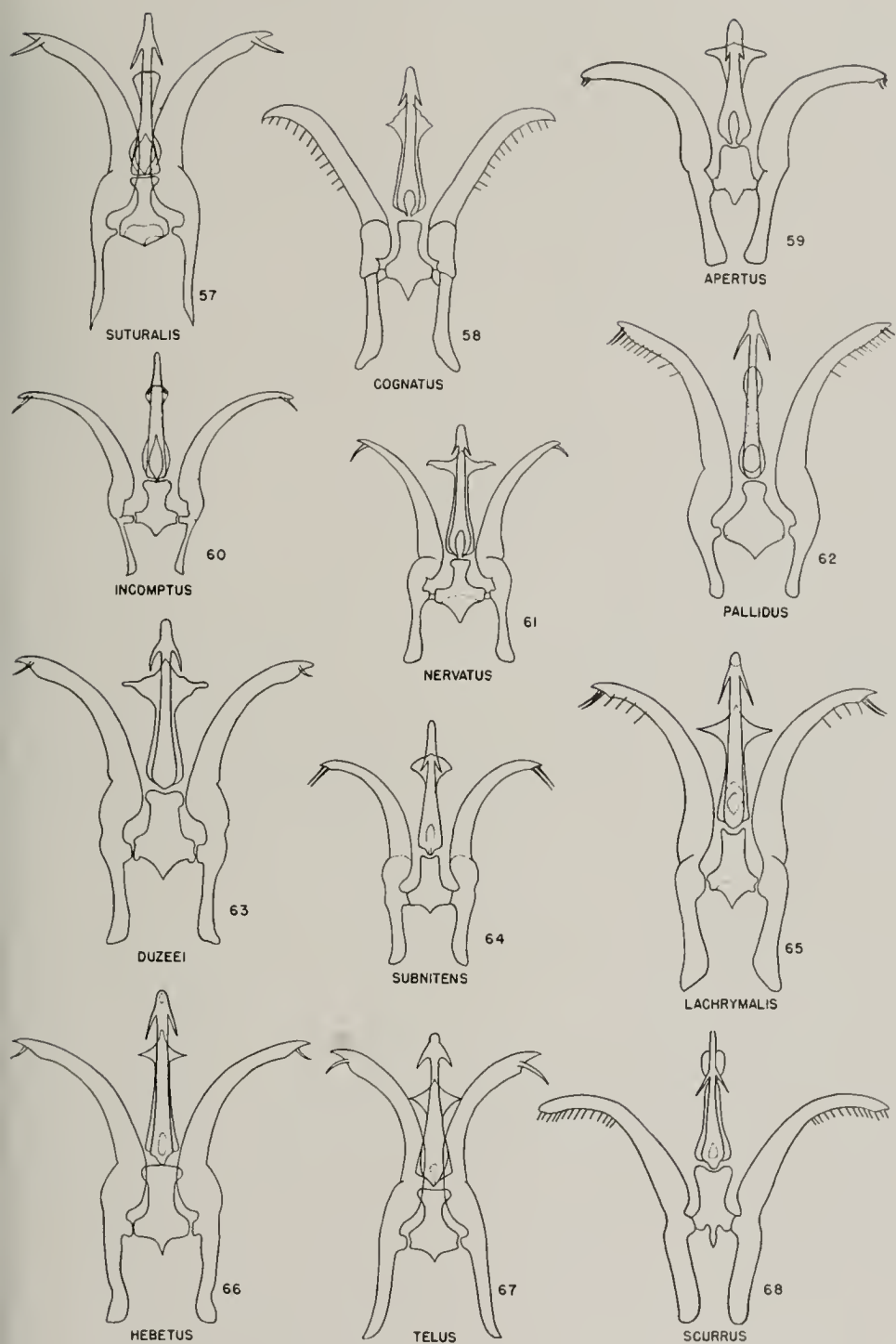
1. Vertex without definite round black spots on margin, figs. 35-45. . . . . 2

- Vertex marked with two or more round black spots on margin, figs. 46-56 . . . . . 12
- 2. Pale yellow or green, with a broad fuscous stripe arising on scutellum, fig. 35, and extending along inner margins of elytra to apex of clavus, often broken or interrupted . . . . . **1. suturalis**
- Green, yellow, or brown, but without a stripe along inner margins of elytra . . . . . 3
- 3. Length not exceeding 5.0 mm. . . . . 4
- Length 5.5 mm. or more . . . . . 7
- 4. Pronotum and scutellum irrorate, fig. 37; elytra fuscous, costal margins white . . . . . **3. apertus**
- Pronotum and scutellum not irrorate, elytra not fuscous; color pale green or yellow . . . . . 5
- 5. Elytra pale, faintly banded by pale bronze or fuscous transverse bands; each male antenna simple . . . . . **2. cognatus**
- Elytra pale, not banded or marked; each male antenna with small disc . . . . . 6
- 6. Dorsal portion of aedeagus, fig. 60, terminating in a small narrow rounded process . . . . . **4. incomptus**
- Dorsal portion of aedeagus, fig. 61, transverse, with lateral pointed processes widely produced . . . . . **5. nervatus**
- 7. Elytra green or iridescent gold, not marked with brown . . . . . 8
- Elytra brown, with pale markings, or pale, with brown markings . . . . . 10
- 8. Elytra white or pale green; each male antennal disc elongate, ovate . . . . . 9
- Elytra iridescent gold; each male antennal disc broader, elongate, subovate . . . . . **7. duzeii**



Figs. 35-36.—*Idiocerus*, head, pronotum, and scutellum. Color patterns and shapes of typical representatives of 22 species are shown.

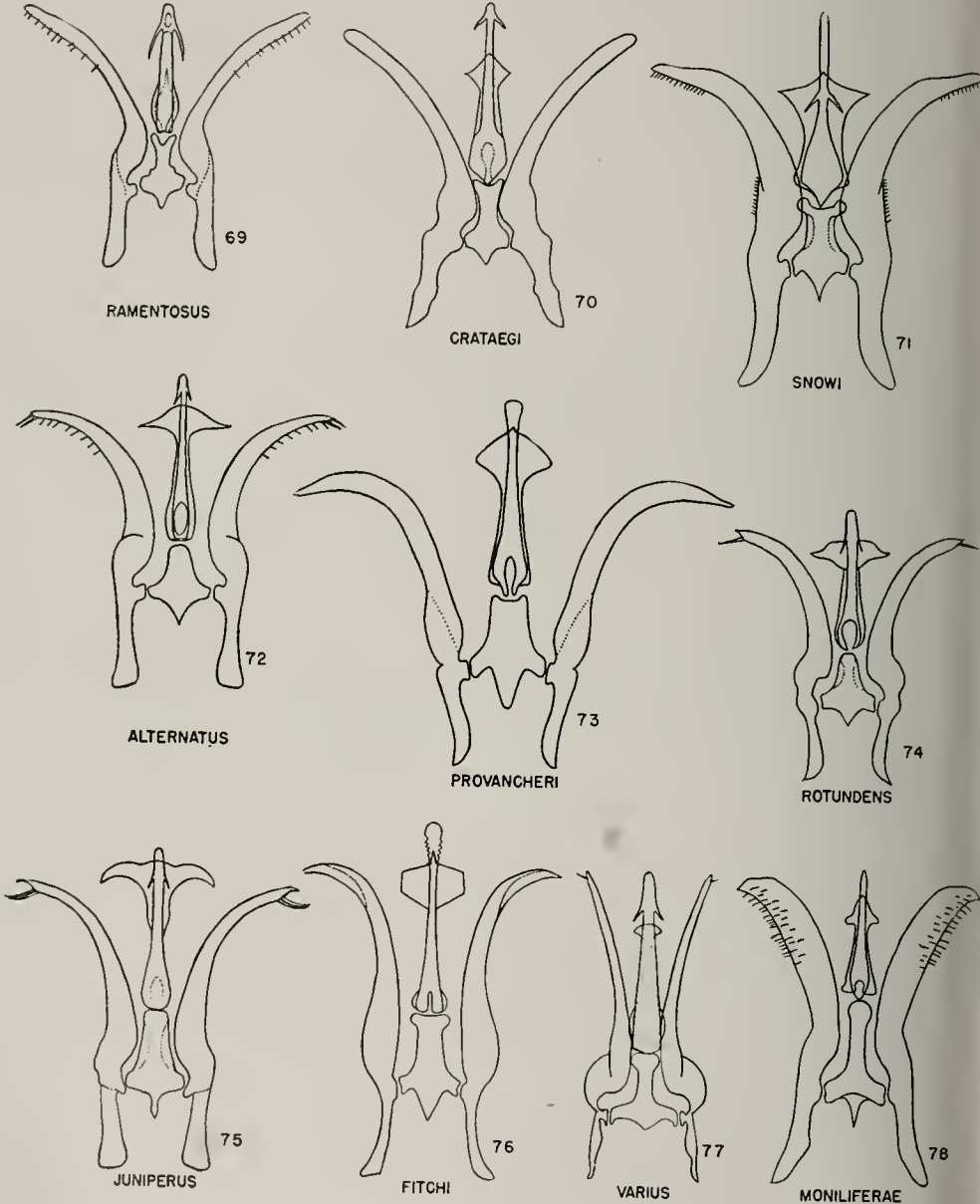




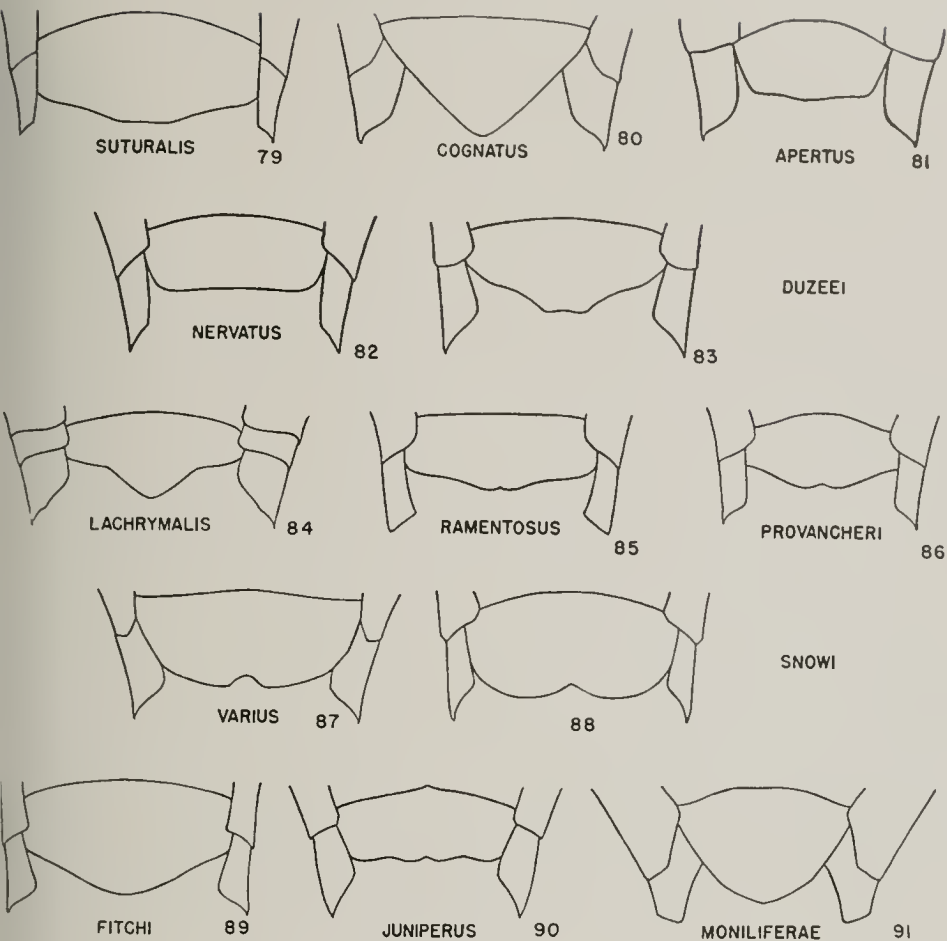
Figs. 57-68.—*Idiocerus*, male genitalia.

- 9. Dorsal portion of aedeagus, fig. 62, narrow and rounded at apex; spines at terminus of ventral portion long, not webbed to aedeagus shaft.....6. **pallidus**
- Dorsal portion of aedeagus, fig. 67, terminating in a broad diamond-shaped process; spines at the terminus of ventral aedeagus process appearing webbed to aedeagus shaft.....8. **telus**
- 10. Elytra brown, with pale spots on veins, especially on each clavus; each male

- antenna simple, without disc. .... 9. **scurrus**
- Elytra white, veins marked with brown; each male antennal disc large, elongate, and black..... 11
- 11. Pale, without conspicuous dark markings, fig. 44; each style, fig. 66, with one prominent spine at apex; diamond-shaped terminus of dorsal aedeagus process small..... 10. **hebetus**
- Usually with darker conspicuous color



Figs. 69-78.—*Idiocerus*, male genitalia.



Figs. 79-91.—*Idiocerus*, female seventh sternite.

- markings; each style, fig. 65, with two prominent proximal parallel spines at apex; diamond-shaped terminus of dorsal aedeagus process large, conspicuous, . . . . . **lachrymalis** (see 10. *hebetus*)
12. Elytra marked with a white transverse band at apex of each clavus . . . . . **11. subnitens**  
Elytra often mottled but without a white transverse band at apex of each clavus. . . . . 13
13. Vertex marked by a transverse brownish band variously intensified, as in figs. 44, 45, frequently enclosing the round black spots. . . . . 14  
Vertex without a transverse brown or black band . . . . . 15
14. Pale, without conspicuous dark markings; style, fig. 66, with one prominent spine at apex; diamond-shaped terminus of dorsal aedeagus process small . . . . . **10. hebetus**  
Usually with darker conspicuous color markings; style, fig. 65, with two prominent proximal parallel spines at apex; diamond-shaped terminus of dorsal aedeagus process large, conspicuous . . . . . **lachrymalis** (see 10. *hebetus*)
15. Black spots on vertex large, appearing proximal to eyes . . . . . 16  
Black spots on vertex not more than half as large, often very small, appearing more distant from eyes . . . . . 19
16. Color rather uniform, pale or dull brown, without markings; elytra brownish hyaline, veins often darker . . . . . **12. ramentosus**  
Color not uniform, but pale brown marked with black and yellow, or dark brown, with pale markings. . . . . 17
17. Dirty yellow to pale gray; a pair of black spots on anterior margin of pronotum, fig. 48; basal angles of scutellum black; elytra pale, subhyaline, veins brown . . . . . **13. crataegi**  
Dark brown or chestnut brown, pronotum and scutellum with pale markings . . . . . 18
18. Basal two-thirds of elytra entirely white,

- tinted with yellow except for a broad black band on inner margin next to scutellum; scutellum, fig. 49, nearly uniform chestnut brown. . . . .
14. **provancheri**  
Basal portion of each clavus pale brown, with darker veins and a small white spot at apex of second claval vein; scutellum, fig. 50, mostly brown, lateral and apical portions white. . . . .
15. **fitchi**  
19. Elytra marked by two faint transverse bronze or pale brownish bands. . . . .
2. **cognatus**  
Elytra marked with dark brown and without definite bands. . . . . 20
20. Veins concolorous or uniform yellowish; body pale in color. . . . . 21  
Veins alternately white and dark brown; body darker in color. . . . . 22
21. Length 5.25–5.75 mm.; usually with a narrow brown stripe extending along claval portion of inner margins of elytra; each male antenna without disc. . . . .
16. **snowi**  
Length not exceeding 5.0 mm.; basal angles of scutellum, fig. 52, with brown triangular spots, but without markings on elytra; each male antenna with large oval disc. . . . .
17. **rotundens**  
22. Brownish in color; veins alternately brown and white, not conspicuously marked; each male antennal disc elongate, black. . . . . 23  
Darker brown, more heavily marked on vertex, pronotum, scutellum, and elytra, fig. 51; veins broadly, heavily, and more conspicuously marked with alternating brown and white areas; each male antenna simple, without disc. . . . .
21. **moniliferae**  
23. Dorsal process of aedeagus, fig. 77, small, rounded at apex, scarcely broader than ventral aedeagus shaft. . . . .
18. **varius**  
Dorsal process of aedeagus broad, terminal processes laterally pointed or hooked, as in figs. 72, 75. . . . . 24
24. Dorsal aedeagus process, fig. 75, with lateral terminal portions bent anteriorly, gradually curved concavely on anterior margin to median shaft. . . . .
19. **apache** var. **juniperus**  
Dorsal aedeagus process, fig. 72, with lateral terminal projections sharp pointed and straight, abruptly narrowed anteriorly to shaft of aedeagus. . . . .
20. **alternatus**

### 1. *Idiocerus suturalis* Fitch

*Idiocerus suturalis* Fitch (1851, p. 59).

Fig. 35. Length 5.0–5.75 mm. Pale yellow, with a dark brown stripe along the suture of elytra, this sometimes interrupted, but often continuing to scutellum and pronotum. Vertex unmarked. Elytra yellowish hyaline, apexes smoky. Male antennal discs elongate, black. Female seventh sternite, fig. 79, with posterior margin rather

strongly and roundedly produced. Male plates narrow and elongate. Each style, fig. 57, tapered on anterior margin just before apex, with a single apical spine; ventral portion of aedeagus with rather long slender barbs at base of the terminal head; dorsal portion of aedeagus rounded at base and apex, constricted at middle, the apical portion gradually broadened to about three times the width of the shaft, the apical margin broadly rounded.

This species is widely distributed in the eastern United States, and ranges west to Colorado. It has been taken from willow, poplar, and birch.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, DeLong & Ross, 1 ♂; June 29, 1935, DeLong & Ross, 1 ♂, 2 ♀. GALENA: July 8, 1917, 1 ♀; June 20, 1932, Dozier & Mohr, 2 ♂; July 10, 1934, DeLong & Ross, 4 ♂, 5 ♀. GRAND DETOUR: July 2, 1932, Dozier & Mohr, 1 ♀. MCHENRY: July 31, 1884, 1 ♀. OAK LAWN: Aug. 24, 1933, Frison & Ross, 6 ♀. PUTNAM: July 6, 1934, Ross & DeLong, 1 ♀.

### 2. *Idiocerus cognatus* Fieber

*Idiocerus cognatus* Fieber (1868, p. 455).

Fig. 36. Length 4.5–5.0 mm. Pale, appearing faintly banded. Female usually with two small but well-defined black spots on vertex. Male with spots often faint or wanting. Face pale, with a central spot above extending on to vertex, with the small black spots either side. Pronotum pale gray with margins lighter, yellowish. Scutellum pale brown. Each elytron pale, subhyaline, veins of apical fourth brown, a brownish band at middle formed by a brownish coloration on veins. Each male antenna simple. Female seventh sternite, fig. 80, slightly but broadly and roundedly produced. Male plates elongate, narrow. Each style, fig. 58, rather broad and uniform in width throughout apical half, pointed at apex; ventral portion of aedeagus with a headlike structure, at the base of which is a pair of short barblike spines; dorsal portion of the aedeagus broadened and pointed on each lateral margin and bluntly pointed at apex.

This species has been found commonly in the eastern United States on *Populus alba*.

**Illinois Record.**—URBANA: Aug. 16, 1934, DeLong & Ross, 3 ♂.

### 3. *Idiocerus apertus* DeLong & Hershberger

*Idiocerus apertus* DeLong & Hershberger (1947, p. 46).

Fig. 81. Length, male 4.5 mm. In form and general appearance similar to *nervatus*, but pale brownish in color. Vertex, fig. 37, broadly rounded, a little shorter at middle than next to eyes; yellowish, tinted with brown, the central portion brownish. Disc of pronotum, basal angles of scutellum, and basal portions of elytra tinted with brown. Elytra subhyaline, with pale brownish veins. Male plates elongate, rather narrow, apices broadly rounded. Styles, fig. 59, strongly curved outwardly, apex of each bluntly pointed and bearing a pair of conspicuous spines; aedeagus with ventral portion forming a slightly enlarged apical head that has a barbed spine at base on either side; dorsal portion not quite so long as ventral and broadened at apex to form a pointed protrusion at either side and a broad slightly produced apical margin.

This species probably occurs in the southern portion of the state. It has been collected in Tennessee.

### 4. *Idiocerus incomptus* DeLong & Hershberger

*Idiocerus incomptus* DeLong & Hershberger (1947, p. 45).

Fig. 38. Length 4.5 mm. Resembling *nervatus* in form and coloration, but with distinct male genitalia. Color pale green to yellow green, without markings except pale brownish spots on basal angles of scutellum. Elytra subhyaline, with pale veins. Dark veins of under wings conspicuous from above. Face pale, slightly infuscated above. Each antennal disc slightly enlarged, elongate, black at apex. Male plates elongate, rather narrow, apices broadly rounded; each style, fig. 60, rather narrow and tapered about two-thirds of its length to form pointed apex, which bears a large spine; ventral portion of aedeagus only slightly narrowed from base to apex, the latter rounded and bearing a short spine on either side about one-fifth the distance from apex; dorsal portion of aedeagus constricted at middle, forming a rounded portion at base, which is distinctly wider than the ventral process, and also forming a smaller rounded portion just slightly wider than the ventral

process at apex; terminal rounded portion ending just anterior to spines of ventral process.

**Illinois Record.**—HORSESHOE LAKE: cypress, July 11, 1935, DeLong & Ross.

### 5. *Idiocerus nervatus* Van Duzee

*Idiocerus nervatus* Van Duzee (1894b, pp. 194, 205).

Fig. 39. Length 4.0–4.5 mm. Small, pale green, without dark markings on vertex. Basal angles of scutellum brown, and the brown nervures of the wings conspicuous through the pale greenish hyaline elytra. Each male antenna with small disc. Female seventh sternite, fig. 82, with posterior margin broadly truncate. Male plates long and narrow. Each style, fig. 61, gradually tapered on apical half to rather narrow apex and bearing a single prominent spine; ventral aedeagus bearing a headlike portion with a pair of very short barblike spines at base; dorsal aedeagus portion abruptly broadened at apex to form a short broad process pointed on each lateral margin and bluntly pointed at apex.

This species occurs on willows with *pallidus*, which it closely resembles. It can be distinguished by its smaller size and the dark basal angles of scutellum. It is widely distributed in the eastern United States and the Middle West and ranges west into Arizona and California.

**Illinois Records.**—Many males and females, taken March 24 to October 2, are from Algonquin, Alto Pass, Apple River Canyon State Park, Ashley, Carlinville, Cave in Rock, Chemung, Dongola, Fountain Bluff, Fox Lake, Geff, Gibsonia, Golconda, Havana, Herod, Horseshoe Lake, Jonesboro, Kampsville, Kankakee, Meredosia, Mount Carmel, Onarga, Oquawka, Paxton, Putnam, Quincy, Rock Island, Starved Rock State Park, Urbana, White Heath, and Zion.

### 6. *Idiocerus pallidus* Fitch

*Idiocerus pallidus* Fitch (1851, p. 59).  
*Bythoscopus obsoletus* Walker (1851a, p. 873).

Fig. 40. Length 6.0–6.5 mm. White, tinged with green, unmarked, elytra subhyaline, nervures indistinct. Eyes reddish brown; antennal discs large. Female seventh sternite broadly and roundedly produced,

the central portion produced beyond rounded margin. Male plates slender and elongate. Each style, fig. 62, slightly narrowed on apical third, rather abruptly narrowed at apex and pointed at tip; ventral aedeagus with a slightly enlarged apical head, at the base of which is a pair of long slender spines; dorsal aedeagus rounded at base and apex and constricted at middle; apical portion only slightly wider than aedeagus shaft.

This is the common species of leafhopper on willow and poplar, and it is transcontinental in distribution.

**Illinois Records.**—ALGONQUIN: July 12, 1895, 1 ♂; July 19, 1895, 1 ♂; July 23, 1895, 2 ♂; July 26, 1895, 1 ♂; Aug. 12, 1895, 1 ♂; July 17, 1896, 3 ♂, 2 ♀. NIOTA: dry bog, July 28, 1936, Mohr & Burks, 1 ♀.

#### 7. *Idiocerus duzeei* Provancher

*Idiocerus duzeei* Provancher (1890, p. 292).  
*Idiocerus perplexus* Gillette & Baker (1895, p. 78).

Fig. 41. Length 6–7 mm. Resembling *pallidus*, but larger, broader, and pale yellowish green, the elytra golden iridescent, apexes fuscous. The coloration at apexes of elytra more pronounced in male than in female. Male antennal discs elongate ovate. Female seventh sternite, fig. 83, with posterior margin concavely rounded to a produced, broadly rounded median third. Male plates elongate and narrow. Each style, fig. 63, rather broad, slightly narrowed between apical portion and middle, apex abruptly narrowed to pointed tip and bearing a single spine; ventral aedeagus portion with a slightly enlarged head, which has a pair of rather long basal spines; dorsal aedeagus portion greatly enlarged at apex and angularly pointed laterally on each side and at apex.

A common species on cottonwood, *duzeei* occurs in the eastern United States and west to Colorado. It is widely distributed throughout Illinois and probably occurs wherever its host is found.

**Illinois Records.**—Males and females, taken June 14 to August 2, are from Alton, Cache, Elizabeth, Elizabethtown, Freeport, Galena, Grafton, Havana, Kampsville, Niota, Normal, Olive Branch, Pike, Putnam, Vienna, Volo, Wauconda, and White Heath.

#### 8. *Idiocerus telus* DeLong & Hershberger

*Idiocerus telus* DeLong & Hershberger (1947, p. 45).

Fig. 42. Length 5 mm. Resembling *pallidus* in form and appearance, but differing in the male genitalia. White, tinged with green, without dark margins, basal angles of scutellum yellowish. Elytra subhyaline, veins tinted with green. Face pale. Antennal discs large, black, ovate. Male plates elongate, rather narrow. Each style, fig. 67, slightly broadened near apex, then rapidly narrowed, and bearing a prominent spine just before pointed apex; ventral portion of aedeagus tapered from base to apical fifth, which is broadened by a pair of prominent spines that are webbed to the main aedeagus shaft; these spines slope almost to a blunt apex, giving the head portion a triangular appearance; dorsal portion shorter and constricted at middle between a rather broad base and a broader diamond-shaped apex, the last with pointed apical margin, and a broad pointed lateral margin on each side.

**Illinois Record.**—PIKE: June 28, 1934, DeLong & Ross, 2 ♂.

#### 9. *Idiocerus scurrus* (Germar)

*Jassus scurra* Germar (1834, pl. 11).  
*Jassus crenatus* Germar (1834, pl. 10).  
*Idiocerus germari* Fieber (1868, p. 451).  
*Idiocerus gemmisimulans* Leonard & Crosby (1915, p. 542).

Fig. 43. Length 6–7 mm. Large, robust, brownish or brownish gray, variously marked with dark brown or black, but without definite spots on vertex. Face pale, usually with a dark, often broken, band on upper portion between eyes. In well-marked specimens the basal angles of the scutellum are black. Veins of elytra alternately yellow and brown, appearing raised and conspicuous. Central claval vein on inner margin of each elytron always yellow at apex. Seventh sternite of female roundedly produced and slightly notched at middle. Male plates narrow and elongate. Each style, fig. 68, somewhat narrowed on apical third, without long apical spine; ventral portion of aedeagus bearing a pair of long spines one-third the distance from apex, not enlarged at apex; dorsal portion of aedeagus tapered toward apex, then constricted, beyond which it is enlarged to form a large rounded apical portion.

This European species, which has been recorded from New York, has been taken from Lombardy poplar.

**Illinois Record.**—URBANA: Sept. 1-9, 1944, Hasbrouck, 1 ♀.

10. *Idiocerus hebetus* DeLong & Hershberger

*Idiocerus hebetus* DeLong & Hershberger (1947, p. 48).

Fig. 44. Length 6-7 mm. Resembling *lachrymalis* Fitch (1851, p. 58) in form and appearance, but paler in color and with distinctive male genitalia. Face pale, ocelli dark. A broken dark brown band on margin of vertex forming a dark spot next to each eye, and a band produced upward on each end to include a round spot like that on *lachrymalis*. Pronotum cream to dark gray, median anterior portion pale brown. Scutellum white to cream, basal angles brown, a transverse line at middle brown. Each elytron brownish subhyaline, darker on anterior half of clavus and apical portion. Male antennal discs narrow, elongate, black. Male plates elongate and rather narrow. Styles, fig. 66, each rather broad and only slightly tapered to region near apex, then pointed and bearing a prominent spine; ventral portion of aedeagus stout, with a pair of rather long basally directed spines just before apex; dorsal portion of aedeagus broader at base than ventral portion, narrowed, then broadened at apex to form a diamond-shaped tip with a pointed apex, lateral margins sharply angled.

This species can easily be distinguished from *lachrymalis*, a western species which has been confused with it in the past, by the paler, more uniform color, the smaller diamond-shaped terminus of the dorsal aedeagus, and the single instead of double spines at apex of each style. For purposes of comparison, *lachrymalis* is illustrated in figs. 45, 65, 84.

**Illinois Records.**—GALENA: July 10, 1934, DeLong & Ross, 2 ♂, 3 ♀; June 28, 1935, DeLong & Ross, 1 ♂.

11. *Idiocerus subnitens* Sanders & DeLong

*Idiocerus subnitens* Sanders & DeLong (1917, p. 82).

Fig. 53. Length 6 mm. Resembling *lachrymalis* in coloration but smaller and nar-

rower. Vertex with broad black band between eyes and with round black spot either side above band and not far from eyes. Pronotum with dark markings, especially noticeable at lateral margins. Scutellum with black basal angles, a central Y-shaped black line with the bifurcate portion at apex, and a round black spot at either side on disc; each elytron smoky, nervures brown except for a white transverse band at apex of clavus. Female seventh sternite with posterior margin roundedly produced. Male plates narrow, elongate. Styles, fig. 64, tapered and narrowed on apical third, each bearing two long prominent spines at apex; ventral portion of aedeagus with an elongate rather narrow head portion bearing a pair of rather short spines at base; dorsal aedeagus portion broadened, tanlike at apex, considerably wider than aedeagus shaft, and with a broadly rounded apex.

This species has been taken only in small numbers from poplar in the more northern regions of the eastern United States. It has not been recorded from Illinois but is known to occur in Wisconsin.

12. *Idiocerus ramentosus* (Uhler)

*Bythoscopus ramentosus* Uhler (1877, p. 465).

*Idiocerus mimicus* Gillette & Baker (1895, p. 76).

*Idiocerus brunneus* Osborn & Ball (1898, pp. 72, 129).

Fig. 47. Length 4-5 mm. Broad, robust, cinnamon brown in color, with two black spots margined with yellow on vertex; an interrupted line below spots. Face tawny. Pronotum and scutellum brown. Elytra brown, subhyaline, nervures dark brown, tuberculate. Male antennal discs slightly elongate. Female seventh sternite, fig. 85, with posterior margin broadly and roundedly produced. Male plates elongate and narrow. Styles, fig. 69, rather narrow, each broadest at about one-fourth of the distance from apex, which is bluntly pointed and without long spines; ventral aedeagus slightly enlarged at apex, with a pair of long spines at base of enlargement and not far from apex; dorsal aedeagus rounded at base, narrowed to a slender shaft, which is not enlarged at apex.

This is one of the willow species occurring in the Mississippi River valley and westward to Colorado.

**Illinois Records.**—Males and females, taken May 6 to October 1, are from Alton,

Byron, Elizabethtown, Fulton, Grafton, Havana, Homer, Kampsville, Lima, Meredosia, Pike, Putnam, Quincy, Rock Island, Savanna, Seymour, and Topeka.

### 13. *Idiocerus crataegi* Van Duzee

*Idiocerus crataegi* Van Duzee (1890b, p. 110).

Fig. 48. Length 4.75–5.25 mm. Gray, with a pair of black spots on anterior margin of vertex, on pronotum, and on scutellum, these three pairs of spots arranged in two longitudinal rows; in addition, a pair of small approximate spots on disc of scutellum, a pair beneath ocelli, and a more elongate pair beneath the antennae. Elytra greenish brown, nervures dark. Female seventh sternite almost triangular, apex slightly and angularly notched. Male plates narrow and elongate. Each style, fig. 70, uniform in width on apical two-thirds and blunt at apex; ventral portion of aedeagus slender, scarcely enlarged at apex and bearing a pair of prominent spines near apex; dorsal aedeagus process broadened to about twice its width at apex; lateral portions angled and sharply pointed and apex pointed.

Recorded from Iowa, Missouri, and Colorado, *crataegi* is one of the common species on various types of *Crataegus*.

**Illinois Records.**—MONTICELLO: Sept. 22, 1934, Ross, 2 ♀. URBANA: July 9, 1920, 1 ♀; Sept. 6, 1934, DeLong and Ross, 2 ♂, 10 ♀.

### 14. *Idiocerus provancheri* Van Duzee

*Bythoscopus clitellarius* Provancher (1890, p. 288). Name preoccupied.

*Idiocerus provancheri* Van Duzee (1890b, p. 111). New name.

Fig. 49. Length 5.0–5.3 mm. Fulvous brown in color, with a broad yellow stripe on clavus. Vertex with two large black spots. Pronotum with pale spots only. Scutellum rufus. Costal margin of each elytron with hyaline spot before tip, a distinct bright yellow area from basal outer claval margin to just before apex of outer claval nervure. Female seventh sternite, fig. 86, rather strongly and rounded produced on posterior margin. Male plates elongate and narrow. Styles, fig. 73, strongly curved on apical third and each tapered to pointed apex; ventral portion of aedeagus constricted about one-third the distance from the apex and then slightly enlarged and blunt at apex;

ventral aedeagus enlarged at apex to form a broad fanlike structure, which is broadly and convexly rounded on apical margin.

Like *crataegi*, *provancheri* is common on *Crataegus* throughout the eastern United States.

**Illinois Record.**—MONTICELLO: June 11, 1934, Frison & DeLong, 3 ♂, 2 ♀.

### 15. *Idiocerus fitchi* Van Duzee

*Idiocerus maculipennis* Fitch (1851, p. 59). Name preoccupied.

*Idiocerus fitchi* Van Duzee (1909b, p. 383). New name.

Fig. 50. Length 5.25–5.75 mm. Brown, with narrow stripes on pronotum, scutellum, and clavus. Vertex with a pair of large black spots surrounded by broad yellow circles. Small crescents under the ocelli light yellow. Pronotum with a pair of black spots on the anterior margin; three spots on disc and posterior margin yellow. Scutellum with apex and margins pale yellow. Elytra brown, nervures darker, each elytron with a narrow light stripe on outer margin of clavus; costal margin broad and dark, interrupted by a hyaline band that crosses the apex and broadens on costa. Each antenna simple. Female seventh sternite, fig. 89, with posterior margin broadly and rounded produced. Male plates elongate and narrow. Styles, fig. 76, together lyrate in shape, narrowed on apical halves, curved outwardly and gradually narrowed to pointed apices; ventral aedeagus narrowed on middle half, apical portion clublike and rounded at apex.

An abundant species on *Crataegus* and often found on cultivated varieties of apple, *fitchi* occurs in the eastern United States and west to Iowa.

**Illinois Records.**—LUDLOW: Aug. 19, 1914, 1 ♀. MONTICELLO: June 11, 1934, Frison & DeLong, 4 ♂, 7 ♀. MUNCIE: July 5, 1914, 1 ♀. PROPHETSTOWN: July 7, 1925, T. H. Frison, 1 ♀. SHAWNEETOWN: June 14, 1934, Ross & DeLong, 1 ♂. URBANA: June 29, 1891, Hart & McElfresh, 1 ♂; July 5, 1891, Shiga, 1 ♂; June 23, 1892, Summers, 1 ♀; June 24, 1892, McElfresh, 1 ♂; June 25, 1892, 1 ♀; June 28, 1892, McElfresh, 1 ♀; Aug. 19, 1892, Hart, 2 ♀; Sept. 17, 1892, 1 ♀; July 9, 1920, 4 ♀; July 26, 1920, 1 ♀; Sept. 6, 1934, DeLong & Ross, 3 ♀. WHITE HEATH: July 5, 1916, 1 ♂, 2 ♀.



16. *Idiocerus snowi* Gillette & Baker

*Idiocerus snowi* Gillette & Baker (1895, p. 79).

Fig. 55. Length 5.25–5.75. Pale green, with two small round black spots on vertex and elytra, suture black. Face yellow, pronotum and scutellum unmarked. Elytra yellowish green, each with a dark brown stripe along the sutural margin from the apex of scutellum to the apex of clavus. Male antennae simple and without discs. Female seventh sternite, fig. 88, with posterior border convexly rounded, shallowly emarginate on median half. Male plates elongate and narrow. Each style, fig. 71, broad, apical fifth gradually narrowed to bluntly pointed apex, without long spines at apex; ventral aedeagus broad at base, narrowed and produced to form a long slender apical portion, with lateral spines almost half way from apex to base; dorsal process of aedeagus broad from base to apex and broadened on apical third to form a pointed lateral margin on each side; apical margin broad, slightly produced at middle and broadly pointed.

This species occurs on narrow-leaved willows and is common in the middle western states.

**Illinois Records.**—Many males and females, taken June 13 to September 27, are from Algonquin, Alton, Alto Pass, Apple River Canyon State Park, Arcola, Beardstown, Byron, Champaign, Chemung, Danville, Decatur, Des Plaines, Eichorn, Elizabethtown, Fox Lake, Fulton, Grafton, Grand Tower, Havana, Kampsville, Kankakee, Lawrenceville, Mason City, Mokenca, Neoga, Niota, Normal, Oak Lawn, Ogden, Oquawka, Ottawa, Pike, Princeton, Prophetstown, Putnam, Rock Island, St. Anne, Savanna, Seymour, Shawneetown, Starved Rock State Park, Topeka, Urbana, and Waukegan.

17. *Idiocerus rotundens* DeLong & Caldwell

*Idiocerus rotundens* DeLong & Caldwell (1937, p. 162).

Fig. 52. Length 4.5–6.0 mm. Pale yellow, with black ocelli. Vertex with a round median dusky area and a round black spot on either side. Scutellum marked only by black spots at base. Elytra white, veins to apical crossveins white, brownish beyond apical crossveins. Each antenna with large

circular terminal black disc. Female seventh sternite almost truncate on posterior margin, slightly produced, broadly rounded. Male plates narrow and elongate. Each style, fig. 74, slightly and gradually narrowed to pointed apex, bearing a single long spine; ventral aedeagus slender to apex, bearing a pair of prominent spines about one-fourth the distance from apex; dorsal portion of aedeagus enlarged at apex to form a rather broad process, the lateral margins of which are pointed, the posterior margin gradually sloping to the median two-thirds, which is truncate apically.

This is one of the small species occurring on willow. It has previously been recorded in the literature only from Wisconsin.

**Illinois Records.**—Many males and females, taken May 6 to October 31, are from Algonquin, Antioch, Ashley, Byron, Centerville, Champaign, Crescent City, Danville, Fox Lake, Freeport, Fulton, Grafton, Grand Tower, Grays Lake, Havana, Homer, Kampsville, Kankakee, Meredosia, Metropolis, New Holland, Niota, Oak Lawn, Oregon, Pike, Princeton, Putnam, Quincy, Rock Island, Seymour, Spring Grove, Waukegan, and Vienna.

18. *Idiocerus varius* DeLong & Hershberger

*Idiocerus varius* DeLong & Hershberger (1947, p. 46).

Fig. 46. Length 5.0–5.5 mm. Resembling *alternatus* in general coloration and appearance, but with distinctive male genitalia and large antennal discs. Face marked as in *alternatus*, with a large median dark area on upper portion extending across vertex. Vertex marked with an elongate brown spot next to each eye and a large round black spot not far from each eye just above margin. Pronotum brown, with heavy dark markings. Scutellum pale brown, with black spots in basal angles and a series of small connected black spots across middle. Elytra pale brownish subhyaline, veins dark brown, interrupted by white veins at the middle of each clavus and across elytron at apex of clavus. Male antennal discs broad, ovate, and black.

Female seventh sternite, fig. 87, slightly and roundedly produced posteriorly. Male plates elongate and narrow. Each style, fig. 77, long and slender and with a spine near apex; ventral portion of aedeagus rather

broad at base and tapered to form a rather narrowed head with a barblike spine either side about one-fourth the distance from apex; dorsal portion of aedeagus broad at base, constricted on median portion and narrow to apex, which is broadened to the width of the projecting spines on ventral portion; apex convexly rounded.

**Illinois Records.**—Many males and females, taken June 14 to July 16, are from Algonquin, Apple River Canyon State Park, Geff, Golconda, Grand Detour (Castle Rock), Karnak, Rock Island, Shawneetown, and Vienna.

19. *Idiocerus apache* var. *juniperus*  
DeLong & Hershberger

*Idiocerus apache* var. *juniperus* DeLong & Hershberger (1947, p. 46).

Fig. 54. Length 4.5–5.0 mm. Resembling *alternatus* in form and general appearance, but with larger antennal discs and distinctive genitalia. Face pale, lorae and genae with heavy brown longitudinal stripes. Upper portion of face with a large median dark area that extends across vertex as in *alternatus*. Vertex pale brown, with a round black spot on each side not far from eye and just above margin. Pronotum pale brown, tinted with gray and with dark brown markings on anterior portion. Scutellum cream to pale brown, black spots in basal angles and a broad longitudinal white stripe on apical half. Elytra brownish subhyaline, veins dark brown, interrupted by white portions at middle of each clavus and apex of clavus. Male antennal discs black, elongate, ovate. Female seventh sternite, fig. 90, scarcely produced posteriorly, almost truncate. Male plates elongate, rather narrow. Styles, fig. 75, tapered, apical half of each rather slender, bearing a pair of spines near apex on dorsal portion; ventral portion of aedeagus rather straight and slender, with a pair of short barblike spines a short distance from apex; dorsal portion of aedeagus broadened gradually, then abruptly to form a broad apex, which is slightly trilobate on apical margin and has broad but pointed lateral processes.

The typical *apache* Ball & Parker (1946, p. 76) is a western form, occurring in Arizona, Utah, and California.

**Illinois Records.**—**GOLCONDA:** June 22, 1932, Ross, Dozier, & Park, 1 ♀, 2 ♂. **HORSESHOE LAKE:** July 11, 1935, DeLong

& Ross, 1 ♂. **KAMPSVILLE:** June 27, 1934, DeLong & Ross, 1 ♂, 3 ♀. **MAHOMET:** April 30, 1936, Frison & Ross, 1 ♂. **URBANA:** April 6, 1900, 1 ♂.

20. *Idiocerus alternatus* Fitch

*Idiocerus alternatus* Fitch (1851, p. 59).  
*Idiocerus interruptus* Gillette & Baker (1895, p. 74).

Fig. 56. Length 5.0–5.25 mm. Brownish fuscous, marked with white on pronotum and elytra. Vertex usually marked with a brownish crescent outside the round spots. A light stripe on the middle of pronotum extending on to vertex and back across the scutellum. Basal angles and two spots on disc of scutellum black. Elytra subhyaline, nervures fuscous, interrupted with white, a large circular light spot covering the tips of the outer claval nervures and a smaller one at apex of each clavus. Male antennal discs black, slightly enlarged. Female seventh sternite slightly produced, almost truncate, slightly notched at middle. Male plates elongate and narrow; styles, fig. 72, gradually tapered to narrow pointed apices, each of which bears a pair of long spines; ventral aedeagus narrow and bearing a small short headlike structure at the base of which is a pair of short barblike spines; dorsal process of aedeagus abruptly broadened to form a transverse apical process, each lateral margin of which is sharp pointed; the apical margin curves convexly between the pointed lateral margins.

Transcontinental in distribution, this is one of the most abundant species occurring on willow.

**Illinois Records.**—**APPLE RIVER CANYON STATE PARK:** Aug. 22, 1935, DeLong & Ross, 1 ♀; July 16, 1936, Mohr, 2 ♂, 1 ♀. **GEFF:** June 12, 1934, DeLong & Ross, 1 ♂, 2 ♀. **GRAND DETOUR:** Castle Rock, July 12, 1934, DeLong & Mohr, 1 ♂. **HAVANA:** July 2, 1934, DeLong & Mohr, 2 ♂; Aug. 30, 1917, 1 ♂. **St. JOSEPH:** May 10, 1914, 1 ♂. **URBANA:** April 4, 1889, Marten, 2 ♂; April 4, 1908, 3 ♂, 1 ♀.

21. *Idiocerus moniliferae* Osborn  
& Ball

*Idiocerus moniliferae* Osborn & Ball (1898, pp. 71, 131).

Fig. 51. Length 5.5 mm. Resembling *alternatus* in coloration but a little larger.

more robust, and more distinctly marked. Margin of vertex marked with a broad transverse band between ocelli and spots on vertex. Front broad, a brown band on either side just inside anterior margin extending across just below the antennal pits. Elytra subhyaline, nervures alternately light and dark, bases of all nervures light, the cross nervures between the sectors broadly light. Each antenna simple and without disc. Female seventh sternite, fig. 91, rather strongly and roundedly produced. Male plates long and slender. Each style, fig. 78, especially broadened on apical half, apex pointed; ventral portion of aedeagus slender and produced apically; dorsal portion slightly and abruptly broadened near apex, forming an apical triangular head, the apex of which is bluntly pointed.

This species has previously been recorded from Iowa and Kansas.

**Illinois Records.**—KARNAK: June 23, 1932, Ross, Dozier, & Park, 1 ♀. LITCHFIELD: May 10, 1932, Ross & Mohr, 1 ♂. LUTHER: dry marsh, July 2, 1934, DeLong & Ross, 1 ♀. OAKWOOD: May 15, 1926, Auden, 1 ♀. URBANA: Aug. 6, 1890, at light, Hart & Shiga, 1 ♂.

Subfamily MACROPSINAE

The vertex is short but is obtusely angled anteriorly. The hind wing has three apical cells.

Two genera belong to this subfamily. *Macropsis* and *Oncopsis*, both of which occur in Illinois.

KEY TO GENERA

- Ocelli about midway between eyes and meson, fig. 93 . . . . . 2. *Macropsis*
- Ocelli about twice as far from meson as from eyes, fig. 92 . . . . . 3. *Oncopsis*

2. *MACROPSIS* Lewis

*Macropsis* Lewis (1835, p. 49).  
*Pediopsis* Burmeister (1838, pl. 10).

Figs. 26, 93, 94. Head almost or entirely deflexed, as wide as pronotum; vertex almost parallel margined, obtusely angulate. Lorae of female prominent, tumid; those of male often reduced and nearly obscured by the swollen and bulging clypeus. Pronotum distinctly angled anteriorly, produced beyond the anterior margins of the eyes; lateral margins very short, posterior margin

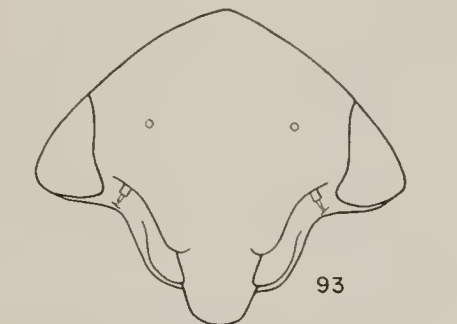
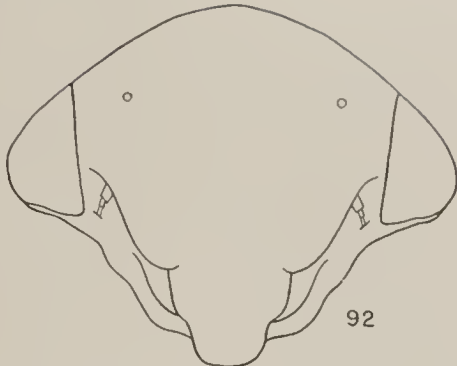


Fig. 92.—*Oncopsis viridis* ♀, face.  
 Fig. 93.—*Macropsis basalis* ♀, face.

usually broadly concave and in some species somewhat angulate; striae or rugae radiating from a central line obliquely toward the posterior angles. Elytra without appendixes.

These species occur for the most part upon willow, poplar, honey locust, and wild plum, and are frequently found in association with species of *Idiocerus*, which are found on at least two of the same trees or shrubs. The genus, which is distributed throughout the United States and Canada, contains nearly 40 species and varieties, of which 17 have been taken in Illinois. Two others may occur here.

The following key to species is condensed largely from that of Breakey (1932).

KEY TO SPECIES

- 1. Green in color; each hind tibia usually bearing a prominent black spot near the base; a black spot at apex of vertex . . . . . 1. *virescens* var. *graminea*
- Hind tibiae without black spots . . . . . 2
- 2. Elytra of a uniform color (color of underlying body must not be considered) . . . . . 3
- Elytra not of the same color or shade throughout . . . . . 17

3. Elytra green or greenish hyaline, sometimes slightly smoky. . . . . 4
  - Elytra amber to smoky amber. . . . . 14
  4. Prothoracic epimeron bearing a distinct black spot behind the eye. . . . . 5
  - Prothoracic epimeron unmarked. . . . . 8
  5. Female. . . . . **2. erythrocephala**
  - Male. . . . . 6
  6. Extremities of tibiae banded with black. . . . . 7
  - Extremities of tibiae not banded with black (western). . . . . **2. erythrocephala**
  7. Length 5 mm., face not marked with black. . . . . **3. trivialis**
  - Length 4 mm., face with definite black markings. . . . . **4. reversalis**
  8. Females. . . . . 9
  - Males. . . . . 13
  9. More than 5 mm. in length. . . . . 10
  - Not exceeding 5 mm. in length. . . . . 12
  10. Body concolorous with elytra. . . . . 11
  - Head and thorax reddish brown, elytra pale green. . . . . **5. rufocephala**
  11. Robust in form; clypeus tumid, keystone shaped. . . . . **6. viridis**
  - More slender in form; clypeus not so tumid, lateral margins more nearly parallel. . . . . **3. trivialis**
  12. Clypeus nearly parallel margined; elytra smoky, especially on the clavus. . . . . **15. fumipennis** var. **gleditschiae**
  - Clypeus definitely keystone shaped; elytra faintly smoky apically. . . . . **7. confusa**
  13. Robust in form; face long; smokiness of elytra concentrated on claval areas. . . . . **15. fumipennis** var. **gleditschiae**
  - Slender; face short; smokiness of elytra wanting or limited to apical areas. . . . . **7. confusa**
  14. Vertex and pronotum green to yellowish green, not spotted; abdomen fulvous. . . . . **6. viridis**
  - Vertex, pronotum, and abdomen otherwise. . . . . 15
  15. Anterior impressions concolorous with pronotum. . . . . **8. basalis**
  - Anterior impressions darkly maculate with fuscous. . . . . 16
  16. Pronotum obtusely angled anteriorly; lateral margins of clypeus bulging out over the lorae. . . . . **9. bifasciata**
  - Pronotum right angled anteriorly; lateral margins of clypeus nearly parallel, distinct. . . . . **2. erythrocephala**
  17. Face with conspicuous impressed black points or spotted with black. . . . . **10. tristis**
  - Face without points or spots, sometimes suffused with fuscous. . . . . 18
  18. Elytra hyaline with well-defined and nearly continuous transverse fuscous bands. . . . . 19
  - Elytra otherwise. . . . . 22
  19. Bases of elytra heavily banded with deep brownish fuscous. . . . . 20
  - Bases of elytra free of brownish or fuscous bands. . . . . 21
  20. Head and thorax concolorous with rest of body. . . . . **12. osborni**
  - Head and thorax reddish brown above in contrast with greenish body. . . . . **8. basalis**
  21. Elytra narrowly twice banded with fuscous, anterior band oblique, interrupted at claval suture. . . . . **9. bifasciata**
  - Elytra broadly twice banded with fuscous, anterior band transverse, not interrupted at claval suture. . . . . **11. canadensis**
  22. Elytra marked with black or deep fuscous in the form of patterns or definite areas. . . . . 23
  - Elytra deep brownish opaque, marked with a transverse hyaline band or pellucid white spots. . . . . 24
  23. Clavus black; corium of female green, corium of male smoky amber. . . . . **13. suturalis**
  - Black or fuscous color of elytra extending to near costa, costa green or greenish hyaline. . . . . **14. fumipennis**
  24. Elytra deep brownish opaque, a transverse band before the apex. . . . . 25
  - Elytra brownish opaque, unmarked, or marked with round pellucid white spots. . . . . 26
  25. Elytra uniform ferruginous brown, hyaline band narrow. . . . . **16. ferruginoides**
  - Elytra blackish, hyaline band usually indefinite; black in base of each elytron often confined to corium and concentrated along costa. . . . . **17. nigricans**
  26. Brownish, one pellucid white spot on each corium of female and sometimes of male; clavus concolorous with corium. . . . . **18. insignis**
  - Blackish brown, three pellucid white spots on each corium; clavus cinereous. . . . . **19. trimaculata**
1. *Macropsis virescens* var. *graminea* (Fabricius)
- Cicada graminea* Fabricius (1798, p. 521).
- Length of female 5.0 mm., male 4.4 mm. Slender, green, with vertex rather sharply pointed. Each hind tibia of both sexes bears a conspicuous black spot on the outside near the base. The face appears almost flat as viewed from the sides. The female is yellowish green, with a black spot at apex of vertex. The male is frequently infuscated above. Elytra greenish hyaline with apex smoky and veins green. Basal angles of scutellum in both sexes usually infuscated. Epimera marked with black spots.
- This variety of the species *virescens* Gmelin (1790, p. 2111) has been collected from the poplar, *Populus nigra*. It has been recorded from the eastern states and as far west as Wisconsin and Illinois.
- Illinois Records.—ALDRIDGE: May 8, 1932, Dozier, 3♂, 1♀. DUBOIS: May 24, 1917, 1♀. ELIZABETHTOWN: May 27-31, 1932, Dozier, 3♂, 3♀. GRAND TOWER: May 12, 1932, Frison, Ross, & Mohr, 1♂. KAMPSVILLE: June 27, 1934, DeLong &

Ross, 1 ♀. MOUND CITY: May 24, 1932. Dozier, 1 ♀. ROUND LAKE: June 27, 1936, Frison & DeLong, 25 ♂, 63 ♀. ULLIN: May 26, 1932, Dozier, 1 ♀.

## 2. *Macropsis erythrocephala* (Gillette & Baker)

*Pediopsis erythrocephala* Gillette & Baker (1895, p. 72).

Length of female 6 mm., male 5 mm. Dimorphic color. Female green, slightly tinted with fulvous anteriorly. Elytra pale greenish hyaline. Male brown to brownish green, heavily marked with fuscous. Face and area beneath fuscous, pronotum and scutellum brown, the basal angles of scutellum with black triangular spots. Elytra fuscous hyaline, veins darker. A large black spot on each epimeron in both sexes. Face distinctly concave as viewed from the side.

Commonly found on willow, *Salix longifolia*, this species has been collected from coast to coast, and is especially numerous in the northern states.

**Illinois Records.**—Many males and females, taken June 12 to August 24, are from Alton, Beardstown, Byron, Cache, Carbondale, Decatur, Eichorn, Elizabethtown, Fox Lake, Freeport, Galena, Geff, Grafton, Grand Detour, Grand Tower, Havana, Kampsville, Kankakee, Marshall, New Milford, Newton, Oquawka, Oregon, Palos Park, Pike, Prophetstown, Putnam, Savanna, Spring Grove, Spring Valley, Urbana, Vienna, Waukegan, and West Union.

## 3. *Macropsis trivialis* (Ball)

*Pediopsis trivialis* Ball (1902b, p. 304).

Length of female 5.5 mm., male 4.5 mm. More slender in form than *viridis*. Female yellowish green, unmarked, elytra greenish hyaline with concolorous veins. Male with black spots on the epimera, extremities of the fore and middle tibiae, and tarsal claws; elytra greenish hyaline, somewhat smoky toward the apex. In both sexes the second apical cell is usually more than half the length of the middle anteapical cell.

Taken from willow, *Salix amygdaloides*, this species is known to occur in the eastern United States and as far west as Colorado.

**Illinois Records.**—ELIZABETH: July 8, 1917, 1 ♀. FREEPORT: July 2, 1917, 1 ♂, 3 ♀. GALENA: July 5, 1917, 1 ♂. GEFF: June 12, 1934, DeLong & Ross, 1 ♀. HOMER:

June 4, 1916, 1 ♀. MONTICELLO: June 11, 1934, Frison & DeLong, 1 ♂, 3 ♀. PUTNAM: July 6, 1934, Ross & DeLong, 6 ♀. URBANA: June 19, 1889, Hart, 1 ♀; June 28, 1892, McElfresh, 1 ♂. WHITE HEATH: July 5, 1916, 1 ♀.

## 4. *Macropsis reversalis* (Osborn & Ball)

*Pediopsis reversalis* Osborn & Ball (1893, pp. 69, 123).

Length of female 4.5 mm., male 4.0 mm. Small and greenish. The female is unmarked, while the male has on the face two broad black bands, sometimes broken into spots, and black spots on the epimera and extremities of the legs. In some individuals the bands on the face are reduced to three spots, one on the apex above, and one just within and below each ocellus. Face somewhat tumid as viewed from the side. Elytra greenish hyaline.

This species has been taken from *Salix* spp. in the eastern United States.

**Illinois Records.**—Males and females, taken May 29 to July 16, are from Apple River Canyon State Park, Fulton, Galena, Grafton, Grand Detour, Havana, Herod, Lacon, Meredosia, Oquawka, Oregon, Pike, Putnam, Rock Island, and Urbana.

## 5. *Macropsis ruficeps* Osborn

*Macropsis scutellatus* Osborn (1928, p. 218). Name preoccupied.

*Macropsis ruficeps* Osborn (1932, p. 513). New name.

Length of female 5.5 mm. Yellowish green. Female with vertex, pronotum, anterior two-thirds of scutellum, and upper half of face reddish brown. Scutellum with black spots in basal angles, apical angle yellowish green. Elytra pale greenish hyaline, veins green. Epimera unmarked. Face appearing concave below vertex as viewed from the side. No male has been collected.

This is a transcontinental species and has been collected from willow, *Salix* spp.

**Illinois Records.**—FREEPORT: July 2, 1917, 1 ♀; July 4, 1917, 1 ♀. HOMER: June 14, 1916, 1 ♀.

## 6. *Macropsis viridis* (Fitch)

*Pediopsis viridis* Fitch (1851, p. 59).

Length of female 5.5 mm., male 4.5 mm. Robust, yellowish green. Female unmarked.

elytra greenish hyaline, veins green. Male elytra amber-brown, veins concolorous; each epimeron bears a broad black mark and abdomen is fulvous above. In both sexes face appears almost flat as viewed from the side. Elytra each with the second apical cell scarcely more than half as long as the middle anteapical cell.

This is a widely distributed northern transcontinental species that has been reported feeding upon willow, *Salix longifolia*.

**Illinois Records.**—Many males and females, taken May 12 to August 8, are from Algonquin, Apple River Canyon State Park, Alton, Champaign, Danville, Decatur, Eichorn, Elizabethtown, Fox Lake, Freeport, Fulton, Galena, Geff, Grafton, Grand Detour, Grand Tower, Grays Lake, Hardin, Havana, Herod, Iroquois, Kampsville, Lacon, Marshall, Meredosia, Monticello, New Holland, Newton, Oquawka, Oregon, Pike, Princeton, Putnam, Quincy, Round Lake, Savanna, Shawneetown, Spring Valley, Temple Hill, Urbana, Vienna, Wauconda, West Union, White Heath, and Zion.

### 7. *Macropsis confusa* Breakey

*Macropsis confusa* Breakey (1932, p. 827).

Length of female 4.75 mm., male 4.0 mm. Pale green, resembling *viridis* but smaller; without definite markings. Elytra faintly smoky. Face appearing distinctly tumid as viewed from the side. Epimera in both sexes without spots.

The species is known to occur on poplar, *Populus* spp., and has been taken in the northeastern states and in Wisconsin, as well as Illinois.

**Illinois Records.**—ANTIOCH: June 12, 1926, Ross & Burks, 16♂, 3♀; Aug. 1, 1930, Frison, Knight, & Ross, 1♀. DUBOIS: May 24, 1917, 1♂, 1♀. ELIZABETHTOWN: May 21–31, 1931, Dozier, 1♂. GALENA: June 28, 1935, DeLong & Ross, 15♀. HARDIN: June 5–9, 1932, Dozier, 1♀. KAMPVILLE: June 27, 1934, DeLong & Ross, 1♀. NEW HOLLAND: June 5, 1936, Mohr & Burks, 1♂. SAVANNA: July 27, 1892, McElfresh, Shiga, Hart, & Forbes, 1♂.

### 8. *Macropsis basalis* (Van Duzee)

*Pediopsis basalis* Van Duzee (1889b, p. 171).

Length of female 5.0 mm., male 4.0–4.25 mm. Robust, dark transverse bands on the

elytra. Epimera unmarked in the female, with black spots in the male. Female olive green; pronotum, scutellum, and upper portion of face ferruginous; elytra greenish hyaline, a broad black band on the base of each clavus and two other transverse bands sometimes fused. Male smoky ferruginous; elytra dark amber, with black basal bands as in female; vertex, pronotum, and scutellum with brown punctures; brown triangular spots in basal angles of scutellum.

This species, northern in range, occurs upon quaking aspen, *Populus tremuloides*.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: June 29, 1935, DeLong & Ross, 7♂, 33♀. GALENA: on aspen, July 10, 1934, DeLong & Ross, 3♂, 6♀; June 28, 1935, DeLong & Ross, 20♂, 19♀. GRAFTON: along river, June 26, 1934, DeLong & Ross, 1♀. SPRING GROVE: June 8, 1938, Burks & Mohr, 1♀. WARREN: June 29, 1935, DeLong & Ross, 2♂, 5♀.

### 9. *Macropsis bifasciata* (Van Duzee)

*Pediopsis bifasciata* Van Duzee (1889b, p. 173).

Length of female 5.25 mm., male 5.0 mm. Dull greenish ferruginous, marked by two dark transverse cross bands. Pronotum washed with fuscous on disc. Face pale yellow. Basal angles of scutellum with black triangular spots. Female with elytra grayish hyaline, an oblique transverse band across middle of each, interrupted at claval suture, and another transverse band just below the apex; veins concolorous. Male with elytra fuscous hyaline, without bands. Epimera of both sexes with large black spots.

This species has been collected from poplar, *Populus* spp., and ranges from the eastern United States to Colorado.

**Illinois Records.**—GALENA: July 10, 1934, DeLong & Ross, 2♀; June 28, 1935, DeLong & Ross, 1♀.

### 10. *Macropsis tristis* (Van Duzee)

*Pediopsis tristis* Van Duzee (1890b, p. 249).

Length of female 5.5 mm., male 4.75 mm. Cinereous brown, pale beneath. Pronotum and scutellum cinereous. Basal angles of scutellum with black triangular spots. Face with black band above and large circular black spot below. Elytra cinereous hyaline, veins lighter, narrowly margined with fuscous. Epimera slightly fuscous.

This species ranges from the East to the Middle West and is known to occur on wild plum, *Prunus* spp.

Illinois Record.—NORTHERN ILLINOIS: June, Peabody Collection, 2 ♀.

#### 11. *Macropsis canadensis* (Van Duzee)

*Pediopsis canadensis* Van Duzee (1890b, p. 111).

Length of female 5.25 mm., male 4.75 mm. Varying from pale yellowish green to pale fulvous, the elytra with two brown bands. Pronotum obtusely angled, moderately convex; elytra long, rather narrow, broadly rounded at apex.

Female head and thorax yellowish green or greenish fulvous, immaculate, epimera unmarked; elytra greenish hyaline, each with two brownish fulvous bands, the first near the middle and the second just before the apex. Male darker, fulvous or tawny, each epimeron bearing a large black spot; lower part of face and area beneath paler; scutellum cinereous, a brown triangle within each basal angle, a narrow red line down the center to the transverse impression, which is also reddened; elytra banded as in female.

This species is widely distributed from Maine to California. It should be found in northern Illinois.

#### 12. *Macropsis osborni* Breakey

*Macropsis osborni* Breakey (1932, p. 817).

Length of female 6 mm., male 5 mm. Superficially resembling *basalis*, especially in having a dark band across base of elytra. Face appears tumid as viewed from the side. Female yellowish green, elytra greenish hyaline, with a cupreous tint, a broad black band confined to the bases of the claval areas bordering scutellum; epimera without spots. Male green, washed with fuscous; elytra cinereous hyaline, tinged with fulvous, a broad black band on bases of elytra as in female; basal angles of scutellum with large triangular spots; epimera with black spots.

This species has been taken only in the middle western states, where it occurs in small numbers on cottonwood, *Populus deltoides*.

Illinois Records.—KAMPSVILLE: June 27, 1934, DeLong & Ross, 1 ♀. PIKE: June 28, 1934, DeLong & Ross, 1 ♀. SHAWNEETOWN: June 14, 1934, Ross & DeLong, 3 ♀.

#### 13. *Macropsis suturalis* (Osborn & Ball)

*Pediopsis suturalis* Osborn & Ball (1898, pp. 67, 119).

Length of female 5.5 mm., male 5.0 mm. Female green, with entire clavus black. Male sordid green, elytron smoky so that the black clavus is less conspicuous than in female; scutellum sordid green on the disc, each basal angle marked with a black triangle; pronotum and vertex marked with fuscous; epimera each bearing a black dash.

This species has been reported as occurring on willow, *Salix amygdaloides*. It is known to occur in Iowa, Kansas, Minnesota, Wisconsin, Ohio, Pennsylvania, and Maine, and it probably occurs in Illinois.

#### 14. *Macropsis fumipennis* (Gillette & Baker)

*Pediopsis fumipennis* Gillette & Baker (1895, p. 73).

*Pediopsis crocea* Osborn & Ball (1898, pp. 68, 120).

Length of female 4.75 mm., male 4.0-4.25 mm. Green, heavily tinged with smoky brown. Pronotum yellowish green, disc fuscous. Basal angles of scutellum each with black triangular spots and with two large round impressed green or yellow spots just before the anterior impression. Elytra black or dark brown opaque, costal margins green or yellowish. Epimera without spots.

This species has been taken from honey locust, *Gleditsia triacanthos*, and is recorded from Montana, Colorado, Kentucky, and Ohio, as well as Illinois.

Illinois Records.—ELIZABETHTOWN: May 27-31, 1931, Dozier, 1 ♂. HAVANA: June 14, 1934, DeLong & Ross, 1 ♂. IROQUOIS: June 5, 1932, Frison & Mohr, 2 ♂. MONTICELLO: June 11, 1934, Frison & DeLong, 1 ♂. MUNCIE: June 8, 1917, 1 ♂. ST. ANNE: July 20, 1934, DeLong & Ross, 1 ♀. SHAWNEETOWN: June 27, 1936, DeLong & Mohr, 2 ♀. URBANA: June 19, 1889, Hart, 1 ♂. VOLO: in bog, June 11, 1936, Ross & Burks, 1 ♂.

#### 15. *Macropsis fumipennis* var. *gleditschiae* (Osborn & Ball)

*Pediopsis gleditschiae* Osborn & Ball (1898, pp. 67, 122).

Length of female 4.75 mm., male 4.0-4.25 mm. Lighter in color than typical *fumipennis*. Female bright green, tinted with fus-

cous, apices of elytra hyaline. Male green, elytra brownish or fuscous. Darker specimens often have pronotum and scutellum clouded. Epimera unmarked in both sexes.

Occurring on honey locust, *Gleditsia triacanthos*, this variety ranges from Pennsylvania to Louisiana and Idaho.

**Illinois Records.**—CHAMPAIGN: June 5, 1889, Hart, 1♂. DONGOLA: on willow, May 13, 1916, 1♂. DUBOIS: May 23, 1917, 1♂; May 24, 1917, 2♂. MEREDOSIA: May 29, 1917, 3♂. URBANA: June 17, 1890, Marten, 1♂. WHITE HEATH: May 30, 1915, 1♂.

#### 16. *Macropsis ferruginoides* (Van Duzee)

*Pediopsis ferruginoides* Van Duzee (1889b, p. 171).

Length of female 5.5–6.0 mm., male 5.0 mm. Marked with ferruginous above and yellow below. Pronotum darker on disc. Scutellum often with basal angles, apex, and two discal spots yellow. Elytra ferruginous, opaque; costa with a narrow yellow margin. A transverse hyaline band before apex across the crossveins of the anteapical cells. Epimera of both sexes with black spots. Face concave above as viewed from the side.

This species has been taken from a narrow-leaved willow. It is chiefly middle

western, but ranges as far west as Colorado and New Mexico.

**Illinois Record.**—WAUKEGAN: Aug. 24, 1917, 1♀.

#### 17. *Macropsis nigricans* (Van Duzee)

*Pediopsis trimaculata* Van Duzee (1889b, p. 172). Preoccupied.

*Pediopsis bifasciata* Van Duzee in Osborn & Ball (1898, p. 118). Misidentification.

*Macropsis nigricans* Van Duzee (1916, p. 64). New name.

Length of female 5.5 mm., male 5.0 mm. Greenish brown, with black markings. Pronotum washed with fuscous, anterior impression usually brown or black. Scutellum greenish fulvous, with dark spots in basal angles. Each elytron hyaline, brown and black pigment on basal half variable, usually darker along costa and with spot at apex of clavus. Epimera with heavy black spots.

Known to occur on cottonwood, *Populus deltoides*, this species apparently is found only in the middle western region of the United States.

**Illinois Records.**—FREEPORT: July 2, 1917, 1♀. GRAFTON: June 26, 1934, DeLong & Ross, 3♀. GRAYS LAKE: June 10, 1936, Ross & Burks, 3♂, 4♀. KAMPSVILLE: June 27, 1934, DeLong & Ross, 1♀. PALOS PARK: June 19, 1933, Ross & Mohr, 1♀. PIKE: June 28, 1934, DeLong & Ross, 6♀.



Fig. 94.—*Macropsis trimaculata*.



18. *Macropsis insignis* (Van Duzee)

*Pediopsis insignis* Van Duzee (1889b, p. 171).

Length of female 5.0 mm., male 4.25 mm. Reddish brown, similar to and often confused with *trimaculata*. Pruinose when freshly collected. Pronotum ochraceous, disc dusky to the humeral angles. Scutellum ochraceous, a fuscous triangle within basal angles. Elytra paler on basal portions of costa, opaque except for the shiny veins and the apical margins of wings.

This is a widely distributed species from Pennsylvania to Colorado, and occurs on wild plum, *Prunus* spp.

**Illinois Records.**—DuBois: Aug. 9, 1917, 1 ♀. Eichorn: June 13, 1934, DeLong & Ross, 1 ♂, 2 ♀.

19. *Macropsis trimaculata* (Fitch)

*Pediopsis trimaculatus* Fitch (1851, p. 60).

Length of female 5.0 mm., male 4.5 mm. Dark brown or black, with three light spots in a row on each elytron, fig. 94. Female dark brown; male almost black. Epimera in both sexes each with a black bar, this occasionally obscured in the male by heavy pigmentation. Female pronotum testaceous, a dusky spot on disc. Male pronotum fuscous. In both sexes scutellum cinereous with a dark triangular spot in each basal angle; elytron with a pellucid white spot near the branching of the first sector, another at the juncture of the anteapical and basal cells, and a third within the third and fourth apical cells.

Occurring principally on wild plum, *Prunus* spp., this species has rather recently come into economic prominence since it has been proved able to transmit the peach yellows virus and cause severe economic losses in peach orchards. It is recorded from the East and as far west as Colorado.

**Illinois Records.**—URBANA: Augerville, June 23, 1916, 1 ♂. NORTHERN ILLINOIS: 1 ♀.

3. *ONCOPSIS* Burmeister

*Oncopsis* Burmeister (1838, p. 27, pl. 10).

Fig. 92. Vertex short and broad, roundedly produced, blunt. Face shorter and broader than in *Macropsis*. The striae of the pronotum are nearly transverse, not obliquely angled, and are usually not as coarse as in *Macropsis*.

The species of this genus are all shrub and tree inhabiting as far as known. Sixteen species have been recorded for North America, half of which occur in Illinois.

Due to color variations and a lack of structural characters, it is difficult at the present time to separate these species. The following key will serve to separate the female specimens fairly well, but a key to male structural characters has not been devised.

KEY TO SPECIES

1. Elytra each with five apical and three anteapical cells. . . . . 2  
Elytra each with four apical and two anteapical cells. . . . . 8. **verticis**
2. Female seventh sternite truncate, rounded or angularly produced, notched at apex but without projecting teeth. . . . . 3  
Female seventh sternite with small apical teeth each side of apical notch. . . . . 5
3. Female seventh sternite short, with a broad shallow notch; face usually dark brown or black. . . . . 1. **nigrinasi**  
Female seventh sternite with a deeper notch; face usually pale. . . . . 4
4. Female seventh sternite long, rounded, with a deep U-shaped notch; female usually a shade of yellow marked with black or orange; male usually darker. . . . . 6. **variabilis**  
Female seventh sternite long, triangularly produced, with a shallow emargination; color brown. . . . . 5. **sobrius**
5. Female seventh sternite with a broad shallow notch, teeth short, incurved; color gray; elytra subhyaline, spotted. . . . . 4. **cognatus**  
Female seventh sternite triangular, with apical teeth more distinctly produced. . . . . 6
6. Elytra smoky to brown, with pale hyaline areas. . . . . 7  
Elytra hyaline, nervures brown, each with a discal spot and the apex often dusky. Vertex dark brown to black, with a yellow band connecting the ocelli. . . . . 3. **pruni**
7. Gray to pale brown; female seventh sternite short, with small median teeth. . . . . 2. **minor**  
Usually brownish to reddish brown; female seventh sternite longer, teeth larger, more conspicuous. . . . . 7. **fitchi**

1. *Oncopsis nigrinasi* (Fitch)

*Athysanus nigrinasi* Fitch (1851, p. 61).

Length 4 mm. Small, yellowish or often brownish, and with dark brown or black face. In the female, coloration is variable, but as a rule the front, inner margins of lorae, and apexes of femora are dark brown or black. In pale specimens the elytra are subhyaline and with two transverse brown-

ish bands. In dark specimens there are white spots on discal cells, on the anteapical cells, and at base and near apex of clavus. The male is usually uniform brownish, with a yellowish transverse band on vertex and on base of front. Genitalia: Female seventh sternite short and bilobate or sinuate on posterior margin; male with long narrow plates.

This eastern species is reported from hornbeam, viburnum, and hazel.

**Illinois Records.**—ELIZABETH TOWN: May 27–31, 1931, Dozier, 1 ♀. HARRISBURG: June 25, 1932, Ross, Dozier, & Park, 1 ♀. HEROD: June 8–11, 1935, DeLong & Ross, 4 ♀; June 24, 1936, DeLong & Ross, 2 ♀. KARNAK: June 14, 1934, DeLong & Ross, 1 ♀.

### 2. *Oncopsis minor* (Fitch)

*Athysanus minor* Fitch (1851, p. 60).

Length 4 mm. Small, resembling *fitchi*, with yellow to brownish color and hyaline elytra. Face coarsely punctured. Disc of pronotum, scutellum, and elytra usually dark in color. White spots on elytra next to scutellum, on discal cells, and on anteapicals. Genitalia: Female seventh sternite with posterior margin slightly produced medially and bearing a pair of short teeth separated by a shallow notch; male plates long and slender.

This species, found in the East, as well as Illinois, is reported as occurring on birch.

**Illinois Record.**—MEREDOSIA: May 29, 1917, 1 ♀.

### 3. *Oncopsis pruni* (Provancher)

*Bythoscopus pruni* Provancher (1890, p. 290).

Length 4.0–4.25 mm. Grayish, resembling *fitchi*, with hyaline elytra and brownish veins. Vertex coarsely punctured, black, with a broad yellow band connecting the ocelli; front coarsely punctured, yellow. Pronotum yellowish to gray, usually with two or three black points behind each eye. Scutellum pale, with dark basal angles. Elytral nervures brown, commissural nerve-ure white, with brownish spots. Genitalia: Female seventh sternite triangularly produced, with a pair of median acute teeth.

This is a northern transcontinental species known to occur on wild *Prunus*. In recent years transmission of peach yellows has been attributed to it.

**Illinois Record.**—DUBOIS: May 24, 1917, 1 ♂.

### 4. *Oncopsis cognatus* (Van Duzee)

*Bythoscopus cognatus* Van Duzee (1890d, p. 225).

Length 5 mm. In size and general form resembling *fitchi* but gray in color instead of brownish, and female seventh sternite has a broad shallow depression and minute teeth at middle. In *fitchi*, seventh sternite is triangularly produced. Vertex dull yellow to gray, front brownish to black, pronotum paler on anterior margin. Vertex and pronotum coarsely punctate. Elytra gray, each with a brownish area from tip of clavus to base of anteapical cells. Genitalia: Female seventh sternite longer than in *pruni*, apical margin slightly concave, teeth minute, depressed; male plates long and slender.

This species has been collected from hazelnut, *Corylus americana*, in the northeastern United States.

**Illinois Records.**—ALGONQUIN: July 8, 1897, 1 ♀. HEROD: May 29, 1935, Ross & Mohr, 1 ♂.

### 5. *Oncopsis sobrius* (Walker)

*Bythoscopus sobrius* Walker (1851a, p. 874).

Length 5 mm. Yellowish, with brown elytra. Vertex, pronotum, and scutellum yellow, elytra darker, tawny to brown. Elytra with commissural line alternately marked with paler spots. Genitalia: Female seventh sternite similar to that of *variabilis*, with a small, median, rounded notch.

This species has been collected from birch, *Betula* sp., and associated plants in New England and Canada.

**Illinois Record.**—SAVANNA: June 13, 1917, 1 ♀.

### 6. *Oncopsis variabilis* (Fitch)

*Athysanus variabilis* Fitch (1851, p. 60).

Length 5 mm. Color and color pattern extremely variable. Of the more common color forms, some are bright yellow, with a black line or band along claval suture, and some are reddish brown, with yellow clavus. Others are yellow throughout, or almost entirely black, especially in the males. Genitalia: Female seventh sternite pro-

duced, and with a median conspicuous U-shaped notch.

Northern transcontinental in distribution, this species has been taken from birch, *Betula* sp., and specimens that are apparently of this species have been collected from hazelnut, *Corylus americana*, and alder, *Alnus* sp.

**Illinois Record.**—HARRISBURG: June 25, 1932, Ross, Dozier, & Park, 1 ♀.

#### 7. *Oncopsis fitchi* Van Duzee

*Athyanus fenestratus* Fitch (1851, p. 60).  
Name preoccupied.

*Oncopsis fitchi* Van Duzee (1916, p. 65).  
New name.

Length 4.5 mm. Brownish to reddish brown; elytra usually with pale hyaline spots, which are often absent in the males. Face and vertex dusky to brown, with a yellowish transverse band between ocelli. Face sometimes piceous. Basal angles of scutellum usually darker than pronotum. Margin of each clavus along scutellum hyaline, a hyaline spot near apex, and another on disc; also a hyaline spot on anteapical cells. Genitalia: Female seventh sternite triangularly produced, with two small median teeth; male plates long and narrow.

This species occurs on birch, *Betula* sp. It is distributed through the northern United States from Maine to Colorado.

**Illinois Record.**—HARDIN: June 5-9, 1932, Dozier, 1 ♀.

#### 8. *Oncopsis verticis* (Say)

*Jassus verticis* Say (1831, p. 308).

*Oncopsis distinctus* Van Duzee (1890d, p. 225).

Length 3.5-4.5 mm. Readily distinguishable from other species of the genus by the four apical cells and two anteapical cells.

Color variable in both sexes, but male usually darker than female. Female usually yellowish to pale brownish. Male usually brown, with commissural line and large costal spot on apical portion of each elytron pale. Vertex, pronotum, and scutellum punctured with fuscous. Scutellum with a dark triangular spot in each basal angle. Elytra brown, each darker on clavus, with a white spot before apex. Venter yellow. Genitalia: Female seventh sternite long, with a distinct U-shaped median notch, apex rounded; male plates long and narrow.

The species has been taken commonly from black walnut, *Juglans nigra*. Its range is from Maine to Colorado and south to Tennessee; it is rather abundant in different areas of Illinois.

**Illinois Records.**—Many males and females, taken May 25 to October 12, are from Albion, Algonquin, Alton, Castle Rock, Cedar Lake, Danville, Dixon Springs, Freeport, Galena, Grafton, Grand Detour, Hardin, Havana, Herod, Kankakee, Keithsburg, Lacon, Makanda, Marshall, Monticello, Muncie, Normal, Oquawka, Pike, Pinkstaff, Pulaski, Quincy, Urbana, Vienna, Weldon Springs, and White Heath.

#### Subfamily NIONINAE

A single genus of this subfamily occurs in the United States.

#### 4. *NIONIA* Ball

*Nionia* Ball (1915, p. 165).

This genus, which includes but a single species, distributed from the southeastern states to Illinois, was formerly placed in the subfamily with *Macropsis* and *Oncopsis*.

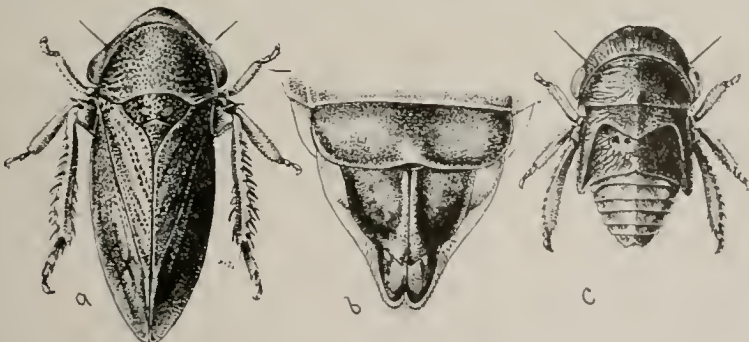


Fig. 95.—*Nionia palmeri*: a, adult; b, male genitalia; c, nymph. (From Osborn.)

*Nionia palmeri* (Van Duzee)

*Goniagnathus palmeri* Van Duzee (1891, p. 171).

Figs. 16, 95. Length 4–5 mm. Short, robust, head conically pointed, vertex almost parallel margined and so strongly arched that the anterior portion of the pronotum is produced decidedly anterior to the anterior margins of the eyes. Shiny black, resembling a *Macropsis* in general appearance. Apical nervures of elytra, ventral margins of eyes, and antennae reddish. Pronotum strongly punctured; distinct lines of punctures bordering veins of elytra. Female seventh sternite slightly produced at middle, pygofers short and broad, obtusely triangular; male valve concealed, plates triangular, acutely angled at apexes.

This is a grass-feeding species in moist woodland areas, and is common throughout central and southern Illinois.

**Illinois Records.**—Males and females, taken May 7 to August 17, are from Alton, Alto Pass, Danville, Dixon Springs, Elizabethtown, Fern Cliff, Grafton, Herod, Oakwood, Odin, and Vienna.

## Subfamily AGALLIINAE

The vertex is short and broad, the ocelli are on the face, and each hind wing has four apical cells.

Three of the five Nearctic genera listed by DeLong & Knull (1945) as belonging to this subfamily occur in Illinois. The subfamily was treated for North America by Oman (1933), who records about 80 species for the United States. The majority of these species are recorded from only western and southwestern states, but several are widely distributed.

## KEY TO GENERA

1. Vertex distinctly longer at middle than next to eyes, fig. 99; pronotum in large part transversely rugulose. . . . . 7. *Aceratagallia*  
Vertex usually shorter at middle than next to eyes, fig. 96; pronotum finely punctured and granulate . . . . . 2
2. Vertex distinctly shorter at middle than next to eyes; posterior margin of head sinuate behind eyes, figs. 96, 97. . . . . 5. *Agalliopsis*  
Vertex of nearly uniform length throughout its width; margin of head straight behind eyes, fig. 102 . . . . . 6. *Agallia*

5. *AGALLIOPSIS* Kirkaldy

*Agalliopsis* Kirkaldy (1907, p. 30).

Fig. 114. Median portion of vertex very short, usually longer next to eyes; posterior margin sinuately curved laterally and extending some distance behind the eyes. Lateral margins of pronotum obsolete. Elytra long and narrow. Male styles forked.

Two species generally distributed over the eastern states have been collected in Illinois.

## KEY TO SPECIES

- Female seventh sternite, fig. 97C, truncate or slightly produced; male plates, fig. 97B, elongate narrow, surpassing pygofers in length, concavely constricted at middle. Pronotum, fig. 97A, unmarked, or with a median fuscous line and a spot on each side . . . . . 1. *peneoculata*  
Female seventh sternite, fig. 96C, broadly and deeply concave; male plates, fig. 96B, short, triangular, gradually tapered from bases to blunt apexes, distinctly shorter than pygofers. Pronotum, fig. 96A, with at least two spots on each side of middle; elytra pale, each with a transverse fuscous band across the middle of clavus. . . . . 2. *novella*

1. *Agalliopsis peneoculata* Oman

*Agalliopsis peneoculata* Oman (1933, p. 17).

Fig. 97A. Length 4.0–4.5 mm. Resembling *oculata* in size and form but with the elytra concolorous except for an indistinct transverse smoky bar just posterior to the forking of the first sector. Vertex shorter at middle than next to eyes. Pronotum with posterior margin nearly straight. Elytra long and tapering. Genitalia: Female seventh sternite, fig. 97C, with posterior margin broad and convex. Male plates, fig. 97B, long, lateral margins concave on basal two-thirds, tips bluntly rounded; aedeagus, fig. 106, long and slender, the tip in dorsal view appearing very broad and somewhat bilobed.

This species was previously recorded from New York, Connecticut, and Michigan.

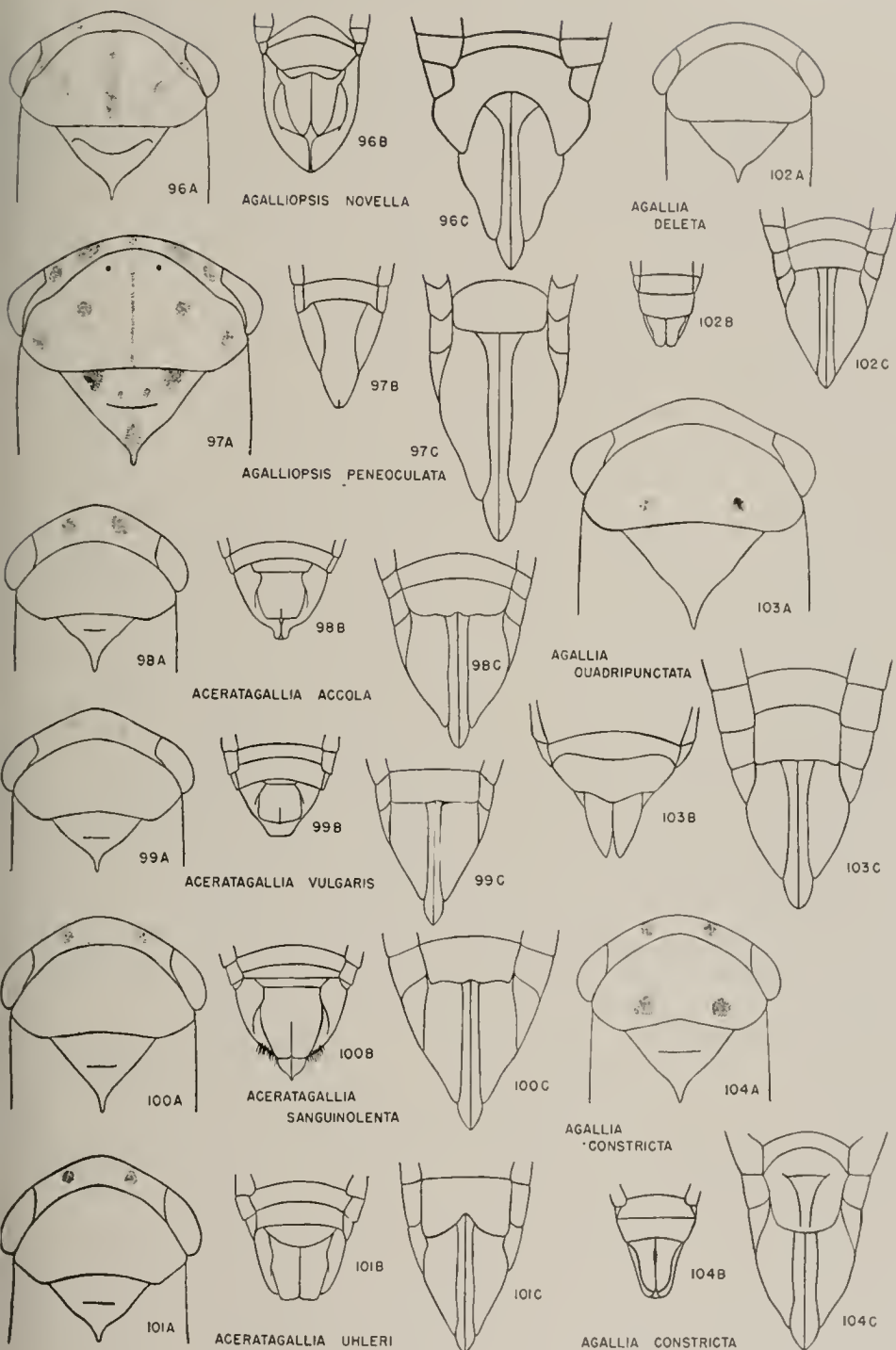
**Illinois Record.**—KARNAK: June 14, 1934, DeLong & Ross, 1 ♂, 10 ♀.

2. *Agalliopsis novella* (Say)

*Jassus novellus* Say (1831, p. 309).

*Macropsis nobilis* Forbes (1885, p. 22).

Fig. 96A. Length 3.5–4.0 mm. Color usually light testaceous, sometimes darker;

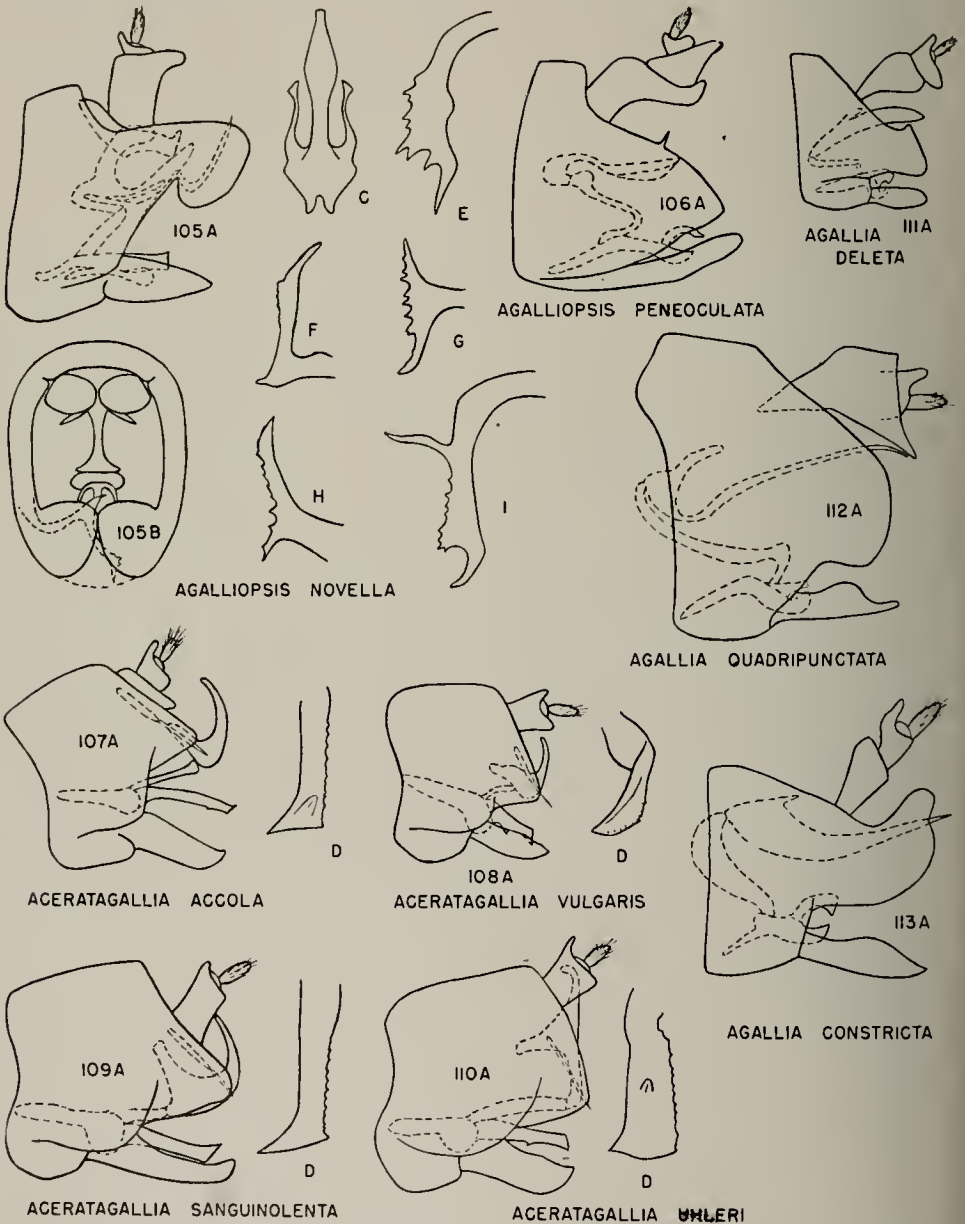


Figs. 96-104.—Agallinae. *A*, head and pronotum; *B*, male external genitalia; *C*, female genitalia. (From Oman.)

margins of ocelli, a round spot behind each ocellus on vertex, and an elongate spot next to each eye black. Pronotum with a median stripe and a spot on either side brown. All of these markings may vary in intensity. Elytra brown to black, veins pale. Genitalia: Female seventh sternite, fig. 96C, with posterior margin broadly and roundedly

excavated at middle, lateral lobes rounded or somewhat pointed. Male valve, fig. 96B, short, emarginate posteriorly; plates semi-tubular, bluntly rounded at apex, and scarcely covering the opening of the large genital chamber. The internal male genital structures are variable in form, fig. 105.

This is a common species on herbaceous



Figs. 105-113.—Agalliinae, male genitalia. A, lateral view; B, caudal view; C, aedeagus; D, style; E-I, pygofer hook showing variation. (From Oman.)



Fig. 114.—*Agalliopsis novella*: a, adult; b, c, nymph; d, face; e, elytron; f, female genitalia; g, h, male genitalia. (From Osborn.)

vegetation, and occurs throughout the eastern United States.

**Illinois Records.**—Many males and females, taken March 20 to October 2, are from Aldridge, Algonquin, Alton, Alto Pass, Anna, Apple River Canyon State Park, Augerville, Carbondale, Cave in Rock, Champaign, Chester, Danville, Dixon Springs, Dolson, Dongola, East Cape Girardeau, Eichorn, Elizabethtown, Fern Cliff, Fountain Bluff, Freeport, Golconda, Grand Detour, Hardin, Havana, Herod, Homer, Jonesboro, Kankakee, Karnak, Mahomet, Makanda, Monmouth, Monticello, Muncie, Normal, Oakwood, Olive Branch, Oregon, Port Byron, Quincy, Rock Island, Savanna, Shawneetown, Sparta, Topeka, Urbana, Ursa, Vienna, Volo, Weldon Springs, White Heath, White Pines Forest State Park, Wolf Lake, and Zion.

6. *AGALLIA* Curtis

*Agallia* Curtis (1833, p. 192).

Vertex short, usually about uniform in length over its entire width; posterior margin evenly curved, not extending behind the eyes laterally. Pronotum short, lateral margins almost obsolete. Elytra usually short.

This genus contains two of the most common species of leafhoppers in Illinois. One of them, *constricta*, is often found in large numbers on economic crops.

KEY TO SPECIES

- 1. Pale brown, without dark spots on vertex and pronotum, fig. 102.A . . . . . 3. *deleta*
- Pale to dark brown, with four distinct black spots on vertex and pronotum, figs. 103.A, 104.A . . . . . 2

- 2. Robust; female seventh sternite, fig. 103C, truncate or slightly concave; male plates, fig. 103B, narrowed and pointed, tips diverging . . . . . 1. *quadripunctata*
- More slender, wedge shaped; female seventh sternite, fig. 104C, roundedly and convexly produced; male plates, fig. 104B, narrowed near base and then produced, convexly rounded to blunt, and with appressed apices . . . . . 2. *constricta*

1. *Agallia quadripunctata* (Provancher)

*Bythoscopus quadripunctatus* Provancher (1872, p. 376).  
*Ulopa canadensis* Van Duzee (1892c, p. 301). (Immature specimens).

Fig. 103A. Length 4 mm. Robust, varying in color from pale brown to fuscous. Two obliquely converging black spots on front margin of vertex and a pair of black spots on pronotum near posterior margin. Elytra light brown, veins pale. Female seventh sternite, fig. 103C, with posterior margin truncate. Male plates, fig. 103B, small, acutely angled, their lateral margins convex, the plates as long as the pygofer. Male internal genitalia as in fig. 112.

Experimental work reported by Black & Oman (1947) indicates that in the eastern United States the species normally reproduces parthenogenetically. Their cultures of the species were maintained on crimson clover, *Trifolium incarnatum*.

A common species in the northeastern United States, *quadripunctata* occurs abundantly in moist open woodland areas.

**Illinois Records.**—Many males and females, taken March 4 to January 16, are from Algonquin, Alto Pass, Antioch, Beach, Bloomington, Carbondale, Champaign,

Chester, Chicago, Cypress, Danville, Dixon Springs, Dolson, Dongola, Eichorn, Elizabethtown, Fountain Bluff, Fox Lake, Geff, Golconda, Grafton, Herod, Homer, McHenry, Mahomet, Monticello, Muncie, Normal, Oakwood, Olive Branch, Pulaski, Quincy, Rago, Rock Island, Springfield, Thebes, Urbana, Vienna, White Heath, Wilmington, and Zion.

## 2. *Agallia constricta* Van Duzee

*Agallia constricta* Van Duzee (1894a, p. 90).

Fig. 104A. Length 3.25–3.75 mm. Light brown in color, a pair of black spots on the anterior margin of the vertex behind ocelli, and another pair behind these on the posterior margin of the pronotum. Elytra brown, veins paler. Female seventh sternite, fig. 104C, twice as long as preceding, keeled medially; lateral angles produced and rounded, central portion of posterior margin shallowly notched on median line. Male plates, fig. 104B, broad at bases, narrowed to median constriction and then slightly widened caudally, plates together rounded at apex; pygofers slightly longer and broader than plates. Male internal genitalia as in fig. 113.

This is probably the most common species of *Agallia* in the eastern United States.

**Illinois Records.**—Many males and females, taken April 18 to September 24, are from Albion, Alton, Alto Pass, Anna, Cache, Cairo, Carbondale, Carman, Cave in Rock, Cobden, Dixon, Dolson, Dongola, Dubois, East Cape Girardeau, Eichorn, Elizabethtown, Fountain Bluff, Fulton, Golconda, Grand Tower, Harrisburg, Havana, Herod, Homer, Kampsville, Karnak, Kirkwood, La Rue, Luna, Macomb, Meredosia, Metropolis, Monmouth, Mount Carmel, Mount Sterling, Muncie, Murphysboro, Niota, Oakwood, Oquawka, Parker, Pike, Pulaski, Putnam, Quincy, Rosiclare, Saratoga, Seymour, Shawneetown, Sparta, Sumner, Texas City, Thebes, Unity, Urbana, Ursa, Vandalia, Vienna, and Wolf Lake.

## 3. *Agallia deleta* Van Duzee

*Agallia deleta* Van Duzee (1909a, p. 210).  
*Agallia immaculata* Lathrop (1917, p. 120).

Fig. 102A. Length 2.5–3.0 mm. Robust, vertex uniform in length and evenly rounded. Color usually pale brown, without definite markings. Elytra subhyaline, appear-

ing dark. Males frequently darker than females. Female seventh sternite, fig. 102C, short, posterior margin truncate but often appearing concave. Male plates, fig. 102B, small, broad at base, abruptly narrowed to blunt apexes; aedeagus in lateral view appearing broad and almost straight, in dorsal view appearing laterally compressed and with apex divided for a short distance; the flaplike projections of the posterior margins of pygofers are turned slightly inward; internal genitalia as in fig. 111.

This is a common grass species in the southern states and along the Atlantic sea coast. It possibly occurs in Illinois.

## 7. *ACERATAGALLIA* Kirkaldy

*Acceratagallia* Kirkaldy (1907, p. 30).

Vertex short, usually distinctly longer at middle than next to eyes; posterior margin broadly rounded, not produced behind the eyes. Lateral margins of pronotum very short. Elytra about as long as abdomen. Male styles not forked.

This genus contains some of the smallest individuals of the subfamily; a few species are extremely abundant and important economic pests. Within the genus the species are almost identical on the basis of external characters. The males, however, are readily identified by characters of the internal genitalia. The females are difficult to identify on any basis, but the few characters that will aid in their identification have been offered in the following key.

### KEY TO SPECIES

1. Females.....5  
Males.....2
2. Each style, fig. 108D, strongly curved laterally, twisted and somewhat keeled.....**1. vulgaris**  
Each style not strongly curved or twisted, but straight and boat shaped.....3
3. Each style, fig. 110D, broad, outer point slightly produced; aedeagus shaft, fig. 110A, straight, hooked at apex.....**4. uhleri**  
Each style narrowed, foot shaped, outer point sharp, conspicuous; aedeagus shaft strongly curved dorsally.....4
4. Each style, fig. 107D, with ventral tooth. Size 2.5–2.75 mm., dark in color. Male plates, fig. 98B, shorter than pygofers.....**2. accola**  
Each style, fig. 109D, without ventral tooth. Size 2.75–3.0 mm., brown to gray in color. Male plates, fig. 100B, reaching apex of pygofers.....**3. sanguinolenta**



5. Female seventh sternite, fig. 101C, broadly, rather shallowly, and angularly excavated ..... 4. *uhleri*  
 Female seventh sternite truncate or sinuate, not excavated, as in figs. 98C-100C ..... 6  
 6. Length 3.0-3.25 mm. .... 3. *sanguinolenta*  
 Smaller in size, 2.75-3.0 mm. .... 1. *vulgaris*, 2. *accola*

### 1. *Aceratagallia vulgaris* Oman

*Aceratagallia vulgaris* Oman (1933, p. 60).

Fig. 99A. Length 2.5-3.0 mm. Similar to *sanguinolenta* but usually paler in color. Yellowish brown to darker brown, vertex with a black spot above each ocellus; often a dark median line on vertex and pronotum. Elytra subhyaline, veins brown. Female seventh sternite, fig. 99C, with posterior margin almost truncate, faintly notched at middle. Male valve, fig. 99B, very short, often concealed by eighth sternite; plates short and broad, wider at apex than at base, apex almost truncate. Male internal genitalia as in fig. 108.

This is a common form in the Mississippi River valley. It occurs abundantly upon the Illinois prairies. It can be distinguished from all the other eastern species by the twisted styles. For many years it was named *cinerea* (Osborn & Ball) and is commonly found in eastern and midwestern collections under that label. The true *cinerea* is a western species.

**Illinois Records.**—Many males and females, collected June 12 to October 2, are from Albion, Alto Pass, Alton, Ashley, Barry, Carbondale, Cave in Rock, Dongola, Dubois, Fairfield, Fountain Bluff, Galena, Geff, Gibsonia, Murphysboro, Oak Lawn, St. Anne, St. Joseph, Shawneetown, Vienna, and White Pines Forest State Park.

### 2. *Aceratagallia accola* Oman

*Aceratagallia accola* Oman (1933, p. 57).

Fig. 98A. Length 2.5-3.0 mm. Dark brown, with a brown spot above each ocellus and a brown area next to each eye. Resembling *sanguinolenta* but smaller, more robust, and darker in color. Female seventh sternite, fig. 98C, slightly produced at middle, posterior margin shallowly and roundly notched at middle, slightly sinuate on either side of notch. Male valve, fig. 98B, short, truncate, appearing transverse; plates

short, slightly narrowed to truncate apices. Male internal genitalia as in fig. 107.

This eastern species cannot be distinguished easily from *sanguinolenta*, but the smaller size and darker color will usually assist in its identity. An examination of the male internal genitalia will easily verify or disprove the identification from external characters.

**Illinois Records.**—DUBOIS: sweeping from grass, July 2, 1909, 1♂, 1♀. FOREST CITY: sand, June 6, 1905, Hart, 1♂.

### 3. *Aceratagallia sanguinolenta* (Provancher)

*Bythoscopus sanguinolenta* Provancher (1872, p. 376).

*Bythoscopus siccifolius* Uhler (1877, p. 359).

Fig. 100A. Length 2.75-3.25 mm. Robust, light brown with fuscous markings. A black or dark brown spot above each ocellus, a light brown patch next to each eye, and a longitudinal light brown stripe each side of pale median line. Pronotum irregularly marked with fuscous on anterior margin and with indistinct longitudinal stripes. Elytra pale brown, veins brown, marked with white on clavus. Female seventh sternite, fig. 100C, as in *accola*, but with lateral angles more distinct, posterior margin shallowly and medially notched.

Male valve, fig. 100B, short, truncate, transverse; plates rather broad, lateral margins convexly and roundedly narrowed to truncate apices. Male internal genitalia as in fig. 109.

This is the most widespread and abundant species of the genus. It occurs throughout the eastern states and Canada and has been recorded as far west as Utah and Arizona. It occurs abundantly upon many economic crops and causes heavy feeding injury. Commonly known as the clover leafhopper, it is probably most abundant upon legume hosts.

**Illinois Records.**—Many males and females, collected June 13 to October 3, are from Albion, Alton, Amboy, Antioch, Anvil Rock, Apple River Canyon State Park, Barry, Beach, Cave in Rock, Decatur, Des Plaines, Dixon, Dixon Springs, Eichorn, Evergreen Park, Fulton, Galena, Gibsonia, Graftoo, Grand Tower, Hanover, Havana, Herod, Kampsville, Kimmundy, Marshall, Norris City, Oak Lawn, Oakwood, Ogden, Pike, Port Byron, St. Anne, St. Joseph, Savanna, Sheffield, Springfield, Starved

Rock State Park, Summit, Thomson, Vienna, Volo, Watson, White Pines Forest State Park, and Zion.

#### 4. *Aceratagallia uhleri* (Van Duzee)

*Agallia uhleri* Van Duzee (1894a, p. 91).

Fig. 101A. Length 3.25-3.75 mm. Resembling *sanguinolenta* but more slender and with the female seventh sternite deeply notched posteriorly. Vertex slightly swollen between ocelli, longer at middle than next to eyes, posterior margin broadly and evenly rounded. Elytra each with three antepical cells. Color brownish cinereous. Face pale yellowish. Spots on vertex above ocelli round and black. Scutellum with triangular basal spots black and with a dark transverse suture. Elytra subhyaline, sometimes fuscous along commissural line, veins dark, occasionally with white spots. Genitalia: Female seventh sternite, fig. 101C, with posterior margins angularly excavated nearly half way to the base. Male plates, fig. 101B, heavy, lateral margins straight, slightly converging, tips truncate, about equaling pygofer in length; styles, fig. 110D, each broad on posterior portion, tip truncate, outer point slightly produced, inner margin serrate; ventral tooth of style sharp and slightly hooked; tip of aedeagus, fig. 110A, as seen in lateral view, bent sharply upward.

This species is common in the plains region west of the Mississippi River.

Illinois Records.—ALTON: June 26, 1934, DeLong & Ross, 3 ♀. APPLE RIVER CANYON STATE PARK: July 11, 1934, Frison & DeLong, 1 ♀. PIKE: Mississippi floodplain, June 28, 1934, 1 ♀.

#### Subfamily BYTHOSCOPIINAE

This subfamily is characterized by a short vertex and by forewings that are set with short conspicuous setae.

Only one genus, *Stragania*, is known to occur in the United States.

#### 8. *STRAGANIA* Stål

*Stragania* Stål (1859, p. 49).

*Pachyopsis* Uhler (1877, p. 466).

*Gargaropsis* Fowler (1896, p. 167).

Figs. 17, 29. Head, including eyes, narrower than pronotum, very short, parallel margined, slightly but broadly rounded, almost truncate. Pronotum large, finely and

transversely striate. Elytra short and broad, deeply punctured, covered with hairs.

Twenty species are known to occur in North America. Of this number only three are found in the eastern United States and one of these occurs only in that portion along the coast of the Gulf of Mexico.

#### 1. *Stragania apicalis* (Osborn & Ball)

*Macropsis apicalis* Osborn & Ball (1898, p. 64).

*Macropsis alabamensis* Baker (1900a, p. 58).

Fig. 115. Length 4.5-5.0 mm. Broad and robust, green, with anterior half of pronotum washed with yellow. Elytra green, covered with greenish hairs. A faint line along claval suture, apex of clavus, and apical margin of each elytron brown to black. Venter and legs deep green, tips of tarsi black. Each elytron exceeding abdomen in length and with a broad appendix, the whole surface except appendix covered with short hair. Female seventh sternite with posterior margin broadly rounded and with slight notch at center. Male valve long, truncate, plates rather short, triangular, apexes angled.

This is a common species throughout the state on honey locust.

Illinois Records.—Many males and females, taken May 27 to September 22, are from Alton, Barry, Byron, Danville, Dar-

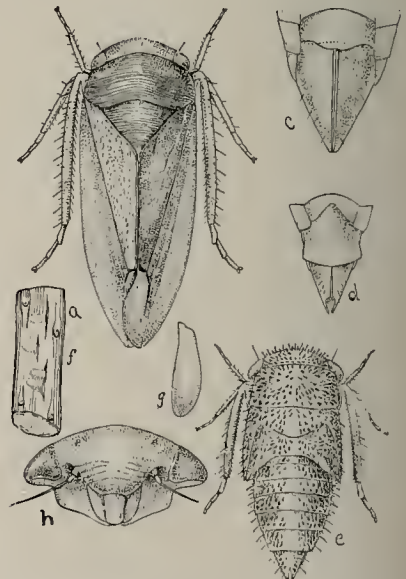


Fig. 115.—*Stragania apicalis*. (From Osborn.)

win, Dongola, Dubois, Du Quoin, Eichorn, Elizabethtown, Fairfield, Grand Tower, Hanover, Ludlow, Makanda, Meredosia, Monticello, Paxton, Shawneecown, Urbana, and Vienna.

### Subfamily TETTIGONIELLINAE

The cylindrical-shaped body with ocelli on the disc of vertex, and the three apical cells in the hind wing will usually distinguish this group. The frontal sutures extend over the anterior margin of vertex nearly to the ocelli.

Representatives of 11 of the 15 Nearctic genera in this group occur in Illinois. More species of the subfamily occur in the West than in the East.

### KEY TO GENERA

1. Posterior corner of pronotum nearly right angled, fig. 117; two claval veins nearly always joined, as in figs. 128, 129 ..... 2
- Posterior corner of pronotum obtuse or rounded; claval veins, if present, never touching ..... 3
2. Face bulbously inflated, fig. 123; claval veins at most slightly coalesced or connected by a short veinlet, fig. 129 ..... 3
- Face convexly sloping, fig. 126; claval veins broadly coalesced and sometimes with secondary branches, fig. 128 ..... 3
3. Margin of vertex with a distinct angulate swelling above each antenna, fig. 127; vertex with a deep longitudinal furrow from near base almost to apex, fig. 121 ..... 3
- Margin of vertex without an angulate swelling above antenna; vertex at most

### 11. *Oncometopia*

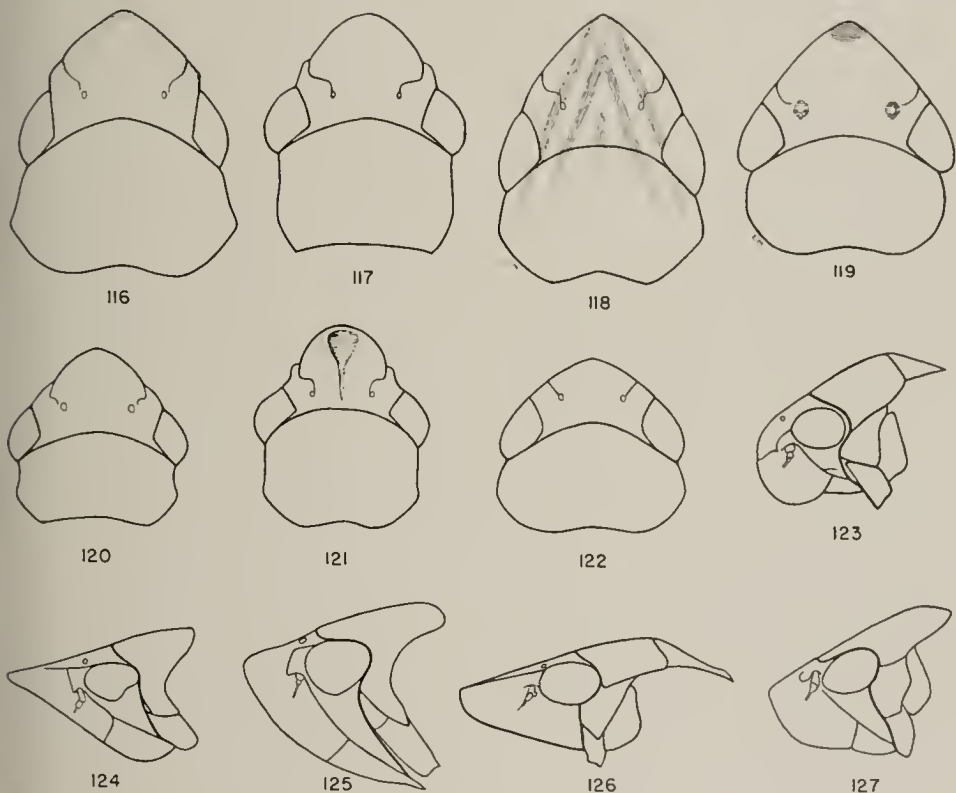
Face convexly sloping, fig. 126; claval veins broadly coalesced and sometimes with secondary branches, fig. 128

### 12. *Homalodisca*

3. Margin of vertex with a distinct angulate swelling above each antenna, fig. 127; vertex with a deep longitudinal furrow from near base almost to apex, fig. 121

### 9. *Aulacizes*

Margin of vertex without an angulate swelling above antenna; vertex at most



### Tettigoniellinae, heads and thoraxes

- Fig. 116.—*Graphocephala coccinea*.  
 Fig. 117.—*Oncometopia undata*.  
 Fig. 118.—*Sibovia occatoria*.  
 Fig. 119.—*Plesiommata tripunctata*.  
 Fig. 120.—*Cuerna lateralis*.  
 Fig. 121.—*Aulacizes irrorata*.

- Fig. 122.—*Kolla bifida*.  
 Fig. 123.—*Oncometopia undata*.  
 Fig. 124.—*Draculacephala producta*.  
 Fig. 125.—*Carnocephala flaviceps*.  
 Fig. 126.—*Homalodisca triquetra*.  
 Fig. 127.—*Aulacizes irrorata*.

- depressed toward middle of anterior margin.....4
- 4. Posterior margin of pronotum broadly and evenly emarginate and almost parallel with anterior margin, fig. 120.....10. **Cuerna**  
Posterior margin of pronotum very shallowly emarginate to subtruncate, and not parallel with anterior margin.....5
- 5. Elytra with apical part reticulate veined, fig. 130.....6  
Elytra not reticulate veined, as in fig. 129.....7

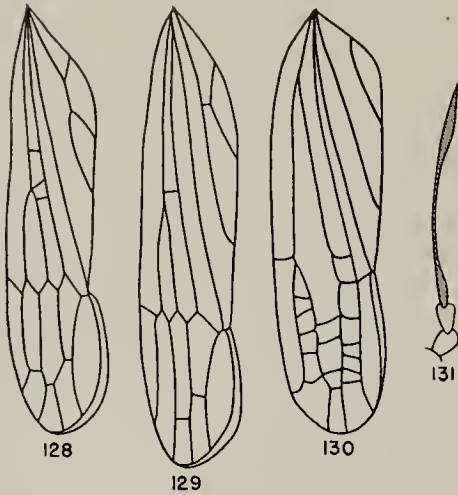


Fig. 128.—*Homalodisca triquetra*, elytron.  
Fig. 129.—*Oncometopia undata*, elytron.  
Fig. 130.—*Draeculacephala* sp., elytron.  
Fig. 131.—*Helochara communis*, ♂ antenna.

- 6. Front appearing nearly straight in profile, fig. 124; vertex flattened, depressed behind apex and anterior to ocelli, fig. 134.....19. **Draeculacephala**  
Front appearing convex in profile, fig. 125; vertex slightly convex and without depressions.....16. **Carneocephala**
- 7. Entire upper surface closely punctured, uniform green and rather dull in luster; antenna of male enlarged or flattened at apex, fig. 131.....15. **Helochara**  
Upper surface nearly always smooth, at least elytra unpunctured; antenna of male slender.....8
- 8. Vertex pointedly produced, with margins nearly straight from eye to apex, fig. 119; clavus with one vein; elytra white, with longitudinal veins broadly striped with brown.....18. **Plesiommata**  
Vertex more bluntly produced, with margins more convex from eye to apex, as in fig. 118; clavus usually with two distinct veins, but sometimes veins absent.....9
- 9. Antennae at least half as long as body; head and pronotum with a median and two pairs of narrow diagonal dark stripes, fig. 118.....21. **Sibovia**

- Antennae not longer than width of head; head and pronotum without diagonal stripes.....10
- 10. Head wider than pronotum, fig. 31; anterior margin of vertex with a median dark spot usually not joined by any other markings.....20. **Neokolla**  
Head usually distinctly narrower than pronotum; dark spot at anterior margin of vertex, if present, joined by other markings.....11
- 11. Vertex less than one and one-half times as wide as long; face usually very pale yellowish; anterior margin of vertex with a narrow dark band from eye to eye, fig. 116.....17. **Graphocephala**  
Vertex at least one and two-thirds times as wide as long; face usually dark; anterior margin of vertex without a distinct narrow band, as in fig. 122.....12
- 12. Brown to shiny black, without black bands.....13. **Ciminius**  
Green, with black transverse bands on vertex and pronotum, fig. 133.....14. **Kolla**

9. **AULACIZES** Amyot & Serville

*Aulacizes* Amyot & Serville (1843, p. 571).

Figs. 121, 127. Posterior corner of pronotum obtusely rounded to the slightly emarginate posterior margin; pronotum narrower than head. Lateral margin of vertex with an angulate swelling above antennal base; anterior margin evenly rounded; disc of vertex with a deep longitudinal furrow, which is broadened anteriorly behind apex. Front appearing very convex in profile and distinctly angled with vertex. Claval veins not joined.

Two species are recorded in this genus for the United States. One is known only from Florida, and the other is widely distributed throughout the eastern United States.

1. *Aulacizes irrorata* (Fabricius)

*Cicada irrorata* Fabricius (1794, p. 33).  
*Cicada nigripennis* Fabricius (1794, p. 32).  
*Aulacizes rufiventris* Walker (1851a, p. 796).

Length 12.5 mm. Reddish brown, irrorate with yellow. Head triangular, apex rounded, fig. 121. Vertex a little shorter than basal width, surface irregular and with median furrow and carinate margin. Pronotum hexagonal, coarsely pitted. Color varying from light to dark reddish brown, with black blotches on vertex and scutellum. Spots on costal margin of each elytron and many irrorations yellow. Female seventh sternite with posterior margin broadly

rounded, shallowly notched at middle. Male plates together concavely triangular.

Frequently taken from rank herbaceous growths of vegetation and occurring many times in the shrubby habitats, this species occurs throughout the eastern United States and as far west as Texas.

**Illinois Records.**—Many males and females, taken April 17 to October 5, are from Aldridge, Ashley, Brownfield, Cave in Rock, Central City, Centralia, Charleston, Danville, Dixon Springs, Dolson, Dongola, Dubois, East St. Louis, Elizabethtown, Fern Cliff, Fountain Bluff, Golconda, Grafton, Grand Tower, Hardin, Havana, Herod, Homer, Jacksonville, Jonesboro, Makanda, Manchester, Marshall, Metropolis, Muncie, Oakwood, Parker, Pine Hills, Pounds, Quincy, St. Joseph, Starved Rock State Park, Stonefort, Urbana, Vienna, West Union, White Heath, and Wolf Lake.

## 10. CUERNA Melichar

*Cuernia* Melichar (1924, p. 199).

Fig. 120. Posterior corner of pronotum obtuse, posterior margin broadly and evenly emarginate, almost parallel with anterior margin; pronotum narrower than head. Lateral margin of vertex slightly rounded above antennal base; anterior margin a little angulate at apex. Disc of vertex a little depressed. Claval veins not joined.

Fourteen species are recorded in the genus by DeLong & Knull (1945). Two species have been taken in Illinois; the others are western and southwestern (Oman & Beamer 1944).

### KEY TO SPECIES

Elytra reddish, wing veins dark; surface of elytra finely rugose between veins

..... 1. *lateralis*

Elytra black; surface of elytra, especially in basal region, with distinct punctures

..... 2. *limbata*

### I. *Cuernia lateralis* (Fabricius)

*Cercopis lateralis* Fabricius (1798, p. 524).

*Cercopis marginella* Fabricius (1803, p. 96).

New name.

*Cercopis costalis* Fabricius (1803, errata). New name.

*Tettigonia striata* Walker (1851a, p. 775).

*Tettigonia lugens* Walker (1851a, p. 775).

*Tettigonia pyrrhotelus* Walker (1851a, p. 775).

Length 7-8 mm. Elytra red, marked with black nervures. Vertex and pronotum black,

irrorate with yellow, reflexed portions margined with yellow. Scutellum black, median line and other markings yellow. Face black, with very small yellow spots; margin of body with a yellow stripe extending from apex of vertex to each eye, and on each side of thorax and abdomen to pygofer. Female seventh sternite truncate posteriorly. Male plates triangular, a little longer than basal width.

Abundant in pastures and in herbaceous growth in cut-over areas, this species is distributed throughout the eastern United States and occurs as far west as California.

**Illinois Records.**—ALTON: June 26-27, 1934, DeLong & Ross, 2♂, 3♀. CAVE IN ROCK: Oct. 2, 1934, Ross & Frison, 2♂, 2♀. GRAFTON: June 26, 1934, DeLong & Ross, 2♂; Oct. 5, 1939, Ross & Burks, 1♀.

### 2. *Cuernia limbata* (Say)

*Tettigonia limbata* Say (1825, p. 340).

Length 8 mm. Similar in size and shape to *lateralis*, but black, with a few very small yellowish spots on vertex, pronotum, and scutellum. Face black, with small yellow spots. Surface of elytra, especially in basal region, distinctly punctured. Female seventh sternite similar to that of *lateralis*.

This species has been recorded from the middle western states and as far west as California and Colorado.

**Illinois Record.**—OAKWOOD: Middle Fork, April 26, 1911, 2♀.

## 11. ONCOMETOPIA Stål

*Oncometopia* Stål (1869, pp. 60, 62).

Figs. 117, 123. Head broader than pronotum, vertex rounded, obtuse, disc convex, rounding to front, eyes prominent, front gibbous; a distinct ledge over antennal socket. Pronotum short, broadly rounding in front. Elytra narrow, the lateral margins of abdominal segments exposed.

Of the three species that occur in North America, only one is common in the eastern United States.

### I. *Oncometopia undata* (Fabricius)

*Cicada undata* Fabricius (1794, p. 32).

*Cicada orbona* Fabricius (1798, p. 520).

*Proconia nigricans* Walker (1851a, p. 783).

*Proconia clarior* Walker (1851a, p. 784).

*Proconia lucerneae* Walker (1851a, p. 785).

*Proconia marginata* Walker (1851a, p. 785).

*Proconia badia* Walker (1851a, p. 786).

*Proconia scutellata* Walker (1851a, p. 786).  
*Proconia tenebrosa* Walker (1851a, p. 787).  
*Proconia plagiata* Walker (1851a, p. 788).  
*Oncometopia alpha* Fowler (1899, p. 232).

Fig. 132. Length 13 mm. Vertex roundly right angled and two-thirds as long as basal width; color orange yellow, marked with an incomplete circle before the middle, open in front, and with light radiating lines; a marginal line from eye to apex. Anterior portion of pronotum and scutellum slate blue to black. Elytra brownish or reddish, apex distinctly lighter than basal region; anterior margins of elytra in female sometimes with a rounded granulate exudation. Female seventh sternite with posterior margin forming three equal rounded lobes. Male plates short, half the length of seventh sternite.

A species common in pastures on ironweed, *Vernonia* sp., and similar rank growth in weedy areas, *undata* is distributed throughout the eastern United States and occurs westward to Texas and North Dakota.

Illinois Records.—Many males and females, taken May 12 to November 7, are from Aledo, Algonquin, Allerton, Alto Pass, Anna, Ashley, Belleville, Cairo, Carbondale, Cave in Rock, Centralia, Champaign, Clay City, Cobden, Dix, Dixon Springs, Dolson, Dubois, East St. Louis, Edwardsville, Eic-



Fig. 132—*Oncometopia undata*.

horn, Elizabethtown, Fountain Bluff, Golconda, Goreville, Grafton, Grand Tower, Havana, Herod, Homer, Hookdale, Jonesboro, Kampsville, Kankakee, Karnak, Mahomet, Mascoutah, Momence, Mound City, Muncie, Murphysboro, Nashville, Norris City, Oakwood, Olive Branch, Olney, Pana, Pankeyville, Parker, Pine Hills, Posey, Pulaski, Rago, Richview, Seymour, Shawneetown, Springfield, Urbana, Waltersburg, White Heath, Wolf Lake, and York.

## 12. HOMALODISCA Stål

*Homalodisca* Stål (1869, pp. 60, 63).

Figs. 126, 128. Vertex and pronotum deflexed, vertex triangular, wider than pronotum, and with large prominent eyes; vertex forming an acute angle with front, which appears straight or flat when viewed laterally. Pronotum quadrangular.

Five species of this genus are known to occur in North America. Four of them are confined to the Southwest and one is found in the southern states, where it occurs from South Carolina to Arkansas and Texas. Since the state of Illinois extends southward to the junction of the Ohio and Mississippi rivers, and cotton is commonly grown in this area, it may be that *Homalodisca triquetra*, which is a common pest of cotton in the South, will be found in this area at some future time.

### 1. *Homalodisca triquetra* (Fabricius)

*Cicada triquetra* Fabricius (1803, p. 63).  
*Tettigonia vitripennis* Germar (1821, p. 61).  
*Tettigonia coagulata* Say (1832, p. 13).  
*Proconia excludens* Walker (1851b, p. 98).  
*Tettigonia ichthyocephala* Signoret (1854, p. 494).  
*Proconia admittens* Walker (1858, p. 227).  
*Proconia aurigena* Walker (1858, p. 228).

Length 13 mm. Elongate, with triangular head, which is strongly produced and bluntly angled. Vertex as long as width between eyes at base and slightly longer than pronotum; disc flat, sloping to a median furrow. Vertex, pronotum, and scutellum dark brown, finely and irregularly irrorate with yellow. Elytra each subhyaline, tinged with brown, a broad pale transverse band before middle, and a reddish spot before apical cells that extends anteriorly along the costa. Face and venter orange yellow. Female seventh sternite elongate, with produced lateral angles, between which the posterior margin is rather widely and deeply exca-

vated; male plates triangular, one-third longer than basal width, apexes acutely angled.

This species is distributed throughout the southeastern United States and is known to occur as far west as Texas.

13. *CIMINIUS* Metcalf & Bruner

*Ciminius* Metcalf & Bruner (1936, p. 944).

Related to *Kolla*. Vertex triangular, broader than long; the anterior margins continuing from the margins of the eyes; the dorsal surface sloping to meet the slightly inflated face.

I. *Ciminius hartii* (Ball)

*Tettigonia hartii* Ball (1901, p. 61).

Length 3.75–5.0 mm. Short and robust, with dimorphic sex colors; female grayish brown, male shiny black. Vertex twice as wide as long. Female with ocelli and a pair of spots behind them black; anterior part of vertex darker, with a light spot at apex; pronotum brown, anterior margin yellowish, a dark spot behind either eye; basal angles of scutellum black; elytra gray, nervures yellowish, claval margins pale blue. Male with white spot on apex of vertex; pale circles around ocelli and at apex of scutellum.

Female seventh sternite with truncate posterior margin bearing a median tooth formed by an incision on either side of center. Male plates very short, triangular, apexes blunt.

The species occurs in pasture and meadow areas and has been taken in the *Aristida gracilis* habitat. It is distributed rather abundantly through the eastern United States and occurs as far west as Texas and New Mexico.

Illinois Records.—Males and females, taken June 14 to October 2, are from Alton, Carbondale, Cave in Rock, Centralia, Cobden, Dubois, Hardin, Herod, Marshall, Metropolis, Pike, Springfield, and Vienna.

14. *KOLLA* Distant

*Kolla* Distant (1907, p. 223).

Fig. 122. Vertex subconically narrowed anteriorly, lateral margins in line with corresponding margins of eyes. Face with lateral areas somewhat strongly and transversely striate. Antennae long.

Two species are recorded in this genus

for the United States, and both occur in Illinois.

KEY TO SPECIES

- Length at least 5.5 mm.; nervures of elytra broad and black . . . . . 1. *bifida*
- Length not exceeding 5.0 mm.; elytra dark green, without broad black nervures. . . . . 2. *geometrica*

1. *Kolla bifida* (Say)

*Tettigonia bifida* Say (1831, p. 313).

*Tettigonia tenella* Walker (1851a, p. 770).

Fig. 133. Length 5.5–6.0 mm. Green, with white transverse bands on head and pronotum, nervures of elytra black. Vertex



Fig. 133.—*Kolla bifida*.

bluntly conical, short, almost twice as wide as long, black; two white spots at apex, a transverse white band across disc, and another on posterior margin. Face black. Pronotum margined with a black band anteriorly, posterior margin white, with a black band just anterior to it; disc green. Elytra green, nervures black, apexes smoky. Female seventh sternite with posterior margin roundedly produced at middle. Male plates short, triangular, apexes slightly produced.

A common meadow and pasture species, especially abundant on coarse grasses in moist areas, *bifida* is distributed throughout

the eastern states and occurs as far west as Kansas and Nebraska.

**Illinois Records.**—Many males and females, taken June 14 to October 20, are from Aldridge, Algonquin, Alton, Apple River Canyon State Park, Carbondale, Cave in Rock, Channel Lake, Clay City, Dolson, Dongola, Dubois, Elizabethtown, Fern Cliff, Fountain Bluff, Grafton, Grand Detour, Grand Tower, Herod, Kampsville, Kankakee, Karnak, Lima, Metropolis, Mount Carmel, Muncie, Newton, Oak Lawn, Oakwood, Quincy, Rock Island, Savanna, Shawneetown, Urbana, Valley City, Vienna, Watson, and White Heath.

## 2. *Kolla geometrica* (Signoret)

*Tettigonia geometrica* Signoret (1854, p. 12).  
*Tettigonia psittacella* Fowler (1900, p. 290).

Length 4.5–5.0 mm. In general appearance similar to *bifida* but smaller; elytra without black nervures. Vertex black, marked with two apical spots and two transverse bright yellow bands as in *bifida*. Face black. Pronotum and scutellum marked as in *bifida*. Elytra bright green, nervures faintly black, apexes smoky; each with three light spots anterior to smoky area and costal margin. Female seventh sternite with rounded posterior margin. Male plates short, triangular.

A common pasture and meadow species, especially in moist areas, *geometrica* is distributed in the southern states from the District of Columbia to Arkansas and Missouri.

**Illinois Records.**—Males and females, taken May 7 to September 24, are from Alto Pass, Dixon Springs, Dolson, Fern Cliff, Herod, Jonesboro, Karnak, Ozark, Rago, Urbana, and Vienna.

## 15. *HELOCHARA* Fitch

*Helochara* Fitch (1851, p. 56).

Fig. 131. Head wider than thorax, much broader than long, slightly and obtusely angled, and conical. The reflexed portion of the front elevated and prominent. Profile of face convex. Pronotum very long, hexangular, resembling the pronotum of *Aulacizes*; lateral margins short. Scutellum very small. Each elytron coriaceous, veins distinct, raised, with three antepical and five apical cells.

Two species belonging to the genus are known in North America. One of them is

known only from California. The other is common throughout most of the United States.

## 1. *Helochara communis* Fitch

*Helochara communis* Fitch (1851, p. 56).  
*Tettigonia herbida* Walker (1851a, p. 769).

Length of female 6.0–7.0 mm.; male 4.0–5.5 mm. Usually dark green, but often pale green or yellowish, with a dark green stripe along claval suture. Eyes, ocelli, and concentric lines on reflexed portions of front dark. Male face black, female face green, marked with black arcs. The vertex is obtusely angled, blunt on margin, the reflexed portion of front prominent on vertex. Female seventh sternite with posterior margin slightly produced at middle. Male plates triangular, finger-like. Each antenna of male enlarged toward apex, fig. 131.

This is a very common species and probably the one taken most abundantly along stream margins, in low marshy grasses, or in wet meadows. It is transcontinental in distribution.

**Illinois Records.**—Many males and females, taken May 10 to October 17, are from Algonquin, Apple River Canyon State Park, Atlas, Beach, Cave in Rock, Fox Lake, Freeport, Fulton, Galena, Havana, Harvard, Momence, Mount Carmel, Oak Lawn, Oquawka, Palos Park, Princeton, Rock Island, Sheffield, Spring Grove, Sun Lake, Urbana, and Volo.

## 16. *CARNEOCEPHALA* Ball

*Carneocephala* Ball (1927, p. 39).

Fig. 125. Resembling *Draeculacephala* in general appearance and in the character of the reticulate apical portion of the elytra but differing by having the front inflated and conically rounded to the vertex. The vertex lacks the definite margin found in *Draeculacephala*; front mottled with tawny. Pronotum long, inclined to be hexangular.

Eight species are recorded by Nottingham (1932) and Knull (1940) as occurring in the United States; two of these occur in the East. Only one is known from Illinois.

## 1. *Carneocephala flaviceps* (Riley)

*Diedrocephala flaviceps* Riley (1880, p. 78).

Length of female 5.0–6.0 mm., male 4.5–5.0 mm. Dull greenish, elytra conspicuously



marked by white veins, apices pale gray or smoky, reticulate veined. Vertex bluntly angled, fulvous, marked with white. Pronotum yellowish anteriorly, disc green. Face fulvous tinted with pink. Female seventh sternite with a broad slightly produced median lobe. Male plates broad, gradually tapered to rather blunt apices, each bearing a finger-like process.

A common grass-feeding species, *flaviceps* occurs throughout the southern United States and is distributed from coast to coast. Although it is known in Illinois only in the southern part, there are records of its occurrence in Wisconsin.

**Illinois Records.**—CAVE IN ROCK: Oct. 2, 1934, Ross, 4♂, 2♀. DIXON SPRINGS: July 29, 1934, DeLong & Ross, 2♂, 1♀. HARRISBURG: at light, June 15, 1934, DeLong & Ross, 1♀; Aug. 3, 1934, DeLong & Ross, 1♂, 1♀. HORSESHOE LAKE: at light, July 10, 1933, Ross & DeLong, 2♂, 1♀. LAWRENCEVILLE: Sept. 7, 1933, Ross & Mohr, 1♀. METROPOLIS: Aug. 20, 1916, 2♂, 4♀. VIENNA: June 14, 1934, DeLong & Ross, 1♂, 3♀; Aug. 3, 1934, DeLong & Mohr, 2♂.

### 17. *GRAPHOCEPHALA* Van Duzee

*Graphocephala* Van Duzee (1916, p. 66).

Fig. 116. Head narrower than pronotum, eyes small, vertex almost flat, roundedly angled, apex obtusely rounded, margin sharp, acute, and dark lined. Front broad, appearing flat above in profile. Pronotum broadest across lateral angles, strongly curved in front, the side margins continuous with the curve of anterior margin. This genus contains some highly colored species that can be distinguished readily from the related *Ciminius* by the dark marginal band on the vertex.

Four species are known to occur in the United States; two of them are confined to the Southwest and two occur in the eastern states. One is northern and the other is southern in distribution, and both are found in Illinois.

#### KEY TO SPECIES

Vertex yellow, with a black band on anterior margin; length 8 mm. or more. . . . .

#### 1. *coccinea*

Vertex yellow, a black line just back of margin and parallel to it, and a pair of proximal longitudinal lines on disc; length 6 mm. or less. . . . .

#### 2. *versuta*

### 1. *Graphocephala coccinea* (Forster)

*Cicada coccinea* Forster (1771, p. 69).  
*Tettigonia quadrivittata* Say (1831, p. 312).  
*Tettigonia picta* Walker (1851a, p. 758).

Length 8–9 mm. Pronotum and elytra red, marked with green longitudinal stripes; a broad median stripe on posterior portion of pronotum and a pair of oblique green stripes from the humeral angles. Elytra red; with claval suture, costal margin, a median stripe on corium, and the sutural margin before the middle of each green. Face and vertex yellow, a broad black band just beneath margin of vertex. Scutellum yellow. Female seventh sternite with posterior margin produced and rounded. Male plates long, concavely narrowed, attenuate, apices acute.

This is one of the largest, most conspicuously marked, and most common species of the North American leafhopper fauna. It usually occurs in abundance upon *Rubus* and is frequently found in all stages upon certain species of ornamental shrubs such as *Forsythia*. It often occurs in sufficient numbers to cause economic injury to ornamental plants. It is distributed throughout the eastern United States and occurs as far west as Texas and Oklahoma.

**Illinois Records.**—Many males and females, taken June 1 to October 21, are from Algonquin, Anna, Antioch, Apple River Canyon State Park, Atlas, Bluffs, Burton, Channel Lake, Chicago, Dixon, Dixon Springs, Dolson, Dubois, Eichorn, Elizabethtown, Galena, Galesburg, Golconda, Grafton, Grand Detour, Grandview, Grand Tower, Hardin, Harrisburg, Harvard, Havana, Herod, Homer, Justice, Kankakee, Keithsburg, Karnak, La Grange, Lawrenceville, Mahomet, Monticello, Mound City, Mount Carmel, Muncie, New Milford, Newton, Normal, Oakwood, Oregon, Palatine, Palos Park, Pulaski, Putnam, Quincy, Rock Island, Rosiclare, Savanna, Shawneetown, Starved Rock State Park, Temple Hill, Urbana, Vienna, Villa Ridge, Volo, Warren, Warsaw, Watson, Wauconda, White Heath, and White Pines Forest State Park.

### 2. *Graphocephala versuta* (Say)

*Tettigonia versuta* Say (1831, p. 311).  
*Tettigonia redاتا* Fowler (1900, p. 276).

Length 5–6 mm. Similar in color markings to *coccinea* but smaller in size. Vertex yellow, a black stripe on front just below

margin, a pair of median proximal black lines joined anteriorly with a pair of oblique black lines, which are almost parallel with anterior margins. Pronotum yellow at apex and along sides, and green posteriorly. Scutellum yellow or reddish, with black longitudinal lines. Elytron green or blue, a red stripe on either side of a blue stripe on claval suture; apical margin and posterior portion of costa pale yellow, with dark spots around apex. Female seventh sternite with posterior margin angularly produced, concave laterally. Male plates concavely narrowed to pointed apices, which are dark at tips and slightly turned up.

This species is especially abundant in the southern United States and occurs in southern Illinois and as far west as Texas. It is usually found in grassy and other types of herbaceous vegetation.

**Illinois Records.**—Many males and females, taken May 7 to November 13, are from Alto Pass, Anna, Anvil Rock, Borton, Browns, Cache, Carbondale, Carmi, Cave in Rock, Chester, Dixon Springs, Dongola, Dubois, Eichorn, Elizabethtown, Fountain Bluff, Gibsonia, Golconda, Grand Tower, Harrisburg, Herod, High Knob, Homer, Jonesboro, Karbers Ridge, Karnak, Makanda, Marshall, Metropolis, Mount Carmel, Norris City, Pounds, Pulaski, Quincy, Rosiclare, Shawneetown, Thebes, Urbana, Valley City, Vienna, Villa Ridge, Watson, Wichert, and White Heath.

## 18. *Plesiommata* Provancher

*Plesiommata* Provancher (1889, p. 263).

Fig. 119. Slender, elongate in form. Vertex strongly produced and bluntly angled, more than two-thirds as long as basal width between eyes. Ocelli equidistant between posterior and lateral margins of vertex. Dorsal surface of vertex not deflexed, anterior portion gently rounded to apex and bluntly angled with front.

Only two species are known in this genus. One is recorded from Arizona. The other, *tripunctata*, is eastern in distribution. It was described as belonging to *Tettigonia* by Fitch (1851) and referred to *Kolla* by Van Duzee (1912). Van Duzee (1917) placed it in *Pagaronia*, a genus of larger western species. Oman (1938b), in a revision of the tribe Errhomenellini, placed it in *Plesiommata*, a genus erected for it when it was redescribed by Provancher.

## 1. *Plesiommata tripunctata* (Fitch)

*Tettigonia tripunctata* Fitch (1851, p. 55).  
*Plesiommata biundulata* Provancher (1889, p. 263).

Length 5 mm. White, marked with dark brown or black. Vertex conically pointed, with three black spots, one at apex and one enclosing each ocellus. Reflexed portion of face often marked with brown arcs. Margins of pronotum with brown lines, two transverse bands on disc. Elytral margins, nervures, and claval sutures with narrow brown lines. Posterior margin of female seventh sternite truncate or slightly rounded. Male plates broad at base, triangular, apices produced, forming attenuate tips.

A common species in open wooded areas on *Muhlenbergia* and similar herbaceous plants, *tripunctata* is distributed throughout the eastern United States and as far west as Missouri.

**Illinois Records.**—Males and females, taken February 1 to October 16, are from Aldridge, Apple River Canyon State Park, Dolson, Grand Tower, Herod, Normal, Thomson, Urbana, Vienna, and White Heath.

## 19. *DRAECULACEPHALA* Ball

*Draeculacephala* Ball (1901, p. 66).

Fig. 124. Vertex triangularly produced, bluntly pointed, frequently depressed just back of apex of vertex and flat or concave on anterior discal portion. Pronotum equaling width of head or narrower. Elytra long, narrowed apically, greenish, nervures raised, often paler, the apical and antepical cells irregularly reticulate veined. The vertex anterior portion of pronotum, and scutellum are usually a shade of yellow, and the disc of pronotum and the elytra are dark green. All the members of this genus are similar in color pattern.

These leafhoppers are found in meadows, marshes, and swamps and occur on grasses and sedges, usually in abundance. Fourteen species have been recorded for North America in the various revisions of Van Duzee (1915a), Ball (1927), and Ball & China (1933). Nine forms have been collected in Illinois.

### KEY TO SPECIES

1. Anterior portion of pronotum with black or brown vermiculate markings . . . 2
- Anterior portion of pronotum pale yellow

- or green, without definite dark vermiculate markings. . . . . 3
2. Markings on vertex and pronotum black, prominent; males not exceeding 6 mm., females not exceeding 8 mm. in length
1. *inscripta*  
 Markings on vertex and pronotum usually brownish, not prominent; males at least 8 mm., females at least 10 mm. in length . . . . . 6. *portola* var. *pallidosa*
3. Vertex short in males; apex blunt, rounded margin thickened anteriorly; conspicuous black spots at apex and next to eyes . . . . . 4
- Vertex usually more angularly produced and acute; dark spots at apex small or faint, lines on vertex faint or narrow . . . . . 5
4. Male with a pair of black spots at apex of vertex and a spot just back of apex on meson. Female with vertex one-fourth wider than long, markings often faint . . . . . 2. *prasina*  
 Male with a pair of black spots at apex and a spot next to each eye; median spot absent. Female with vertex almost as long as basal width, markings usually dark, conspicuous . . . . . 3. *angulifera*
5. Females . . . . . 6  
 Males . . . . . 8
6. Length 9.0-10.0 mm. . . . . 7  
 Length 7.5-8.0 mm. . . . .
8. *constricta* and 7. *mollipes*  
 Length 10 mm.; vertex about as long as basal width between eyes . . . . .
5. *portola* and 4. *producta*  
 Length 9 mm.; vertex decidedly longer than basal width between eyes . . . . . 9. *antica*
8. Aedeagus with the ventral process of the dorsoposterior portion abruptly rounded from narrow basal stalk to form a rounded apical portion, as in figs. 148, 150 . . . . . 9  
 Ventral process not abruptly widened, more sloping, narrower and more elongate, as in fig. 143 . . . . . 10
9. Aedeagus, fig. 148, with terminal portion as wide as long and subangulate on the sides near neck . . . . . 5. *portola*  
 Aedeagus, fig. 150, with terminal portion longer than wide and nearly evenly rounded on sides between neck and apex . . . . . 4. *producta*
10. Apex of ventral process, fig. 143, narrowed and bluntly angled . . . . . 7. *mollipes*  
 Apex of ventral process rounded and notched, as in figs. 147, 149 . . . . . 11
11. Ventral process, fig. 149, appearing in ventral view narrowly notched either side near base, gradually widened from notch to apex, which is broadly rounded either side of a deep notch; long slender processes from ventroanterior portion straight, not curved at apex . . . . . 9. *antica*  
 Ventral process, fig. 147, broadly, concavely rounded either side at base, widened on apical half, broadly rounded at apex, with a slight median notch; long slender processes from ventroanterior portion curved dorsally at apex . . . . . 8. *constricta*

1. *Draeculacephala inscripta* Van Duzee

*Draeculacephala inscripta* Van Duzee (1915a, p. 180).

Length of female 8 mm., male 6 mm. Short headed, with prominent black markings on vertex and anterior portion of pronotum. Vertex bluntly pointed, in both sexes decidedly wider between eyes than median length. Scutellum and anterior portion of pronotum yellow; disc of pronotum and elytra dark green; vertex with three broad curved black arcs between each eye and apex, a median black longitudinal line, a black oblique line anterior to median longitudinal line, a black oblique line anterior to and another posterior to ocellus, and a black spot between ocellus and eye. Pronotum one-fourth longer than vertex. Anterior portion marked with heavy black vermiculate lines. Scutellum with two round black spots on anterior portion of disc.

Posterior margin of female seventh sternite produced at median one-fourth with apex rounded, then concavely rounded on each side. Male plates rather long, triangular, gradually narrowed to rounded and up-turned apices. Styles, fig. 144, elongate, each broad near base, narrowed toward apex, with apical fifth bent inward, sloping to pointed apex, which is turned upward. The ventroanterior part of aedeagus bears two pairs of processes; the dorsal pair medium in length and heavy, the ventral pair slender and long, almost enclosing remainder of aedeagus. The dorsoposterior portion also bears a pair of dorsally directed processes at base, and a ventral portion, which is about one-third as wide as long (in ventral view), narrow at base for about one-fourth its length, then rapidly broadened and rounded to a blunt produced apex. Pygofers as in fig. 136*A*.

This species is distributed throughout the southeastern states and has been found in southern Ohio and southern Illinois.

Illinois Records.—KARNAK: Aug. 8, 1934, Ross, DeLong, & Mohr, 2 ♀. NORRIS CITY: on *Jussiaea diffusa*, Sept. 9, 1933, Ross & Mohr, 12 ♂, 12 ♀.

2. *Draeculacephala prasina* (Walker)

*Tettigonia prasina* Walker (1851a, p. 768).  
*Aulacizes noveboracensis* Fitch (1851, p. 56).

Length 8.0-8.5 mm. Blunt headed, with a pair of heavy black spots at apex of yellow vertex, and a black spot just in front of

each eye along margin, these spots usually larger in male than in female. Pronotum with anterior margin yellow, posterior portion dark green. Scutellum yellow, elytra green. Vertex bluntly angled, in male one-third wider between eyes than median length and decidedly shorter than pronotum. In female one-fourth wider between eyes than median length and about as long as pronotum.

Female seventh sternite long, with rather prominent lateral angles, between which the posterior margin is concavely rounded either side of a median produced apical fourth, the latter blunt at apex. Male plates appearing rather short and triangular, but each with blunt rounded upturned apex. Styles, fig. 145, long and narrow, each with the apical half curved dorsally and then caudally and sharp pointed at apex; ventroanterior portion of aedeagus with a pair of dorsally directed divergent processes and a pair of ventral processes that are curved outward, dorsally, and then caudally, enclosing the dorsoposterior portion of the aedeagus; the latter portion with a pair of dorsally directed processes and a ventral portion. The ventral portion is short and bears a pair of apical processes that are directed basad and are almost as long as the portion to which they are attached. Pygofer as in fig. 138*A*.

This is a common transcontinental species and is found in the United States from coast to coast.

**Illinois Records.**—Males and females, taken May 14 to October 5, are from Algonquin, Alsip, Amboy, Antioch, Champaign, Des Plaines, Fox Lake, Grand Detour, Ingleside, Lake Villa, McHenry, Moline, Orangeville, Savanna, Sun Lake, Waterman, Wauconda, Waukegan, and Zion.

### 3. *Draeculacephala angulifera* (Walker)

*Tettigonia angulifera* Walker (1851a, p. 771).  
*Draeculacephala manitobiana* Ball (1901, p. 70).

Length of female 8.5 mm., male 7.5 mm. Large, yellow and green, with a short bluntly angled head and distinctive genitalia. Vertex in male distinctly wider between eyes at base than median length; in female slightly wider at base than median length. Vertex, anterior portion of pronotum, and scutellum yellow. Posterior half of pronotum and elytra dark green. Male with a black spot on either side of apex

of vertex from which arise four parallel marginal lines; large triangular black spot just back of apex, from the base of which a diagonal heavy black line extends to each ocellar suture; from each line a broad stripe branches, extends inside of ocellus; in female, spots on either side of apex are much smaller; four marginal parallel lines conspicuous; median brown line extends from near apex to base; the two oblique lines on each side are brown; the anterior line is anterior to the ocellus and the posterior line is mesad and posterior to the ocellus.

Female seventh sternite with posterior margin produced, sloping from lateral angles to form a bluntly angled apex, slightly excavated near the lateral angles on each side. Male plates triangular, each tapered from a rather broad base to a narrow pointed apex, and exceeded by pygofer, fig. 139*A*, which is almost twice as long as plate. The dorsoposterior portion of the aedeagus, fig. 146, with a pair of long processes arising at base; ventral process rather broad at base and bearing lateral spurs; process constricted near base and produced for two-thirds its length, then enlarged to form a terminal portion that bears a long process on each outer angle, which extends basally. The terminal portion is narrowed and blunt at apex.

This species ranges from Ontario and Manitoba to Colorado. It is rare in Illinois.

**Illinois Records.**—CEDAR LAKE: Aug. 6, 1906, 1 ♂, 2 ♀. CHAMPAIGN: at light, July 26, 1889, 1 ♂. LAKE VILLA: swamp, Aug. 9, 1906, 1 ♂, 4 ♀.

### 4. *Draeculacephala producta* (Walker)

*Tettigonia producta* Walker (1851a, p. 772).  
*Tettigonia acuta* Walker (1851a, p. 773).  
*Tettigonia minor* Walker (1851a, p. 772).  
*Draeculacephala cubana* Metcalf & Bruner (1936, p. 926).

Length of female 10 mm., male 7 mm. Large, resembling *mollipes* in coloration and general appearance but with distinctive male genitalia. Vertex bluntly and angularly produced, in male wider between eyes than median length and much shorter than pronotum; in female as long as basal width between eyes and as long as pronotum. Vertex, anterior portion of pronotum, and scutellum yellow, the remainder of dorsal surface dark green. The vertex marked with faint brownish lines.

Female seventh sternite with posterior margin strongly produced and concave either side of blunt apex. Male plates long and each concavely narrowed to blunt acute apex. Styles, fig. 150, short, rather broad, apical half of each curved inwardly with apex bent ventrally; aedeagus with ventro-anterior portion bearing a pair of short dorsally directed processes and a pair of long curved divergent spinelike structures that extend to apex of aedeagus, converge near apex, and have a tip bent dorsally; dorsoposterior portion also has a pair of thick dorsally directed processes and a ventral process that in ventral view is narrow at base, broadly rounded at middle, and has apex broadly curved; ventral process about two-thirds as wide as long. Pygofer as in fig. 142.

This is a common species in Illinois and is also known from California, Washington, Colorado, and Florida.

**Illinois Records.**—Many males and females, taken from May 7 to November 4, are from Algonquin, Anna, Antioch, Anvil Rock, Apple River Canyon State Park, Arlington Heights, Atlas, Belvidere, Bloomington, Cache, Cairo, Carbondale, Carlyle, Cave in Rock, Champaign, Danville, Decatur, Dixon, Dolson, Dubois, East Cape Girardeau, East St. Louis, Elizabeth, Elizabethtown, Evergreen Park, Fountain Bluff, Fox Lake, Fulton, Geff, Gibsonia, Golconda, Grafton, Grand Detour, Gulfport, Hamilton, Hardin, Harrisburg, Harvard, Havana, Herod, High Knob, Homer, Horseshoe Lake, Jonesboro, Kampsville, Kankakee, Karnak, Luther, Macomb, Makanda, Manteno, Marshall, McHenry, Metropolis, Momence, Mount Carmel, Muncie, New Holland, New Milford, Norris City, Oak Lawn, Oakwood, Ogden, Olive Branch, Oquawka, Orangeville, Palos Park, Parker, Parker City, Pike, Princeton, Pulaski, Putnam, Quincy, Rosiclare, St. Joseph, Savanna, Shawneetown, Springfield, Spring Valley, Starved Rock State Park, Texas City, Thomson, Urbana, Vienna, Villa Ridge, Volo, Waltersburg, Watson, White Pines Forest State Park, Wolf Lake, and Zion.

##### 5. *Draeculacephala portola* Ball

*Draeculacephala portola* Ball (1927, p. 35).

Length of female 9.5 mm., male 7.5 mm. In form and general appearance resembling

*producta* but with male genitalia different. Vertex rather well produced, in male as long at middle as basal width between eyes; in female a little longer at middle than basal width between eyes. Vertex, anterior half of pronotum, and scutellum yellow; vertex with a brown spot either side of apex, each spot merging with the inner of three parallel marginal brownish lines; median line and a pair of diagonal lines on disc brown; posterior half of pronotum dark green, elytra dark green with pale veins.

Female seventh sternite with posterior margin produced, gradually sloping from rounded lateral angles to form a broadly angled, bluntly pointed apex. Male plates long, narrow, triangular, exceeded in length by the pygofer. Aedeagus, fig. 148, similar to that of *producta* but having the ventral process of the dorsoposterior portion with the narrowed constricted neck portion longer, and expanded part beyond the narrowed portion more abruptly widened to form broad shoulders at the base, from which the sides slope to form the bluntly pointed apex; pygofer, as in fig. 137*A*, also broadly rounded and not constricted or narrowed before apices.

This species was described from Florida and is known from three localities in Illinois.

**Illinois Records.**—MUNCIE: cattail bog, April 7, 1937, D. T. Ries, 1 ♀. SPRING VALLEY: June 28, 1937, Ross & Burks, 1 ♀. URBANA: July 2, 1889, C. A. Hart, 1 ♀.

##### 6. *Draeculacephala portola* var. *paludosa* Ball & China

*Draeculacephala paludosa* Ball & China (1933, p. 3).

Length of female 10–11 mm., male 8 mm. In general form resembling the typical *portola* but a little larger and with irregular dark vermiculate markings on the yellow anterior one-third of the pronotum. Predominant color dark green, the vertex and scutellum yellow; dark lines on vertex prominent. Male genitalia as in *portola*, fig. 148.

This form is widely distributed from the East Coast to the West Coast and occurs upon the river bulrush, *Scirpus fluviatilis*, at the margin of fresh-water swamps and marshes.

**Illinois Record.**—BUDA: in swamp, July 12, 1937, Mohr & Burks, 1 ♀.

### 7. *Draeculacephala mollipes* (Say)

*Tettigonia mollipes* Say (1831, p. 312).

Length of female 7.5–8.0 mm., male 6.0 mm. Yellow and green, with acutely angled vertex and without conspicuous markings. Vertex produced, apex blunt, as long as or slightly longer than basal width and slightly longer than pronotum. Vertex, anterior portion of pronotum, and scutellum yellow, posterior portion of pronotum and elytra dark green. Vertex faintly marked with narrow brownish lines.

Female seventh sternite with posterior margin concavely and roundedly produced either side of a median produced rounded apex. Male plates long, each concavely tapered to a narrow rounded divergent apex. Styles, fig. 143, short, each rather broad at middle of apical portion, bent inwardly, and outer margin concavely rounded to pointed apex; ventroanterior portion of aedeagus with a pair of rather short thick dorsally directed processes and a pair of long spinelike ventral processes that diverge and extend caudally to tip of aedeagus, with their apices curved dorsally; dorsoposterior portion with a pair of dorsally divergent processes and a ventral process that in ventral view appears elongate, about one-third as wide as long, with narrow base and narrow bluntly pointed apex. Pygofers as in fig. 141*A*.

This is a widely distributed species throughout the United States.

**Illinois Records.**—Males and females, taken June 10 to October 6, are from Apple River Canyon State Park, Carmi, Dixon Springs, Dolson, Farina, Gulfport, Harrisburg, Herod, High Knob, Jonesboro, Karnak, Mount Carmel, Muncie, Norris City, Princeton, Shawneetown, Springfield, Temple Hill, Vienna, Watson, and White Heath.

### 8. *Draeculacephala constricta* Davidson & DeLong

*Draeculacephala constricta* Davidson & DeLong (1943, p. 193).

Fig. 134. Length of female 8.0 mm., male 6.5 mm. Resembling *mollipes* in size, form, and color but with distinctive male genitalia. Vertex produced and bluntly angled, in both sexes as long as basal width and slightly shorter than pronotum. Vertex, anterior portion of pronotum, and scutellum yellow,

vertex marked with faint brownish longitudinal lines. Posterior portion of pronotum and elytra dark green, veins paler.

Female seventh sternite produced at apex, bluntly pointed, and concave on either side

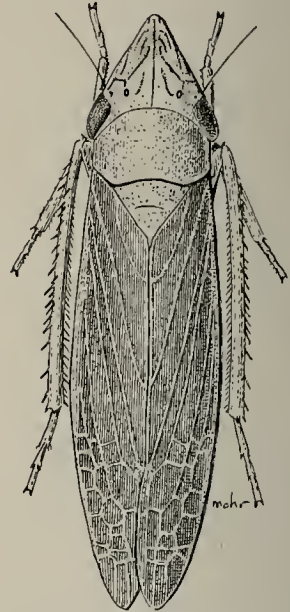


Fig. 134.—*Draeculacephala constricta*.

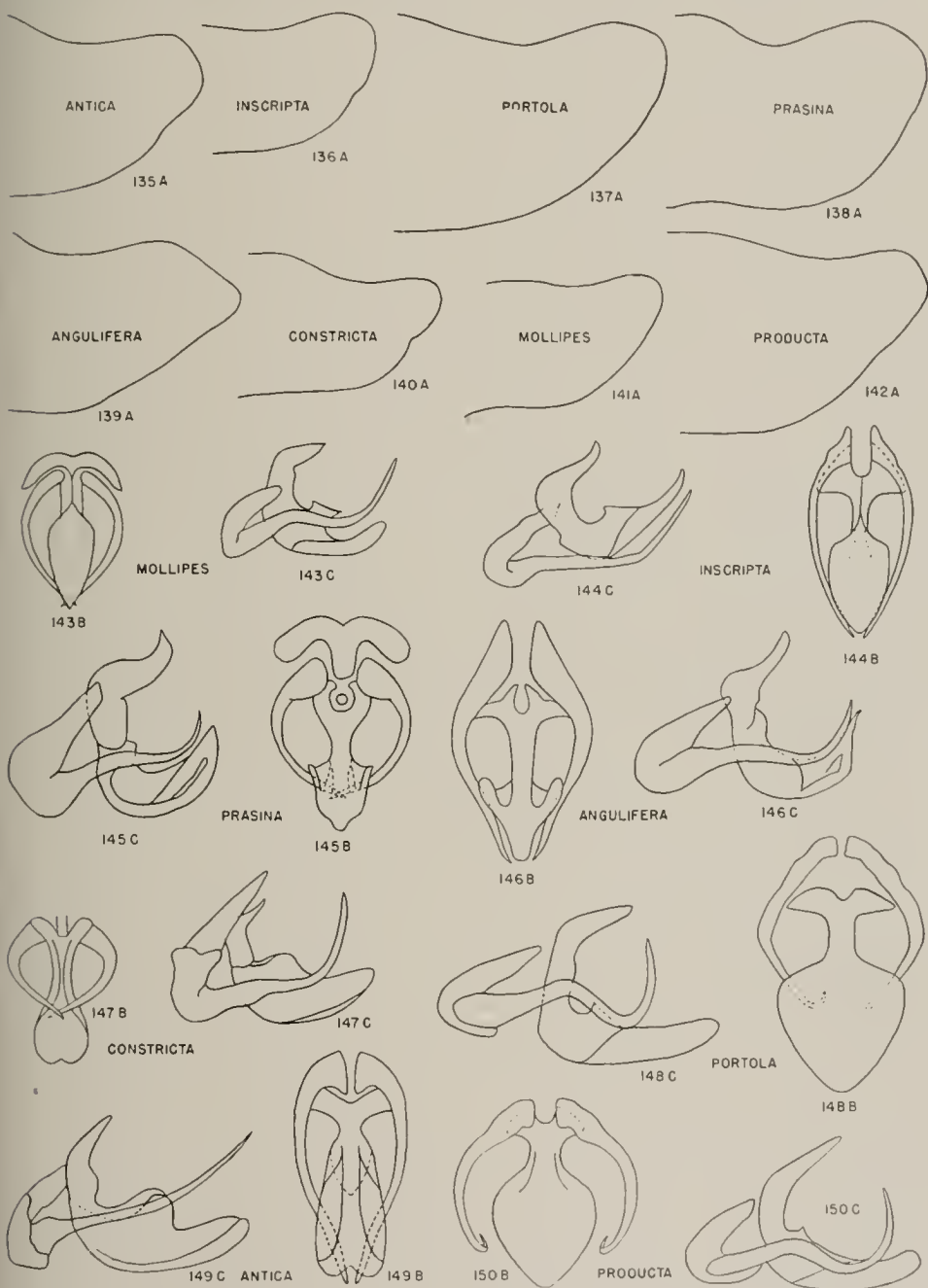
of apex. Male plates long, each reaching to tip of pygofer, concavely narrowed to acutely rounded apex. Styles, fig. 147, short, each broad at middle, apical portion bent inwardly, narrowed to pointed apex; ventroanterior portion of aedeagus with a pair of dorsally directed basal processes and a ventral pair of posteriorly directed divergent spinelike structures that extend almost to end of aedeagus and with apex that bends upward; dorsoposterior portion with a pair of dorsally directed processes and a ventral portion that is elongate, narrowed at base, convexly rounded in apical one-half and has apex broadly rounded; in lateral view ventral portion decidedly constricted just before base. Pygofers as in fig. 140*A*.

This species is found widely over the eastern and middle western states.

**Illinois Records.**—Many males and females, taken May 13 to November 3, are from Algonquin, Alton, Amboy, Anna, Antioch, Anvil Rock, Apple River Canyon State Park, Barry, Carbondale, Carmi, Cave in Rock, Champaign, Danville, Decatur, Dixon, Dixon Springs, Dolson, Dongola, Dubois,

Duncans Mills, Du Quoin, Evergreen Park, Fulton, Gibsonia, Grand Detour, Grand Tower, Grafton, Hanover, Havana, Homer, Kankakee, Kimmundy, Loda, Macomb, Marshall, McHenry, Metropolis, Monmouth,

Mount Carmel, Oak Lawn, Oakwood, Oquawka, Orangeville, Oregon, Parker, Pekin, Pike, Princeton, Pulaski, Putnam, Quincy, St. Anne, St. Joseph, Savanna, Seymour, Shawneetown, Sheffield, Springfield,



Figs. 135-150.—*Draculacephala*, male genitalia. A, pygofer; B, ventral aspect; C, lateral aspect.

Starved Rock State Park, Taylorville, Thomson, Urbana, Vienna, Wauconda, Waukegan, Weldon Springs, White Pines Forest State Park, and Zion.

### 9. *Draculacephala antica* (Walker)

*Tettigonia antica* Walker (1851a, p. 771).

Length of female 9 mm., male 7 mm. In general appearance resembling *mollipes* but with vertex more strongly produced and with distinctive male genitalia. Apex of vertex bluntly angled, in male slightly longer than basal width between eyes and as long as pronotum; in female decidedly longer than basal width between eyes and longer than pronotum. In color similar to *mollipes*: vertex yellow with faint brownish lines, anterior portion of pronotum and scutellum yellow, without markings.

Female seventh sternite with posterior margin concavely and roundedly produced to a median rounded produced apex. Male plates long, concavely rounded to acute rounded apices. Styles, fig. 149, rather short, apical half of each strongly sloping inwardly and narrowed to pointed apex that curves ventrally and slightly outwardly; ventroanterior portion of aedeagus with a pair of dorsally directed processes and a pair of ventral caudally directed spinelike structures that are as long as apex of aedeagus, divergent at base, converging near apex, and not bent dorsally; dorso-posterior portion with a basal pair of dorsally directed processes and a ventral portion that is narrow at base, broadened at middle, then tapered to a pair of blunt pointed processes at apex, this process elongate and about one-third as wide as long. Pygofers as in fig. 135A.

This species is found abundantly in the eastern United States.

**Illinois Records.**—Many males and females, taken May 4 to September 18, are from Adair, Albion, Amboy, Apple River Canyon State Park, Cache, Carbondale, Cary, Cave in Rock, Champaign, Des Plaines, Dixon, Dixon Springs, Dolson, Dongola, Elizabethtown, Fern Cliff, Fox Lake, Fulton, Grand Detour, Grand Tower, Havana, Herod, Homer, Jonesboro, Kankakee, Karnak, Litchfield, Monticello, Muncie, Normal, Oakwood, Oquavka, Pike, Princeton, Pulaski, Rago, St. Joseph, Taylorville, Thebes, Urbana, Vienna, Villa Ridge, Volo, Warren, and Wolf Lake.

### 20. *NEOKOLLA* Melichar

*Neokolla* Melichar (1926, p. 343).

Fig. 31. Head bluntly conical, slightly sloping, eyes and ledge over antennal sockets not prominent. Both front and vertex convex, merging without a perceptible margin separating them. Pronotum broadest at lateral angles. Elytra covering the tergum of abdomen.

Most species of *Neokolla* are known from the West or Southwest only. One is recorded from Quebec only. Two of the three eastern species are known to occur in Illinois. The other, a widely distributed species, may at some time be found in the southern part of the state.

#### KEY TO SPECIES

Black bars or lines, if present, on posterior portion of vertex, transverse; scutellum marked with black. . . . . 1. *hieroglyphica*  
Black lines on posterior margin of vertex longitudinal; scutellum faintly marked . . . . . 2. *gothica*

#### 1. *Neokolla hieroglyphica* (Say)

*Tettigonia hieroglyphica* Say (1831, p. 313).

Length 5.0–6.5 mm. This species varies in color from pale green and red to mostly black. The black form has been described as the variety *dolobrata* (Ball) (1901, p. 52), but some intergrades appear to connect the extremes. The lighter colored forms are blunt headed, stout, greenish through red to grayish, and with a black spot on apex of vertex; spot encircled by white; two divergent lines before middle not meeting at center; ocelli and a circle either side of disc at base black. Pronotum pale anteriorly, darker posteriorly, with light markings. Elytra slate, nervures darker. The darker variety is slightly smaller than typical *hieroglyphica*, shiny black in color except for margins of clypeus, genae, a line below the lateral margin of pronotum, circle around apex of vertex, line against each eye, and center of scutellum, which are white. Central line on vertex and line from this to either eye white; claval sutures of elytra light margined.

Female seventh sternite more than twice as long as sixth sternite; posterior margin triangularly produced, apex rounded. Male plates long, triangular.

This is a common willow species, and is especially abundant along the Illinois and



Mississippi rivers. The light and dark forms occur together in most collections.

**Illinois Records.**—Many males and females, taken March 29 to November 22, are from Adair, Alto Pass, Alton, Amboy, Anna, Ashley, Barry, Beardstown, Carbondale, Cave in Rock, Collinsville, Decatur, Dixon Springs, Dubois, East St. Louis, Eichorn, Elizabethtown, Fountain Bluff, Fulton, Geff, Grafton, Grand Tower, Greenville, Golconda, Hardin, Havana, Herod, Jonesboro, Kampsville, Karnak, Litchfield, Luther, Macomb, Mattoon, McHenry, Meredosia, Metropolis, Monticello, Neoga, New Columbia, Niota, Normal, Onarga, Oquawka, Pike, Princeton, Putnam, Quincy, Rockford, Rock Island, Rosiclare, St. Anne, Seymour, Shawneetown, Sheffield, Urbana, Vienna, Watson, West Union, White Heath, and White Pines Forest State Park.

## 2. *Neokolla gothica* (Signoret)

*Tettigonia gothica* Signoret (1854, p. 345).

Length 5.5–6.0 mm. Resembling *hieroglyphica* and often confused with it. Slightly smaller, vertex marked with several lines, which appear almost parallel. Vertex slightly conical, margins rounded, reddish or greenish yellow; apex black, surrounded by a pale circle; margins of reflexed portions, a line from this to ocellus, and a loop from the base either side light. Areas within these lines black. Scutellum light with dark markings. Elytra dirty green, nervures light. Female seventh sternite with posterior margin triangularly produced. Male plates long triangular.

This is a very common species in cut-over areas composed of shrubs and luxuriant growth of herbaceous vegetation. It is distributed throughout the eastern United States, and occurs as far west as Kansas and Texas.

**Illinois Records.**—Many males and females, taken March 29 to November 27, are from Aldridge, Alton, Alto Pass, Apple River Canyon State Park, Ashley, Bluffs, Champaign, Dixon Springs, Dolson, Dongola, Dubois, Elizabethtown, Galena, Grand Tower, Hardin, Havana, Herod, Mahomet, Marshall, Metropolis, Muncie, Murphysboro, Oakwood, Oliver, Oregon, Palos Park, Parker, Pike, Pounds, Quincy, Rock Island, Savanna, Urbana, Warren, Watson, White Heath, and White Pines Forest State Park.

## 21. *SIBOVIA* China

*Sibovia* China (1927, p. 283).

Fig. 118. Vertex blunt, with margins convex from eye to apex. Antennae at least half as long as body. Head and pronotum with a median and two pairs of narrow diagonal dark stripes.

One species in this genus is recorded to the United States.

### I. *Sibovia occatoria* (Say)

*Tettigonia occatoria* Say (1831, p. 311).

*Tettigonia compta* Fowler (1900, p. 271).

Length 6 mm. Long and narrow, yellow, marked with black longitudinal lines. Vertex flat, bluntly angled, as long as basal width; yellow, a black spot at apex below the margin; a black stripe arising above and on either side of this spot and extending across vertex and pronotum, and a pair of black stripes inside and parallel to them meeting on anterior part of pronotum. A median dark brown line arising at base of vertex and extending to apex of scutellum. Elytra yellow, each marked with three black stripes on corium and three on clavus; apex black. Female seventh sternite with posterior margin obtusely rounded. Male plates short, rather broad, triangular, apexes somewhat produced.

This species occurs on herbaceous vegetation in areas where luxuriant growth is found. It is known to occur from North Carolina and Florida to Texas and may eventually be collected in southern Illinois.

### Subfamily EVACANTHINAE

This group is characterized by having the ocelli just above anterior margin of vertex, and a median longitudinal carina on the face and vertex. Another carina extends from the inner margin of eye to the middle of anterior margin of vertex.

Only one genus, *Evacanthus* Le Peletier & Serville, belongs in this subfamily.

## 22. *EVACANTHUS* Le Peletier & Serville

*Evacanthus* Le Peletier & Serville (1825, p. 612).

Fig. 30. Head short and broad, vertex blunt, wider between eyes than median length, with a central longitudinal keel and a branch of keel each side from apex to eye.

Ocelli just above marginal keel and proximal to margin and not close to eyes. Front inflated, longitudinally carinate. Elytra without anteapical cells.

Only two species of the genus are known to occur in North America. One is confined to certain regions of the southeastern states, and the other occurs in Canada and across the northern portions of the United States.

### 1. *Evacanthus acuminatus* (Fabricius)

*Cicada acuminata* Fabricius (1794, p. 36).

*Cicada interstincta* Fallen (1826, p. 29).

*Amblycephalus germari* Curtis (1833, p. 192).

*Evacanthus orbitalis* Fitch (1851, p. 57).

Fig. 151. Length 5.5–6.5 mm. Robust, with very blunt head and rather short elytra. Abdomen in female extending beyond apex

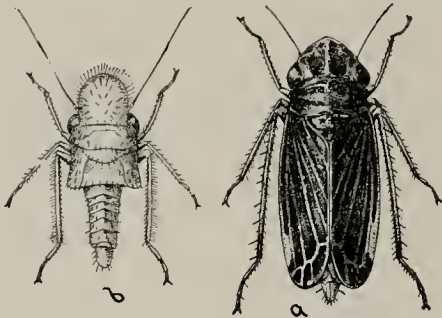


Fig. 151.—*Evacanthus acuminatus*: a, adult; b, nymph. (From Osborn.)

of elytra. Vertex with a median carina and also a carina extending from apex to either eye. Pronotum short, pubescent. Face and venter black. Female mostly testaceous on vertex and pronotum. Vertex with two black spots on disc and a row of spots on anterior portion of pronotum. Scutellum with two spots on disc. Elytra black or dark brown, with white stripes. Pubescence along nervures sparse. Female seventh sternite truncate or slightly sinuate. Male plates very long and slender, curved dorsally.

This species has been found on herbaceous vegetation in moist woodlands in the fern association.

Illinois Record.—URBANA: June 13, 1889, Hart, 1♂.

### Subfamily PENTHIMIINAE

The short ovate body with distinctly depressed vertex and broadly overlapping fore-

wings at the apex characterize members of this group.

One genus only, *Penthimia*, belongs to this subfamily.

### 23. *PENTHIMIA* Germar

*Penthimia* Germar (1821, pp. 38, 46).

Fig. 152. Short, broad, ovate, well rounded anteriorly and posteriorly. Vertex broad, short, broadly rounded. Head, including eyes, narrower than pronotum. Pronotum rather long, distinctly and transversely striate. Body broad, very short, elytra exceeding abdomen in length; slightly more than twice as long as wide, apex of each clavus truncate, appendix broad.

Lawson (1933) records two species for the United States. One of them is known only from Florida. The other occurs in the northern United States and is distributed through the East and westward to Colorado.

### 1. *Penthimia americana* Fitch

*Penthimia americana* Fitch (1851, p. 57).

*Penthimia vicaria* Walker (1851a, p. 841).

*Penthimia picta* Provancher (1872, p. 352).

Fig. 152. Length 5–6 mm. Short, broadly oval, in general appearance resembling a cercopid, reddish brown to black in color, with minute brown spots. Female seventh sternite slightly notched either side on posterior margin, forming a median lobe. Male plates broad, triangular.

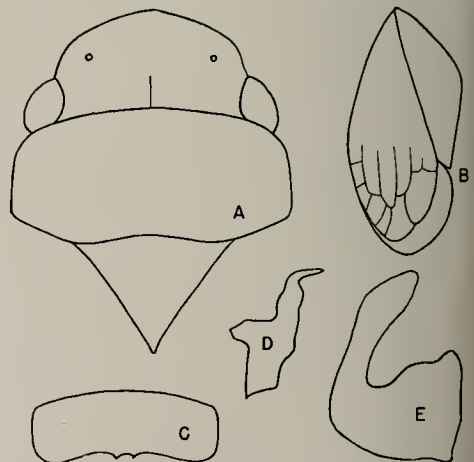


Fig. 152.—*Penthimia americana*. A, head and pronotum; B, elytron; C, female seventh sternite; D, E, male genitalia.

This species is widely distributed but not abundant and seems to be associated with shrubs in wooded and cut-over areas. It has frequently been taken from oak.

**Illinois Records.**—DUBOIS: May 21, 1917, 1♂; Aug. 10, 1917, 4♂. MAHOMET: June 30, 1912, 1♀. MEREDOSIA: May 29, 1917, 1 nymph. MUNCIE: May 27, 1905, 1♀. NORTHERN ILLINOIS: June, 1♀. OREGON: June 21, 1917, 1♀. SAVANNA: June 11, 1917, 1♀; June 12, 1917, 1♂. URBANA: in woods, May 7, 1888, 1♀; May 27, 1890, Hart, 1♀.

### Subfamily GYPONINAE

The members of this group are elongate, dorsoventrally flattened, and with ocelli on disc of vertex. Hind wings each with four apical cells.

This subfamily was monographed by DeLong (1942). Representatives of 5 of the 11 genera now recognized as belonging to this subfamily occur in Illinois. The other genera are chiefly southwestern.

### KEY TO GENERA

1. Elytra with numerous reticulate veins, at least on apical portions 2  
Elytra without numerous reticulate veins 3
2. Elytra rugose or roughened, often with white mottling; vertex and pronotum usually rugose 26. *Rugosana*  
Elytra with venation often prominent but not rugose or roughened; vertex and pronotum never rugose 25. *Gyponana*
3. Vertex angled with front, margin thin, sharp, or foliaceous 4  
Margin of vertex thick, not foliaceous 28. *Ponana*
4. Dorsal surface dull; head and pronotum peppered with small brown dots; vertex with three longitudinal furrows, the ocelli situated at an angle on the lateral ones; cells of elytra margined with small dots. 27. *Prairiana*  
Dorsal surface shiny and uniformly colored, or with head, pronotum, and scutellum darker than elytra; vertex without three distinct longitudinal furrows. . . . 24. *Gypona*

### 24. *GYPONA* Germar

*Gypona* Germar (1821, p. 73).

Pronotum broader than vertex, and together usually sloping from posterior margin of pronotum to anterior margin of vertex, the latter with margin thin and foliaceous. Venation of elytra simple. The species of the genus frequently exhibit sexual dimorphism in size and color. Each of the females and the males, when light in color, usually has a round black dot on the pronotum behind each eye. The males are often black and the spots are obscured. The male styles are usually broadened on apical portions and truncate.

Eight species of this genus are recorded for the United States. One is known to occur in Illinois; the others are western or southwestern in distribution.

#### 1. *Gypona melanota* Spangberg

*Gypona melanota* Spangberg (1878*b*, p. 19).

*Gypona dorsalis* Spangberg (1878*b*, p. 30).

*Gypona bipunctulata* Woodworth (1887, p. 30).

*Gypona nigra* Woodworth (1887, p. 31).

Fig. 153. Length of male 9.0 mm., female 11.5 mm. Broadly rounded vertex; sexual dimorphic coloration. Vertex twice as broad between eyes as median length. Pronotum much wider than vertex and more than twice as long. Female yellowish, with a small conspicuous black spot on each side

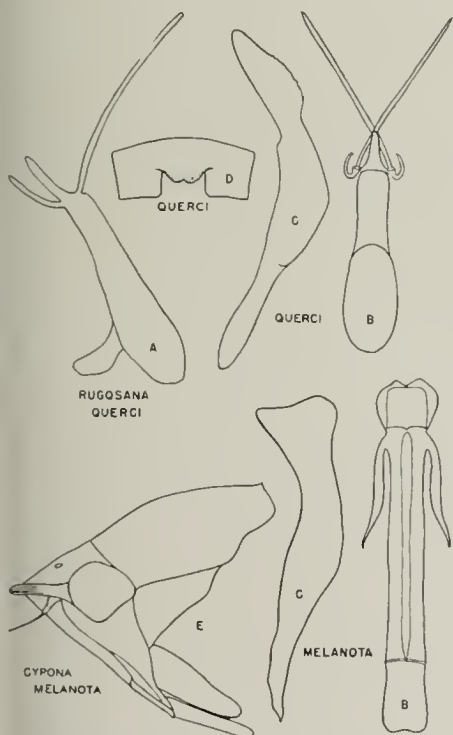


Fig. 153.—Gyponinae. *A*, lateral view of aedeagus; *B*, ventral view of aedeagus; *C*, style; *D*, female seventh sternite; *E*, head.

of outer disc of pronotum; elytra often greenish or appearing smoky. Male partially or entirely shiny black. The spots on pronotum conspicuous unless the entire pronotum is black.

Female seventh sternite broadly, angularly excavated from the produced lateral angles to form a rather broad shallow notch. Each male style somewhat narrowed between middle and broadened apical portion, which is broadly truncate on outer margin toward apex and rounded to apex on inner margin. Aedeagus broad, constricted before apex and produced and broadened to form an apical flap; just before the constriction a pair of lateral processes arise and extend basally for one-third the length of the body of the aedeagus.

This species is distributed from the New England states west to Colorado and Idaho. It occurs on low shrubs in cut-over areas and in open woodland.

**Illinois Records.**—CHAMPAIGN: July 27, 1892, Hucke, 1 ♀. OAK LAWN: July 27,

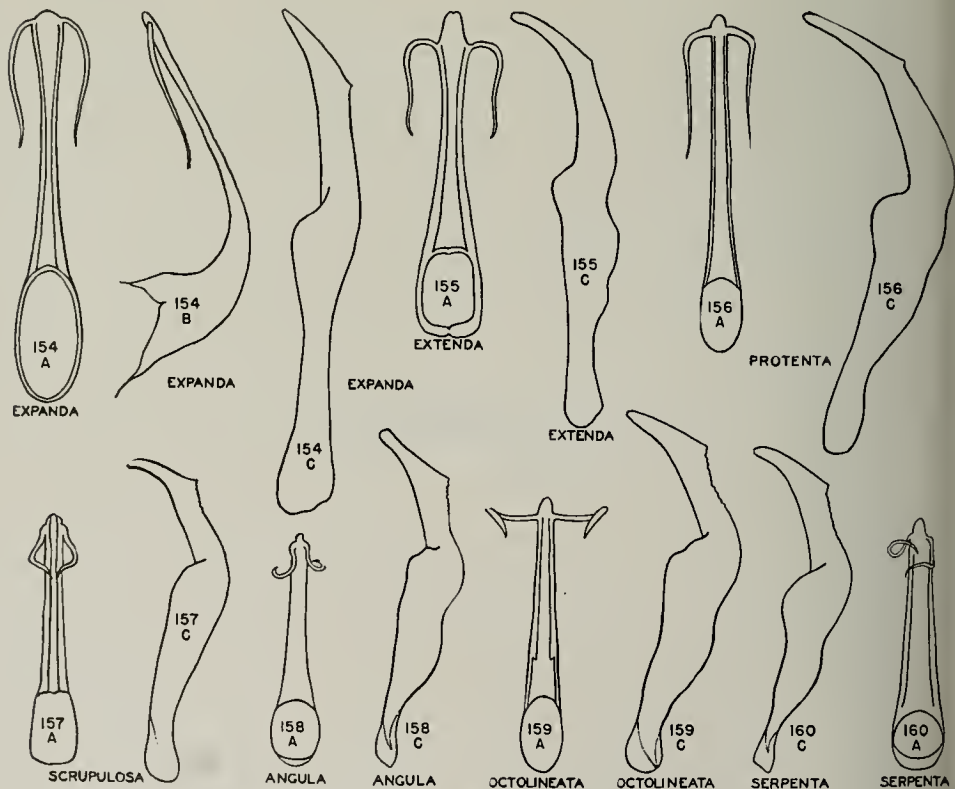
1934, DeLong & Ross, 3 ♂, 4 ♀; Sept. 6, 1935, Frison, 1 ♀. SAVOY: July 18, 1889, Hart, 1 ♂. SUMMIT: Aug. 21, 1935, DeLong & Ross, 1 ♀. TOLONO: July 25, 1895, 1 ♂.

## 25. *GYPONANA* Ball

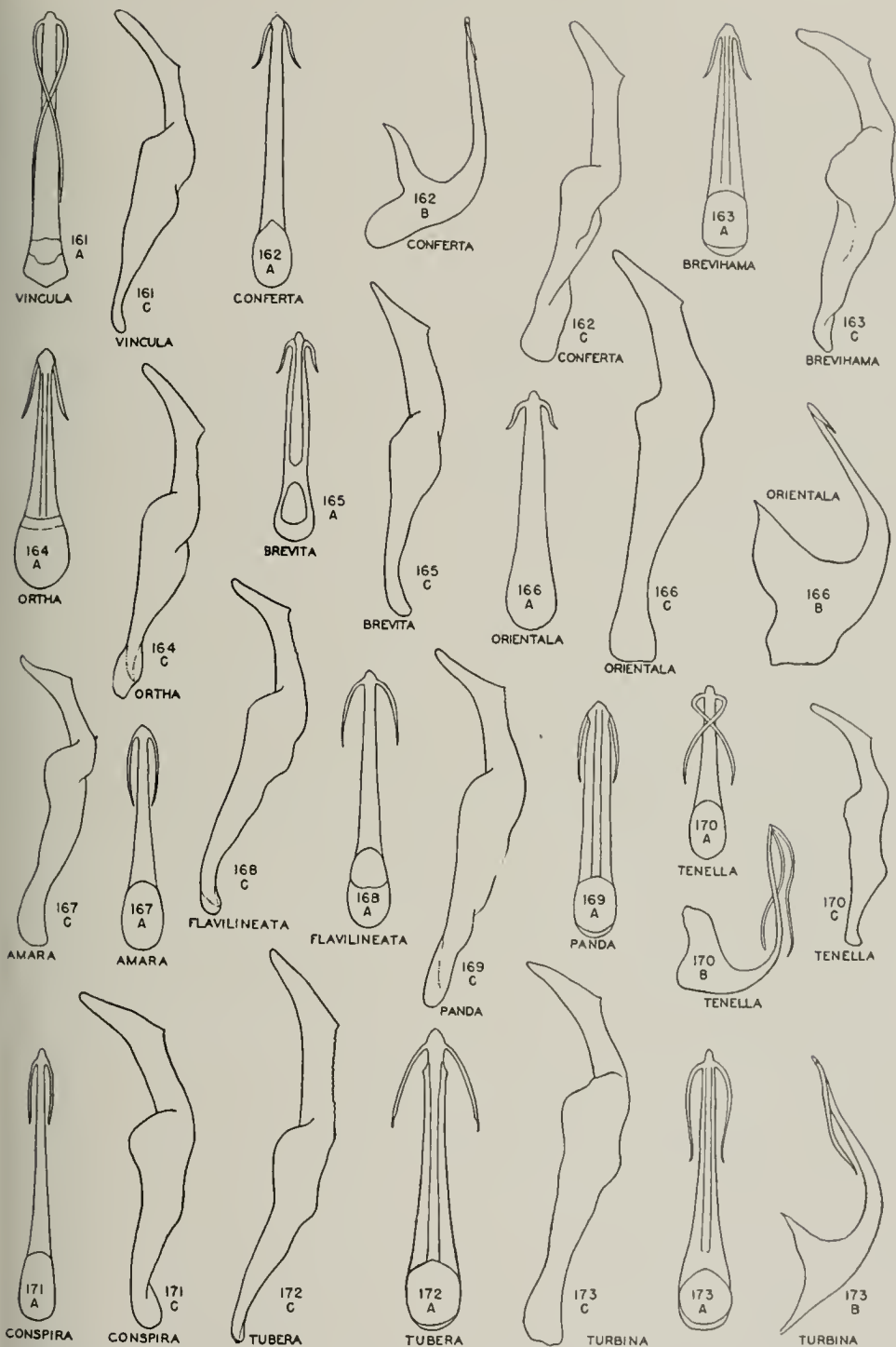
*Gyponana* Ball (1920, p. 84).

Closely related to *Gypona*. Vertex broad, flattened, and with the margin foliaceous and acutely angled with front. Pronotum broad, transverse, striated. Elytra rather long and narrow, with many irregular reticulations, especially on the apical portions.

Nearly 70 species of *Gyponana* have been recorded for the United States; of these, 19 species and a variety are known to occur in Illinois. With few exceptions they are similar in appearance. The males may be distinguished by characters of the internal genitalia, but no satisfactory characters have been found for separating the females.



Figs. 154-160.—*Gyponana*, male genitalia. A, ventral aspect of aedeagus; B, lateral aspect of aedeagus; C, style.



Figs. 161-173.—*Gyponana*, male genitalia. A, ventral aspect of aedeagus; B, lateral aspect of aedeagus; C, style.

## KEY TO SPECIES

1. Males ..... 2  
Females ..... 21
2. Aedeagus with rather short terminal processes, the apical halves of which are curved, twisted, or looped upon themselves as in figs. 157, 158 ..... 3  
Aedeagus with terminal processes of various lengths, but usually not twisted or looped upon themselves, as in figs. 155, 165 ..... 6
3. Apical portion of each style, fig. 157C, beyond the heel or spine rather narrow, almost parallel margined and curved anteriorly ..... 17. *scrupulosa*  
Apical portion of each style beyond the heel or spine broader and more gradually tapered to apex, as in figs. 158C, 159C ..... 4
4. Apical portion of each style, fig. 158C, appearing concave on both anterior and posterior portions beyond heel or spine ..... 20. *angula*  
Apical portion of each style appearing concave on anterior margin only, as in figs. 159C, 160C ..... 5
5. Anterior margin of apex of each style, fig. 159C, slightly concave ..... 18. *octolineata*  
Anterior margin more strongly concave, fig. 160C ..... 19. *octolineata* var. *serpenta*
6. Terminal processes of aedeagus one-fourth or less the length of shaft, as in fig. 165A ..... 7  
Terminal processes of aedeagus longer, one-third or more the length of aedeagus shaft, as in fig. 155A ..... 11
7. Terminal aedeagus processes less than one-fifth the length of shaft ..... 8  
Terminal aedeagus processes about one-fourth the length of shaft ..... 9
8. Each style, fig. 165C, slightly concave between spine and apex, the apex sharply pointed ..... 5. *brevita*  
Each style, fig. 166C, not concave between spine and apex, the apex more bluntly pointed ..... 6. *orientala*
9. Apical portion of each style, fig. 171C, broad at spine, tapered to one-third its width at apex ..... 8. *conspira*  
Apical portion of each style with blunt rounded apex, less strongly tapered to apex ..... 10
10. Apical portion of each style, fig. 163C, concavely curved anteriorly, convexly curved posteriorly between spine and apex ..... 3. *brevihama*  
Apical portion of each style, fig. 162C, almost straight on anterior and posterior margins between spine and apex ..... 2. *conferta*
11. Terminal aedeagus processes extending laterally, then curved at right angles and extending basally, as in fig. 155A ..... 12  
Terminal aedeagus processes curving basally from shaft, as in fig. 154A ..... 13
12. Aedeagus shaft, fig. 155A, broadened where terminal processes arise a short distance from apex; apical portion of style, fig. 155C, narrow and curved ..... 15. *extenda*  
Aedeagus shaft, fig. 156A, not widened at point where terminal processes arise; apical portion of each style, fig. 156C, straight and narrow ..... 16. *protenta*
13. Apex of aedeagus, fig. 154A, decidedly widened and broadly rounded ..... 14. *expanda*  
Apex of aedeagus not strongly widened ..... 14
14. Apex of each style bent caudally, fig. 167C ..... 11. *amara*  
Apex of each style not bent caudally ..... 15
15. Apical portion of each style narrow, as in fig. 169C, appearing almost parallel margined just before apex ..... 16  
Apical portion of each style sloping from spine to apex, not appearing parallel margined, as in figs. 172C, 173C ..... 20
16. Aedeagus shaft broad throughout, fig. 169A, posterior margin of apical portion of each style concave, fig. 169C ..... 9. *panda*  
Aedeagus shaft more slender; posterior margin of apical portion of each style not concave ..... 17
17. Processes of aedeagus more than half as long as aedeagus shaft, as in figs. 161A, 170A ..... 18  
Processes of aedeagus less than half as long as aedeagus shaft ..... 19
18. Apical portion of each style, fig. 161C, narrow, gradually tapered to a blunt apex; tooth on ventral margin not prominent ..... 1. *vincula*  
Apical portion of each style, fig. 170, narrow, almost parallel margined, apex rounded; pointed prominent tooth on ventral margin about one-fourth the distance from the apex ..... 10. *tenella*
19. Aedeagus shaft, fig. 168, narrow, terminal processes convexly curved away from shaft; apical portion of each style, fig. 168, short, straight on posterior margin ..... 7. *flavilineata*  
Aedeagus shaft, fig. 164, broad at base, narrowed toward apex, terminal processes more concavely curved and closer to shaft; apical portion of each style longer, slightly and convexly rounded posteriorly ..... 4. *ortha*
20. Aedeagus shaft, fig. 172, narrowed just before point of origin of terminal processes; apical portion of each style tapered to blunt apex ..... 12. *tubera*  
Aedeagus shaft, fig. 173, not narrowed anterior to terminal processes; apical portion of each style narrowed to a sharper pointed apex ..... 13. *turbina*
21. Vertex about two-thirds as long at middle as basal width between the eyes ..... 7. *flavilineata*, 8. *conspira*, 9. *panda*, 12. *tubera*, 13. *turbina*, 15. *extenda*, 18. *octolineata*, 20. *angula*  
Vertex shorter, about one-half as long at middle as basal width between the eyes ..... 2. *conferta*, 3. *brevihama*, 4. *ortha*, 5. *brevita*, 11. *amara*, 13. *turbina*, 16. *protenta*, 17. *scrupulosa*, 19. *serpenta*

1. *Gyponana vincula* DeLong

*Gyponana vincula* DeLong (1942, p. 47).

Length 8–10 mm. Resembling *octolineata* in form and general appearance, but male with distinctive genitalia. Vertex roundedly produced, not quite twice as wide as median length. Pale yellow, mottled with orange. Each male style, fig. 161C, with apical third slender, curved gradually dorsally and about uniform in width throughout except for a pointed tooth on ventral margin about one-fifth the distance from the blunt rounded apex. Aedeagus, fig. 161A, tapered toward apex with a pair of long slender apical processes arising just before apex and extending more than two-thirds the distance toward base of aedeagus body.

The species is distributed from Connecticut and Pennsylvania west to Utah and Texas.

**Illinois Records.**—CHAMPAIGN: Sept. 30, 1892, Snow, 1 ♀. LONG LAKE: 1 ♂. QUINCY: Aug. 8, 1889, Hart, 1 ♀. SPRINGFIELD: July 6, 1885, 1 ♂. URBANA: sweeping in forest, June 27, 1889, Hart, 1 ♀; Sept. 3, 1890, Hart & Shiga, 1 ♀; Sept. 27, 1892, Snow, 1 ♀; Oct. 17, 1892, Snow & Marten, 1 ♀.

2. *Gyponana conferta* DeLong

*Gyponana conferta* DeLong (1942, p. 24).

Length 8.5–12.0 mm. Resembling *brevihama* but with vertex more broadly rounded and each style of male more narrowed on apical fifth. Vertex more than one-half as long at middle as width between eyes. Yellowish, with pruinose coloration on elytra. Male aedeagus, fig. 162, with a pair of short terminal processes that are directed basally and slightly laterally. Each style, fig. 162C, with a sharp pointed tooth produced on outer margin at about one-fifth the distance from apex; apical portion beyond tooth bent upward and gradually tapered to a rather bluntly rounded tip.

This species is known from only Illinois and Texas, but possibly is more widely distributed.

**Illinois Records.**—Many males and females, taken June 13 to November 12, are from Belvidere, Champaign, Eichorn, Elizabethtown, Golconda, Mahomet, Oakwood, Palos Park, Rock Island, St. Joseph, Seymour, Urbana, Western Springs, and Zion.

3. *Gyponana brevihama* DeLong

*Gyponana brevihama* DeLong (1942, p. 24).

Length 9.5 mm. Resembling *octolineata* in form and general appearance but male with distinctive genitalia. Vertex rather strongly and roundedly produced, about two-thirds as long as wide. Yellowish, with eight orange longitudinal lines on vertex, pronotum, and scutellum. Each male style, fig. 163C, with broad apical portion about twice as long as broad and slightly tapered to blunt rounded apex. Aedeagus, fig. 163A, with a pair of short slightly curved lateral processes that are directed basally; they are about one-fourth as long as the straight ventral portion of the aedeagus body beyond the curved base.

This species has been taken previously in Ohio, Pennsylvania, and Mississippi.

**Illinois Record.**—HAVANA: Devil's Rock, June 22, 1926, Frison & Hayes, 4 ♂.

4. *Gyponana ortha* DeLong

*Gyponana ortha* DeLong (1942, p. 25).

Length 9.5–10.5 mm. Resembling *octolineata* in form and appearance, but male with distinctive genitalia. Vertex strongly produced and appearing narrow, about two-thirds as wide as long. Yellowish; longitudinal lines on vertex and pronotum distinct, but rather faint. Each male style, fig. 164C, with apical third gradually curved dorsally; apical fourth abruptly bent and gradually narrowed to a bluntly curved apex. Aedeagus, fig. 164A, with a pair of rather short apical lateral processes that are about one-fourth the length of the ventral body of the aedeagus and are directed basally.

This species is widely distributed from Maryland west to Wisconsin and Kansas.

**Illinois Records.**—Males and females, taken June 5 to October 3, are from Clayton, Des Plaines, Fox Lake, Grantsburg, Hardin, Jacksonville, Quincy, Reynoldsville, Springfield, Urbana, Villa Ridge, White Heath, and Wilmington.

5. *Gyponana brevita* DeLong

*Gyponana brevita* DeLong (1942, p. 27).

Length 9.5 mm. Resembling *octolineata* in form and appearance, with male genitalia distinctive. Vertex rather broadly rounded,

twice as wide as long. Yellowish, with pale irregular longitudinal stripes on the vertex, pronotum, and scutellum. Each male style, fig. 165C, gradually narrowed on apical sixth on ventral margin to a pointed apex. Aedeagus, fig. 165A, with a pair of lateral processes arising just before apex and extending laterally and then curved basally; processes about one-sixth the length of the ventral body of the aedeagus.

This species is known only from Illinois, Wisconsin, and Tennessee.

**Illinois Records.**—MACOMB: in pasture, July 3, 1934, DeLong & Ross, 1 ♂, 1 ♀ paratype. SAVANNA: July 19, 1892, Hart, Shiga, Forbes, & McElfresh, 1 ♂ paratype; July 27, 1892, Hart, Shiga, Forbes, & McElfresh, 1 ♂ paratype.

#### 6. *Gyponana orientala* DeLong

*Gyponana orientala* DeLong (1942, p. 26).

Length 10 mm. Resembling *octolineata* in color and general appearance, but male with distinctive genital structures. Vertex rather short and broad, almost twice as wide as long. Pale yellow, faintly marked with longitudinal orange bands on vertex, pronotum, and scutellum. Each male style, fig. 166C, with apical sixth gradually narrowed on ventral margin to a bluntly pointed apex. Aedeagus, fig. 166, with a pair of short lateral processes that arise just before apex, extend laterally and then curve basally.

This species has been collected in a few localities in the eastern United States and in Texas.

**Illinois Records.**—GALENA: July 10, 1934, DeLong & Ross, 1 ♂. MONTICELLO: June 11, 1934, Frison & DeLong, 3 ♂. WHITE HEATH: July 5, 1916, 2 ♂.

#### 7. *Gyponana flavilineata* (Fitch)

*Gypona flavilineata* Fitch (1851, p. 57).

Length 9.5–11.0 mm. Resembling *octolineata* in form and appearance. Vertex narrow, rather strongly produced and rounded, two-thirds as long as wide. Yellow; vertex, pronotum, and scutellum marked with orange-yellow longitudinal bands. Each male style, fig. 168C, with the apical third representing a foot with the bottom flat; heel abruptly bent on the ventral side, the dorsal margin curved and narrowed to the apex, which is curved to

outer margin. Aedeagus, fig. 168, narrowed to apex, where a pair of lateral curved processes extend laterally and then basally for more than one-fourth the distance to base.

This species ranges from Florida to Maryland and west to Utah and Texas.

**Illinois Records.**—Many males and females, taken June 5 to October 10, are from Albion, Apple River Canyon State Park, Beardstown, Byron, Cairo, Champaign, Danville, Eichorn, Geff, Gulfport, Havana, Harrisburg, Herod, Homan, Kampsville, Kankakee, Le Roy, Lima, Moweaqua, Monticello, Mount Carmel, Moweaqua, Norris City, Olive Branch, Omaha, Shawneetown, Siegel, Springfield, Urbana, Vandalia, Vienna, and White Pines Forest State Park.

#### 8. *Gyponana conspira* DeLong

*Gyponana conspira* DeLong (1942, p. 31).

Length 9.5–11.0 mm. Resembling *flavilineata* in general form and appearance, but with distinctive genitalia. Vertex roundedly produced, almost two-thirds as long at middle as basal width between the eyes. Pale yellowish; vertex, pronotum, and scutellum marked with longitudinal orange bands. Elytra yellowish subhyaline. Each male style, fig. 171C, slightly bent to form apical fourth, which is slightly widened on inner margin and then tapered to a bluntly rounded apex. Aedeagus, fig. 171, long, slender, with a pair of short lateral processes arising just before apex and extending basally one-fourth the length of the body of the aedeagus.

This species was described from Maine, Maryland, New York, and Illinois.

**Illinois Record.**—URBANA: June 30, 1891, Mitchell, 1 ♂.

#### 9. *Gyponana panda* DeLong

*Gyponana panda* DeLong (1942, p. 32).

Length 9.5–10.0 mm. Resembling *flavilineata* in form and general appearance, but male with distinctive genitalia. Vertex narrow, strongly produced, rounded at apex, two-thirds as long as wide. Pale, marked with orange longitudinal bands on vertex, pronotum, and scutellum. Each male style, fig. 169C, with apical fifth bent abruptly dorsad, outer margin concavely curved to



form an almost parallel-margined narrow finger-like process, which is curved caudad and is bluntly rounded at apex. Aedeagus, fig. 169, rather short and broad, with a pair of short appressed lateral processes arising just before apex and extending basally about one-third the length of the body of the aedeagus.

A widely distributed species in the Middle West and South, *panda* is also found in Oregon.

**Illinois Records.**—Many males and females, taken June 12 to November 15, are from Alton, Cobden, Dolson, Grand Tower, Havana, Homer, Kirkwood, Normal, Norris City, Oakwood, Oregon, Pike, Princeton, Quincy, Ripley, Savanna, Shawneetown, Sherman, Temple Hill, Urbana, and Watson.

#### 10. *Gyponana tenella* (Spangberg)

*Gypona tenella* Spangberg (1878b, p. 34).

Length 7–8 mm. Small, with a broadly rounded vertex. Vertex short, twice as wide as median length. General color pale green; vertex, pronotum, and scutellum marked with orange longitudinal bands. Veins of elytra inconspicuous. Each male style, fig. 170, narrowed on apical third, then curved dorsally with a pointed tooth on ventral margin about one-fourth the distance from the apex; gradually narrowed from this tooth to form a rather long narrow process, which is blunt and rounded at apex. Aedeagus rather narrow, with a pair of lateral processes arising just before apex; processes curved laterally and extended basally almost to base of ventral body of aedeagus.

This species has been previously recorded from the southeastern states only.

**Illinois Record.**—GRAND TOWER: July 12, 1909, 1 ♂.

#### 11. *Gyponana amara* DeLong

*Gyponana amara* DeLong (1942, p. 32).

Length 9.0–9.5 mm. Resembling *octolinata* in general appearance but with more produced vertex and with distinctive male genitalia. Vertex strongly and rather angularly produced, with apex rounded; more than half as long at middle as basal width between eyes. Pale yellow, conspicuously marked with bright orange longitudinal stripes on vertex, pronotum, and scutellum.

Elytra pale with darker veins. Each male style, fig. 167, with outer margin curved slightly outwardly on apical portion, tip curved caudally, angularly widened on inner margin about one-sixth the distance from apex and then tapered to upturned blunt tip. Aedeagus narrowed toward apex, with a pair of rather short lateral processes arising just before apex and extending basally about one-third the length of body of aedeagus.

This species was described from Illinois, Missouri, and Ohio.

**Illinois Records.**—ANTIOCH: Aug. 24, 1935, DeLong & Ross, 2 ♂, 2 ♀ paratypes. ATLAS: July 28, 1936, Mohr & Burks, 1 ♀ paratype. CHICAGO: Aug. 21–24, 1901, Titus, 1 ♂. HEROD: June 24, 1936, DeLong & Ross, 1 ♀ paratype. MUNCIE: cattail bog, Sept. 10, 1936, Burks, 1 ♂ paratype. SHAWNEETOWN: June 27, 1936, DeLong & Mohr, 3 ♂, 9 ♀ paratypes. SPRINGFIELD: July 2, 1885, 1 ♂. URBANA: Oct. 11, 1938, Riegel, 1 ♂ paratype.

#### 12. *Gyponana tubera* DeLong

*Gyponana tubera* DeLong (1942, p. 33).

Length 9.5–10.5 mm. Resembling *flavilincata* in form and general appearance but with distinctive genitalia. Vertex roundedly produced, less than two-thirds as long at middle as width between the eyes. Pale yellow, marked with faint orange longitudinal bands on vertex, pronotum, and scutellum. Each male style, fig. 172, bent dorsally and caudad, and narrowed at one-fifth the distance from apex, gradually narrowed to rounded blunt apex. Aedeagus with a pair of lateral processes arising just before bluntly pointed apex, curved laterally and basally about one-third the distance to base; aedeagus body is constricted just basad to point of origin of the apical lateral processes.

This species is found in the eastern United States and is distributed west to Tennessee and South Dakota. In Illinois it is known from only the southern half.

**Illinois Records.**—DANVILLE: July 30, 1917, 1 ♂ paratype. HEROD: Aug. 4, 1934, DeLong & Mohr, 1 ♀; July 8–11, 1935, DeLong & Ross, 1 ♂; June 20, 1938, DeLong & Ross, 1 ♀. MAKANDA: Aug. 20, 1891, French, 1 ♂. ROSICLARE: July 5, 1935, Frison & Mohr, 1 ♂.

13. *Gyponana turbina* DeLong

*Gyponana turbina* DeLong (1942, p. 37).

Length 9.5–11.0 mm. Resembling *flavilineata* in form and appearance but with distinctive male genitalia. Vertex broadly rounded, produced at middle, almost twice as wide as long. Green, vertex mottled with orange yellow. Each male style, fig. 173, curved slightly dorsad, with a broad short tooth on ventral margin about one-sixth the distance from the apex, the style gradually narrowed from this tooth to a pointed apex. Aedeagus narrowed apically, with a pair of lateral processes arising just before apex; processes curving basally and extending along body of aedeagus one-third the distance to the base.

This species is widely distributed from the East Coast west to Texas and Utah.

**Illinois Records.**—Males and females, taken May 23 to September 20, are from Champaign, Cornfield, Dixon Springs, Fulton, Herod, Meredosia, Muncie, Sugar Grove, Urbana, Volo, and White Pines Forest State Park.

14. *Gyponana expanda* DeLong

*Gyponana expanda* DeLong (1942, p. 38).

Length 10.5 mm. Resembling *octolineata* in form and appearance but with head more produced and with distinctive male genitalia. Vertex produced and rather broadly rounded, almost two-thirds as long as basal width between the eyes; margin thin and slightly curved upwards. Pale, almost white, with orange longitudinal bands on vertex, pronotum, and scutellum. Elytra with green veins. Each male style, fig. 154, curved dorsally on apical sixth, where a short pointed tooth arises on ventral margin; beyond this the apical portion is gradually tapered to a bluntly pointed apex. Aedeagus constricted at middle, decidedly enlarged and broadly rounded at apex; a pair of lateral processes arising at apex, curving laterally, and then extending basally about one-third the distance to the base of aedeagus body.

This species is known only from Illinois, Missouri, and Ohio.

**Illinois Records.**—DIXON SPRINGS: June 24, 1936, DeLong & Ross, 1 ♂, 5 ♀ paratypes. HOMER PARK: July 19, 1924, Frison, 2 ♂ paratypes; at light, July 11, 1927, Frison & Glasgow, 1 ♀ paratype.

15. *Gyponana extenda* DeLong

*Gyponana extenda* DeLong (1942, p. 39).

Length 10–12 mm. Resembling *flavilineata* in form and general appearance but with distinctive male genitalia. Vertex strongly produced, apex rounded, almost three-fourths as long as wide. Pale yellow, marked with faint longitudinal orange bands on vertex, pronotum, and scutellum. Each male style, fig. 155, strongly curved dorsally on apical third, and bearing a short tooth on the ventral margin about one-sixth the distance from apex; beyond tooth, style narrow and almost parallel margined to blunt apex. Aedeagus constricted near middle and enlarged at apex; a pair of lateral processes arising a short distance before produced rounded apex, extending laterally, and then curving basally to a point about one-third the distance to the base.

This species is widely distributed over the eastern United States.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, DeLong & Ross, 1 ♂, 3 ♀ paratypes. DOLSON: Rocky Branch, July 18, 1934, DeLong & Ross, 1 ♂, 2 ♀ paratypes. LA GRANGE: Aug. 23, 1935, DeLong & Ross, 2 ♂, 1 ♀ paratypes. OAKWOOD: Aug. 17, 1934, DeLong & Ross, 1 ♂ paratype. THEBES: July 29, 1909, 1 ♂ paratype; on cane, July 11, 1935, DeLong & Ross, 1 ♂ paratype.

16. *Gyponana protenta* DeLong

*Gyponana protenta* DeLong (1942, p. 41).

Length 9.5 mm. In general appearance resembling *acia* DeLong, but with vertex more strongly produced and with style long and narrow. Vertex roundedly produced, more than half as long at middle as basal width between eyes. Pronotum a little longer than vertex. Yellowish, vertex and pronotum with longitudinal orange bands. Elytra subhyaline, tinged with orange. Each style, fig. 156, with apical half gradually tapered to narrow rounded apex; outer margin angled one-fifth the distance from apex and bent upward; apical fifth narrow and fingerlike. Aedeagus with a pair of lateral terminal processes that extend laterally for a short distance, then curve and extend basally almost half the distance to base; they are tapered to fine pointed tips.

This species is known from Illinois and Ohio only.

**Illinois Records.**—GRAFTON: along river, June 26, 1934, DeLong & Ross, 1 ♂, 2 ♀. JUSTICE: July 23, 1937, Mohr & Burks, 1 ♂ paratype. MARSHALL: Sept. 27, 1934, 3 ♀. URBANA: June 21, 1936, Burks, 1 ♀ paratype; June 24–25, 1936, Riegel, 2 ♂ paratypes; Sept. 8, 1938, Riegel, 1 ♂ paratype; Sept. 10, 1938, Riegel 1 ♂ paratype; Sept. 14, 1938, Riegel, 1 ♂ paratype. WHITE PINES FOREST STATE PARK: Aug. 13–14, 1937, Ross & Burks, 1 ♂ paratype.

### 17. *Gyponana scrupulosa* (Spangberg)

*Gypona scrupulosa* Spangberg (1878b, p. 9).

Length 9.0–9.75 mm. Yellowish, closely related to *octolineata*. Vertex rather short and broadly rounded, almost twice as wide as long, without definite markings. Each male style, fig. 157, with apical third rather broad to ventral tooth on basal portion; beyond this the apical one-sixth of style is narrow, produced dorsally, and curved anteriorly to a bluntly pointed apex. Aedeagus with a pair of short lateral processes arising just before apex and recurved inwardly.

This is a widely distributed and common eastern species ranging west to Wisconsin and Texas.

**Illinois Records.**—Males and females, taken June 20 to October 3, are from Algonquin, Alto Pass, Anna, Anvil Rock, Bluffs, Borton, Cave in Rock, Champaign, Clay City, Dubois, Du Quoin, East St. Louis, Elizabeth, Elizabethtown, Mason City, Metropolis, Normal, Pulaski, Putnam, Urbana, Warren, and Waukegan.

### 18. *Gyponana octolineata* (Say)

*Tettigonia octolineata* Say (1825, p. 340).

*Gypona geminata* Osborn (1905b, p. 513).

Length 9–10 mm. Greenish to pale yellow, with eight reddish longitudinal lines on vertex and pronotum. Vertex produced and broadly rounded, about two-thirds as long at middle as basal width between eyes. Each male style, fig. 159, with apical one-sixth gradually narrowed from ventral tooth to a blunt apex; the caudal margin is straight and the apical portion does not curve anteriorly. Aedeagus with a pair of short lateral processes that arise just before apex and extend laterally, their apices recurved.

This species occurs in the eastern United States.

**Illinois Records.**—PHILLIPSTOWN: June 24, 1936, DeLong & Ross, 2 ♂. URBANA: June 21, 1936, B. D. Burks, 1 ♂; light trap, Sept. 5–9, 1938, G. T. Riegel, 3 ♂, 2 ♀.

### 19. *Gyponana octolineata* var. *serpenta* DeLong

*Gyponana octolineata* var. *serpenta* DeLong (1942, p. 53).

Length 9–11 mm. Similar to *octolineata* in form and appearance but each style with a slightly curved apical portion. Vertex strongly produced, broadly rounded, a little more than half as long at middle as basal width between eyes. Pale yellow, vertex, pronotum, and scutellum marked with longitudinal orange bands. Each male style, fig. 160, with apical sixth gradually constricted to blunt apex and slightly curved anteriorly. Aedeagus rather broad, with a pair of short lateral processes that are curved strongly on apical portions.

A widely distributed and common variety in the eastern states, *serpenta* ranges west to Wyoming.

**Illinois Records.**—Males and females, taken June 11 to October 13, are from Alto Pass, Anna, Carbondale, Cave in Rock, Dongola, Dubois, Gibsonia, Kampsville, Long Lake, Oquawka, St. Anne, Sparta, Springfield, Urbana, Volo, Waukegan, and Woodworth.

### 20. *Gyponana angula* DeLong

*Gyponana angula* DeLong (1942, p. 54).

Length 9–10 mm. Resembling *octolineata* in form and general appearance, male genitalia distinctive. Vertex roundedly produced, about two-thirds as long as wide. Yellowish, mottled with orange on vertex, pronotum, and scutellum, longitudinal bands usually distinct. Elytra often tinged with orange, veins pale green. Each male style, fig. 158, with apical sixth narrowed beyond ventral pointed tooth to form a narrow constricted portion just before a slightly enlarged rounded blunt apex. Aedeagus with a pair of short basally directed and apically curved processes.

This species is found in the eastern states and west as far as Texas. It is very rare in Illinois.

**Illinois Records.**—METROPOLIS: Aug. 19, 1916, 1 ♂ paratype. OMAHA: June 23, 1936, DeLong & Ross, 2 ♂.

26. *RUGOSANA* DeLong

*Rugosana* DeLong (1942, p. 64).

Related to and similar to *Gyponana* but with elytra rugose or roughened. Usually the vertex and pronotum are rugose also. The members of this genus may be distinguished from those of genera having a strong venation, in which the veins appear embossed. The rugose character in this genus is not caused by the condition of the veins, but by the venation of irregular reticulation which may tend to cause it to be more conspicuous. The vertex is flattened, depressed, and is strongly foliaceous. The pronotum bears a large round black spot about the middle behind each eye. The elytra are often so colored as to appear with many crossveins; apical portion has numerous crossveins.

This is a small genus of nine species, which are found chiefly in the Southwest, but the genus contains one widespread species that has been taken in Illinois.

1. *Rugosana querci* DeLong

*Rugosana querci* DeLong (1942, p. 69).

Fig. 153. Length 9–10 mm. Resembling *rugosa* (Spangberg) (1878*b*, p. 6), but with distinctive genitalia. Vertex produced and rather broadly rounded, almost twice as wide as long. Pale yellow, with traces of longitudinal orange bands on vertex, pronotum, and scutellum. Pronotum with a conspicuous round black spot on each side of outer margin of disc. Elytra pale, mottled with brownish yellow, causing a rugose appearance.

Female seventh sternite, fig. 153, almost truncate on posterior margin, median third abruptly excavated one-half the distance to the base, the excavation bearing a broad blunt rounded tooth slightly notched at middle and produced about one-third the depth of the excavation. Each male style, fig. 153, with basal third narrow and constricted at two-thirds its length, thus forming two convexly rounded ventral lobes, the apical one of which is serrate and extends to the broad bluntly rounded apex. Aedeagus, fig. 153, with an abruptly narrowed, prolonged, finger-like apical process at the base of which on either side arises a long slender process; each process crosses the one from the opposite side and extends apically the length of the body of the aedeagus.

A widely distributed eastern species, *querci* occurs as far west as Utah and Arizona. It is a common species on oak in the eastern and southern states.

**Illinois Records:**—ALCONQUIN: Aug. 25, 1897, 1 ♀ paratype. ASHLEY: Aug. 7, 1871, 1 ♀ paratype. DOLSON: Rocky Branch, July 18, 1934, DeLong & Ross; 1 ♀ paratype. DUBOIS: Aug. 8, 1917, 2 ♂, 5 ♀ paratypes. HAVANA: Aug. 20, 1917, 1 ♀ paratype. MEREDOSIA: Aug. 19, 1917, 5 ♂, 11 ♀ paratypes. SAVANNA: July 27, 1892, McElfresh, Shiga, Forbes, & Hart, 1 ♀ paratype.

27. *PRAIRIANA* Ball

*Prairiana* Ball (1920, p. 90).

Related to and similar to *Rugosana*, but with eyes small and widely separated. Usually decidedly flattened and some shade of brown or black. Pronotum broad, flat, lateral margins almost straight. Vertex about as wide as pronotum, often elongate, and with thin foliaceous anterior margin. Elytra often shorter than abdomen. Ocelli on disc usually a little nearer median line than eyes.

Fifteen species and several varieties have been recorded for the United States. Two species and one variety are known to occur in Illinois.

## KEY TO SPECIES

Length more than 8 mm.; vertex broadly and angularly produced, apex rounded, more than two-thirds as long at middle as basal width between eyes. . . . . 2. *kansana*  
Length about 7 mm.; vertex more broadly rounded, slightly more than half as long as wide. . . . . 1. *cinerea*

1. *Prairiana cinerea* (Uhler)

*Gypona cinerea* Uhler (1877, p. 460).

Length 7–9 mm. Small, with a broadly rounded head. Vertex broadly rounded and produced, about one-third wider than long. Pale brown, with dark brown punctures. Vertex with a black spot each side on base of vertex half way between eye and median line. A spot on anterior portion of pronotum behind each spot on vertex. Veins of elytra margined with dark brown punctures and with scattered brownish spots. Female seventh sternite concavely rounded on posterior margin either side of a slightly produced median rounded lobe. Each male style gradually tapered on apical half to a

rather blunt slightly broadened apex. Aedeagus with dorsal portion deeply and concavely excavated on dorsal surface just before apex, which is produced to form long, dorsally curved, pointed processes; ventral portion curved back upon itself so that the apex is in the concavity of the dorsal portion.

This is a widespread middle western species found as far west as Colorado and Montana.

**Illinois Record.**—CHICAGO: (Glenview), June 5, 1912, 1 ♂.

2. *Prairiana kansana* Ball

*Prairiana cinerea* var. *kansana* Ball (1920, p. 91).

Length 9 mm. Broad, with a broad almost angularly produced vertex. Vertex about two-thirds as long at middle as basal width between eyes. Pale brown, vertex and pronotum heavily marked with brownish punctures. Veins of elytra faintly marked with brown. Female seventh sternite with produced lateral angles, between which the posterior margin is concavely excavated on either side of a median lobe; lobe rounded, produced, and slightly notched at apex. Male style similar to that of *cinerea*, concavely rounded, narrowed just before blunt apex, which is slightly enlarged. Aedeagus shallowly and concavely excavated just before dorsally curved sharply pointed apex, which extends dorsad.

This species, and its variety *angustens*, have been taken in the Middle West only.

**Illinois Record.**—HANOVER: sand prairie, July 10, 1934, DeLong & Ross, 1 ♂.

*Prairiana kansana* var. *angustens* DeLong

*Prairiana kansana* var. *angustens* DeLong (1942, p. 83).

Length 10.5 mm. Resembling *kansana* in general appearance, but more slender, elongate, and with vertex more pointed. Vertex about one-third wider between eyes than median length. Pale brown, tinged with white. Vertex and pronotum punctate with small brown spots. Elytra pale, faintly margined with brown. The male aedeagus and styles are similar to those of *kansana*.

**Illinois Records.**—EVERGREEN PARK: July 1, 1935, 1 specimen. URBANA: July 21, 1936, B. D. Burks, 4 ♂; July 25, 1934, Frison & DeLong, 1 ♂.

28. *PONANA* Ball

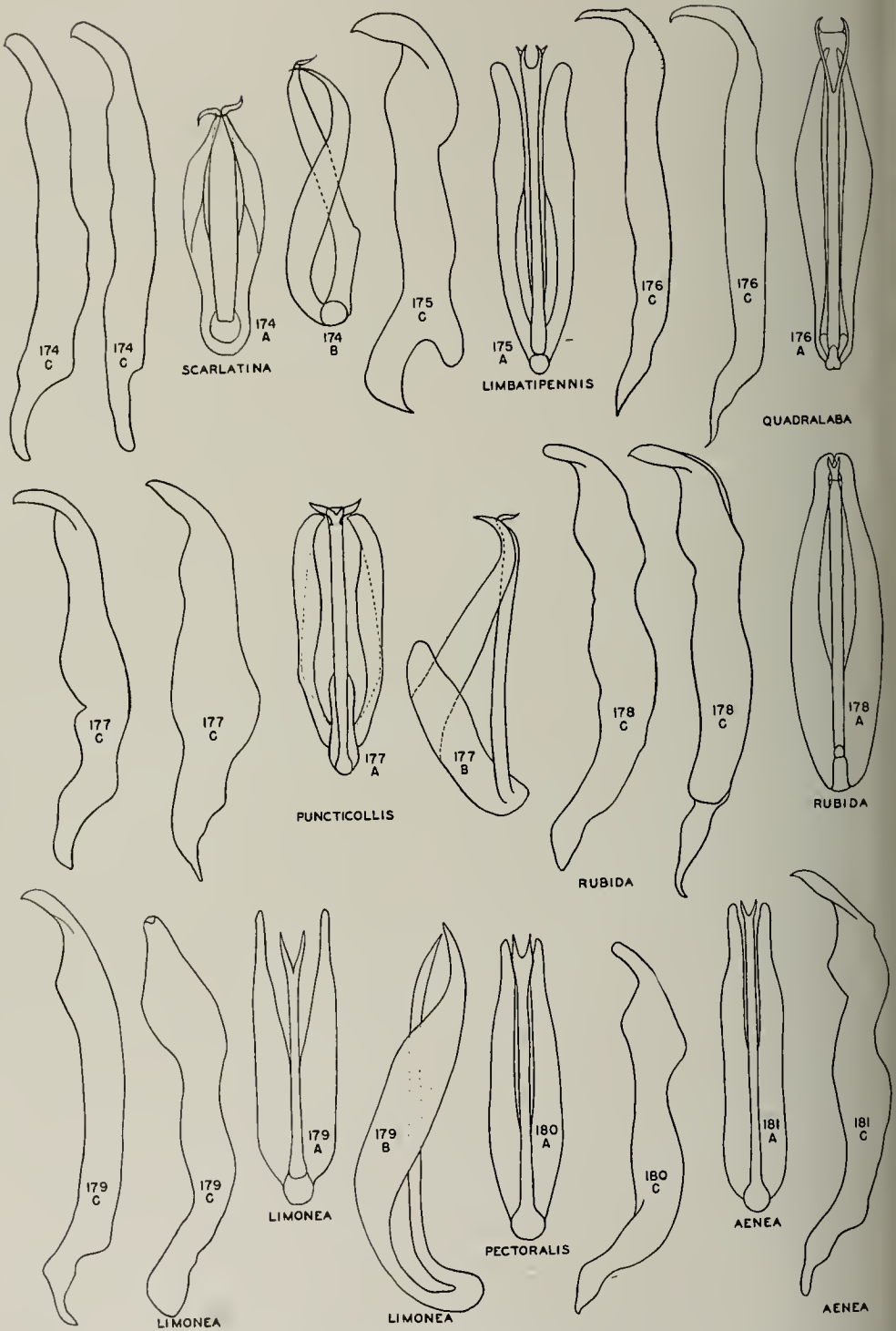
*Ponana* Ball (1920, p. 93).

Fig. 22. Related to and similar to *Gypsona*, but with body more convex and cylindrical in type. Pronotum conspicuously wider than vertex, transverse, striated, convexly sloping to vertex; lateral margins almost angled, laterally produced. Vertex usually convex or sloping, with a rather definite depression just before the thickened anterior margin, depression also indicated below margin; vertex and front meeting at nearly a right angle, front scarcely inflated. Ocelli rather large, on disc before middle.

The genus contains 22 species in the Nearctic region distributed over the eastern United States and the Southwest. Four of these species have been taken in Illinois, while several others may occur here.

KEY TO SPECIES

1. Vertex and often pronotum marked with small reddish dots ..... 2  
Vertex and pronotum without reddish dots ..... 3
2. Vertex produced at middle; pronotum with two black spots on anterior margin, one behind each ocellus **1. scarlatina**  
Vertex more broadly rounded; pronotum with four black spots on anterior margin, one behind each ocellus and one behind each eye ..... **2. puncticollis**
3. Pronotum and elytra heavily punctate with small brown spots ..... **2. puncticollis**  
Pronotum and elytra not marked with small brown spots ..... 4
4. Elytra uniformly dark brown to black, costae conspicuously yellow; vertex and pronotum pale, unmarked ..... **5. limbatipennis**  
Elytra not uniformly dark in color ..... 5
5. Anterior portion of pronotum with four conspicuous spots ..... **7. quadralaba**  
Pronotum without definite dark markings on anterior portion ..... 6
6. Dull yellowish green, scutellum and claval area smoky to dark brown ..... 7  
Claval area not smoky or brown, elytra usually with spots or crossveins pigmented ..... 8
7. Elytra smoky along commissural line; male styles, fig. 179C, shallowly excavated on inner margins; central portion of aedeagus, fig. 179A, more deeply and angularly excavated at apex ..... **8. limonea**  
Elytra heavily and broadly marked with brown along commissure; male styles, fig. 180C, more deeply and roundedly excavated on inner margins; apex of central portion of aedeagus, fig. 180A, rather deeply and roundedly excavated ..... **6. pectoralis**



Figs. 174-181.—*Ponana*, male genitalia. A, ventral aspect of aedeagus; B, lateral aspect of aedeagus; C, style, two views.

8. Male styles, fig. 178C, shallowly and roundedly notched on outer margins; central portion of aedeagus, fig. 178J, straight and bifurcate at apex; elytra with dark brown pigment markings, resembling crossveins, especially on clavus just posterior to scutellum . . . . . 4. *rubida*  
 Male styles, fig. 181C, deeply and angularly notched on outer margins; central portion of aedeagus, fig. 181J, constricted just before bifurcate apical portion; elytra pale to dark brown . . . . . 3. *aenea*

### 1. *Ponana scarlatina* (Fitch)

*Gypona scarlatina* Fitch (1851, p. 57).  
*Gypona irrorella* Spangberg (1878b, p. 60).  
*Gypona spadix* DeLong (1918b, p. 235).  
*Gypona rodora* Ball (1920, p. 96).

Length 8.5-9.0 mm. Yellowish brown, completely dotted with bright red in well-marked specimens. Head narrow, vertex broadly rounded, almost twice as wide as long. Varying from buff to brown, and usually marked with red spots on all portions of dorsal surface. Veins frequently red. The degree and intensity of coloration is quite variable.

Female seventh sternite with well-produced rounded lateral angles, between which the posterior margin is concavely excavated either side of a broad median produced lobe, which is slightly notched at middle. Each male style, fig. 174, with apical portion narrowed but almost parallel margined to apex, which is rather broad and rounded and with a short point on inner apex. Aedeagus in ventral view, fig. 174, with a pair of forceps-like structures and a median elongated portion, which bears a pair of small curved lateral processes at the apex.

A widely distributed eastern species, *scarlatina* ranges west to Kansas and Texas.

Illinois Records.—OLIVE BRANCH: Horseshoe Lake, Aug. 2, 1934, DeLong & Mohr, 1 ♂. VIENNA: July 29, 1934, DeLong & Ross, 1 ♀.

### 2. *Ponana puncticollis* (Spangberg)

*Gypona puncticollis* Spangberg (1878b, p. 54).  
*Gypona sanguinolenta* Spangberg (1878b, p. 63).  
*Gypona grisea* Spangberg (1878b, p. 64).  
*Gypona proscripta* Fowler (1903, p. 309).

Length 9 mm. Pale brownish, with four large round spots just behind anterior margin of pronotum and with elytra heavily marked with brownish irrorations. Vertex

rather strongly produced and rounded, more than half as long at middle as basal width between the eyes. Vertex and pronotum often with fine brown or reddish punctures. Elytra generally marked with small round brownish spots; in addition there are heavy brownish areas arranged in two broken transverse bands across each clavus. The intensity of these bands varies.

Female seventh sternite with produced rounded lateral angles, between which the posterior margin is concavely excavated either side of a broad median lobe, which is produced beyond the lateral angles and slightly notched at middle. Each male style, fig. 177, broad, narrowed toward apex, and constricted to form a thick finger-like curved tip, which is bluntly pointed at apex. Aedeagus appearing in ventral view with the paired lateral processes blunt at apexes and rounded; median process long and slender, with broadened apex from which arise two lateral processes that are rigidly fastened together and form a semicircular band with sharp-pointed apexes curved ventrally.

This species has been recorded from Florida.

### 3. *Ponana aenea* DeLong

*Ponana aenea* DeLong (1942, p. 94).

Length 8 mm. Resembling *scarlatina* in general appearance, but with more markedly produced vertex and with distinctive male genitalia. Vertex rather strongly produced, apex rounded, more than half as long at middle as basal width between eyes. Yellow, tinged with brown. Elytra pale to dark brownish (sometimes with reddish flecks as in *scarlatina*).

Female seventh sternite with lateral angles produced and rounded, between which the posterior margin is concavely excavated either side of a pair of short broadly rounded median lobes separated by a short median notch. Each male style, fig. 181, broad, rather deeply and concavely notched on ventral margin at about the middle, angularly notched on dorsal margin a little farther apically, then decidedly narrowed and produced, forming a thick finger-like process directed outwardly and pointed at apex. Aedeagus as viewed ventrally with the paired lateral processes tapered at apexes; median slender portion bifid at apex, with very short apical processes.

The style and aedeagus are both excellent characters to separate this species from *scarlatina*.

This species has not been taken in Illinois, but is known to occur in Kansas and Missouri and east to Pennsylvania and Maryland.

#### 4. *Ponana rubida* DeLong

*Ponana rubida* DeLong (1942, p. 95).

Length 9.0–9.5 mm. Resembling *scarlatina* in general appearance, but with brown ramose markings on elytra and with distinctive male genitalia. Vertex broadly rounded, a little more than half as long at middle as basal width between eyes. Dark brown pigment markings of elytra resembling crossveins; these more abundant on claval areas just back of apex of scutellum. Female seventh sternite roundedly produced, shallowly and broadly notched at apex, slightly sinuate on either side about half way between lateral angles and apex. Each male style, fig. 178, even broader than in *aenea*, not so deeply notched on either ventral or dorsal edges and with apex shorter, thicker, and more blunt at apex than in that species. Aedeagus with the median process narrow, constricted on dorsal side, then bifurcate and broadened; ventral portion forming a sheath that is not constricted.

This is chiefly a middle western species, but has been taken as far east as Pennsylvania.

**Illinois Records.**—Males and females, taken June 2 to August 23, are from Apple River Canyon State Park, Dolson, Fox Lake, Havana, La Grange, northern Illinois, Oakwood, Savanna, Urbana, and Vienna.

#### 5. *Ponana limbatipennis* (Spangberg)

*Gypona limbatipennis* Spangberg (1878b, p. 47).

Length 8.75–9.5 mm. Dark, with pale costal margins. Vertex broadly rounded, more than half as long as basal width between eyes. Color brownish yellow, vertex and pronotum usually unmarked, scutellum smoky, elytra usually smoky to black, apical half of each often paler with dark veins, costa with broad yellowish margin. Female seventh sternite with posterior margin slightly sinuate; broadly and shallowly notched at middle. Each male style, fig. 175,

rather slender, rather shallowly notched on ventral and dorsal margins, abruptly narrowed just before apex, the apical tip rather slender; finger-like apex curved to a point on inner margin. Aedeagus with the paired lateral portions narrowed just before apex, with apices blunt, divergent; median process slender, slightly enlarged at apex, median portion excavated, with a slight median tooth at base; each arm forming the excavation bifid at apex, the outer tooth shorter than the inner tooth. The characters of the aedeagus will easily separate this from all allied species.

This is a middle western species recorded from Ohio, Illinois, and Iowa.

**Illinois Records.**—ALGONQUIN: July 8, 1897, 1 ♀. APPLE RIVER CANYON STATE PARK: July 11, 1934, Ross & DeLong, 1 ♂, 1 ♀. MARSHALL: June 14, 1933, Frison & Ross, 1 ♂. OAKWOOD: June 14, 1935, Mohr, 1 ♂. STARRS ROCK STATE PARK: June 28, 1937, Ross & Burks, 1 ♂. STRATFORD: June 22, 1917, 1 ♂. URBANA: June 17, 1889, Hart, 1 ♂.

#### 6. *Ponana pectoralis* (Spangberg)

*Gypona pectoralis* Spangberg (1878b, p. 46). *Gypona albimarginata* Woodworth (1887, p. 31).

*Gypona bimaculata* Woodworth (1887, p. 32). *Gypona woodworthi* Van Duzee (1915b, p. 59).

Length 10 mm. Yellowish brown, with dark coloration on the corium and clavus of each elytron. Vertex broadly produced, more than half as long as basal width between the eyes. Disc of pronotum darker than elytra; scutellum darker on anterior half; elytra yellowish, subhyaline claval area more smoky and with brownish spots on each corium and clavus.

Female seventh sternite with posterior margin broadly and rather shallowly notched at middle, with a rounded lobe either side, the lobe usually slightly sinuate at middle. Each male style, fig. 180, broad, deeply and concavely notched on inner margin, then enlarged and sloped to a rather thick finger-like apex, which is formed by a deep angular notch on inner margin. Aedeagus with apices of lateral paired portions blunt and divergent, median portion slender, enlarged at apex, rather deeply notched, forming a pair of divergent pointed tips.

This species is distributed from the Dis-



trict of Columbia west to Kansas and Texas.

**Illinois Records.**—Many males and females, collected May 26 to August 22, are from Antioch, Dolson, Fox Lake, Galena, Grand Tower, Homan, Kampsville, Kankakee, La Grange, Mount Carmel, Oak Lawn, Oquawka, Pulaski, Savanna, Thebes, Vienna, Urbana, and White Heath.

### 7. *Ponana quadralaba* DeLong

*Ponana quadralaba* DeLong (1942, p. 98).

Length 7.0–8.5 mm. Small, yellowish to brownish, with four black spots on anterior portion of pronotum. Vertex broadly rounded, more than half as long at middle as basal width between eyes. Each elytron with a few brown blotches on clavus and apex of clavus, and one on corium.

Female seventh sternite concavely rounded from lateral angles to the slightly produced median third, which is broadly and shallowly notched at middle, forming a part of the proximal rounded lobes. Each male style, fig. 176, rather narrow, sides scarcely sinuate to a point near apex, where it is concavely excavated on inner margin, with apex strongly curved dorsally and produced into a finger-like process; style usually with a slightly enlarged blunt tooth on outer margin of curved portion at base of the finger-like process. Aedeagus with the paired lateral portions enlarged at middle, tapered to blunt apices; median process long, rather slender, decidedly broadened at apex, appearing deeply and angularly excavated, and forming two long divergent slender pointed processes; between processes is a membranous wall extending to one-fourth the distance from the pointed apices.

This species is distributed from New Jersey to Arizona.

**Illinois Records.**—Males and females, taken June 18 to October 2, are from Alton, Bluffs, Carbondale, Dubois, Elizabethtown, Gibsonia, Grafton, Omaha, Savanna, Shawneetown, Starved Rock State Park, Urbana, and Warren.

### 8. *Ponana limonca* Ball & Reeves

*Ponana scarlatina* var. *limonca* Ball & Reeves (1927, p. 498).

Length 10 mm. Smoky greenish, with a well-produced vertex. Vertex more than

half as long at middle as width between eyes. Vertex and pronotum often brighter green than elytra. Female seventh sternite almost truncate, with a broad shallow median notch at middle. Each male style, fig. 179, rather broad, with a produced rounded lobe on dorsal margin not far from apex; margin concavely rounded from rounded lobe to form a narrow produced apical process, which is pointed at tip. Aedeagus with lateral paired portions tapered to bluntly pointed apices; median process long, slender, enlarged at apex, with a pair of long slender tapered pointed processes separated by a deep V-shaped excavation.

This species is known from Ohio only.

## Subfamily LEDRINAE

The members of this subfamily are easily recognized by a combination of characters. The forewings are deeply pitted, and the anterior part of the body is dorsoventrally flattened so as to appear wedge shaped. The elytra are laterally appressed at their apices, and together appear wedge shaped.

Lawson (1931a) records 13 species in the only genus, *Xerophloea*, belonging to this subfamily in the United States.

### 29. *XEROPHLOEA* Germar

*Xerophloea* Germar (1839, p. 190).

*Mesodicus* Fieber (1866, p. 501).

*Parapholis* Uhler (1877, p. 461).

Fig. 21. Head broad, vertex broadly angled or broadly rounded in front, flat, anterior margin thin. Elytra long, angularly pointed, perpendicular at apices. The entire dorsal surface, especially the pronotum and elytra, coarsely and rather densely pitted. The broad head and pronotum and the perpendicular character of elytra at the apices give to the insect a characteristic wedge-shaped appearance.

Four species of the genus are known to occur in the eastern United States. Two of these have been collected in Illinois.

#### KEY TO SPECIES

- Vertex distinctly angulate, slightly over half as long at middle as width between eyes at base. Length 6.0–7.5 mm. **1. viridis**  
 Vertex broadly rounded, at least two-thirds as long at middle as basal width between eyes. Length 7.5–8.0 mm. **2. major**

1. *Xerophloea viridis* (Fabricius)

*Cercopis viridis* Fabricius (1794, p. 50).  
*Xerophloea grisea* Germar (1839, p. 190).  
*Xerophloea virescens* Stål (1854, p. 253).  
*Parapholis peltata* Uhler (1877, p. 461).

Length 6.0-7.5 mm. Color green to brownish yellow. Head a little narrower than pronotum. Vertex convexly rounded on sides to a definitely angulate apex; little more than half as long at middle as basal width between eyes. Females usually light green, often marked with minute black dots, particularly along elytral veins. Males often appearing entirely brown, usually yellowish green, with the median line of vertex and posterior portion of pronotum brown.

A common species on upland meadows and prairies, *viridis* usually occurs on short grasses in association with *Aristida gracilis*. It is widely distributed throughout the United States.

Illinois Record.—OQUAWKA: on muskmelon, July 16, 1937, Mohr & Burks, 1 ♀.

2. *Xerophloea major* Baker

*Xerophloea major* Baker (1898c, p. 285).

Fig. 182. Length 7.5-8.0 mm. Large, stout, green, often well marked with numerous black dots. Head slightly narrower than pronotum. Vertex strongly and broadly rounded, two-thirds as long as width between eyes.

This species is unique in its large size and rounded vertex. It occurs in grasses

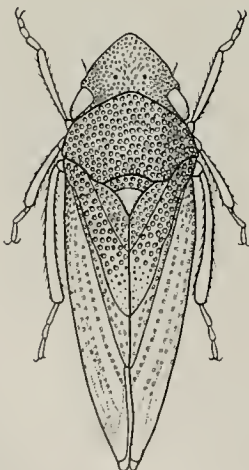


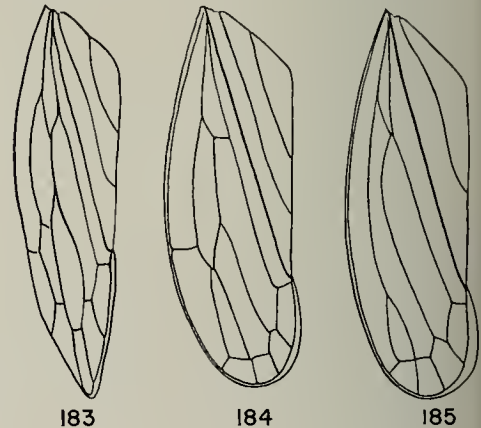
Fig. 182.—*Xerophloea major* ♀.

and is frequently found in the wet prairie. It ranges from the East Coast west to Tennessee and Kansas.

Illinois Records.—Males and females, taken June 27 to October 3, are from Albion, Alton, Anvil Rock, Barry, Cave in Rock, Kampsville, Oquawka, Port Byron, and Urbana.

Subfamily DORYDIINAE

All the genera of this group, especially in the female, have a produced flattened vertex with a sharp thin foliaceous margin. The ocelli are on the front margin and usu-



Elytra of Dorydiinae

- Fig. 183.—*Dorydiella kansana*.
- Fig. 184.—*Parabolocratas flavidus*.
- Fig. 185.—*Spangbergiella quadripunctata*.

ally very close to the eyes. The females of most of the genera have the elytra short, exposing the last one or more abdominal segments.

This subfamily is represented by seven genera in the eastern United States, and five of these occur in Illinois.

KEY TO GENERA

1. Elytra narrowed posteriorly to pointed tips, fig. 183; general color brownish... 35. *Dorydiella*  
 Elytra not narrowed posteriorly, apex well rounded ..... 2
2. Vertex with a broad deep longitudinal furrow, extending nearly to base of head, and a slight ridge on either side; pronotum with a sharp median carina, fig. 187..... 31. *Neoslossonia*  
 Vertex flat, or with a median carina..... 3
3. Vertex extremely long and foliaceous, more than twice as long as basal width

between eyes, and with a median longitudinal carina extending nearly its full length, fig. 189; color brownish

**30. Dorycephalus**

Vertex usually more thickened, flat without carina, and not more than twice as long as basal width between eyes; color usually greenish, sometimes marked with black, red, or orange

- 4. Elytra with one claval (anal) vein marked with red, fig. 185; head and pronotum with a pair of diagonal red or orange stripes

**33. Spangbergiella**

Elytra with two claval veins, or veins obscured; stripes, if present, longitudinal

- 5. Vertex decidedly longer than basa width between eyes

Vertex not more than width between eyes, fig. 186B; color usually uniformly pale green

**34. Parabolocratus**

- 6. Body above pale green, with a pair of reddish stripes extending from front margin of vertex to posterior margin of scutellum, fig. 190; at least veins in basal half of elytra marked with red, orange, or yellow

**32. Hecalus**

Body above straw colored, marked with brown; vertex with a broad, brown, irregular longitudinal band, fig. 188

**36. Dicyphonia**

**30. DORYCEPHALUS** Kuschakewitch

*Dorycephalus* Kuschakewitch (1866, p. 102).

Large, elongate, with extremely long produced flat head, which is thin and foliaceous on outer margin and at apex. Female with short elytra, exposing the last three to five dorsal segments of the abdomen; in the male the elytra usually extend to the apex of the abdomen.

The members of this genus are grass-feeding species and occur in prairie habitats. Eight species are known to occur in North America. Two of these have been collected in Illinois, and others may be found here.

KEY TO SPECIES

Head broad, front convex transversely; elytra more than half the length of abdomen in both sexes

**1. platyrhynchus**

Head narrow, front strongly concave for its entire length; elytra less than half the length of abdomen in both sexes

**2. vanduzei**

**1. *Dorycephalus platyrhynchus* Osborn**

*Dorycephalus platyrhynchus* Osborn (1894, p. 216).

Fig. 189. Length of male 9-10 mm., female 14-15 mm. Female yellowish to brown-

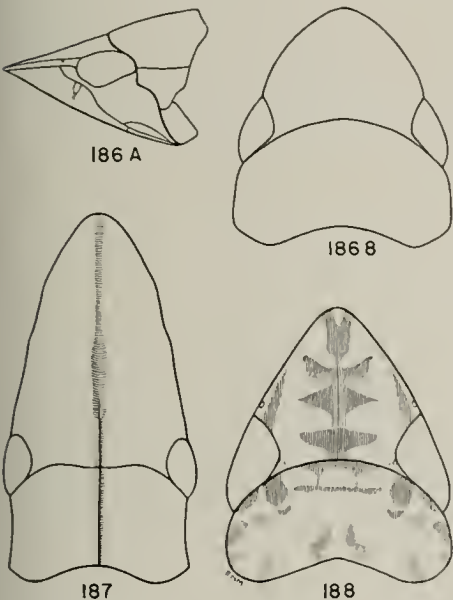


Fig. 186.—*Parabolocratus viridis*. A, lateral aspect; B, dorsal aspect of head and thorax.

Fig. 187.—*Neoslossonia putnami*, dorsal aspect of head and pronotum.

Fig. 188.—*Dicyphonia ornata*, dorsal aspect of head and pronotum.

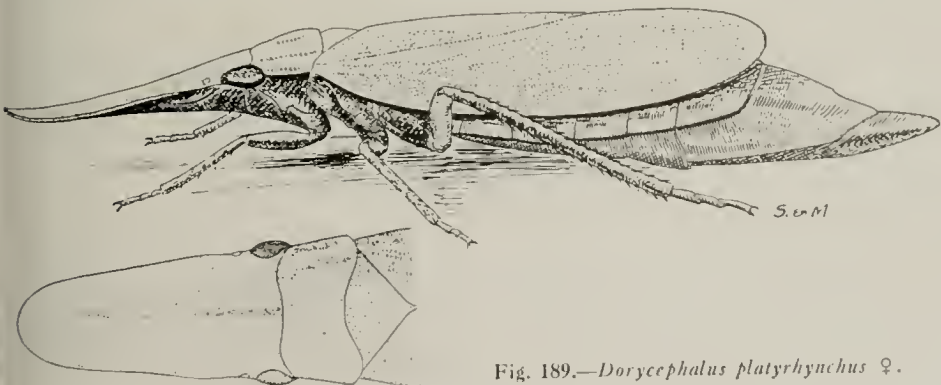


Fig. 189.—*Dorycephalus platyrhynchus* ♀.

ish, resembling a dried blade of grass; with a long foliaceous head having a median keel; vertex almost two and one-half times as long as basal width, broad to apex, which is broadly rounded. Elytra of female short, exposing the last three segments of the abdomen. Male usually brown, vertex about one and one-half times as long as basal width between eyes; elytra usually reaching tip of abdomen.

Female seventh sternite broadly and shallowly emarginate, almost truncate, with a short rounded median tooth. Male plates as long as combined basal width, concavely narrowed to blunt apexes. Valve short and broad. Pygofers twice as long as plates.

This is a typical prairie species occurring on grasses of the prairie association. Recorded from two species of *Elymus* in Iowa, it is known from the Middle West ranging from Illinois to Colorado.

**Illinois Records.**—DECATUR: June 12–29, 1935, Frison, Mohr, & DeLong, 21 ♂, 8 ♀. HILLSDALE: June 5, 1940, Mohr & Burks, 1 ♂. ROCKFORD: July 5, 1932, Dozier & Mohr, 1 ♂. SUMMIT: July 17, 1935, DeLong & Ross, 1 ♀.

## 2. *Dorycephalus vanduzeei* Osborn & Ball

*Dorycephalus vanduzeei* Osborn & Ball (1898, p. 74).

Length 13–14 mm. Extremely long, slender, with thin flat head. Yellowish to green, marked with black spots. Entire insect is about 10 times as long as broad. Vertex three times as long as pronotum, foliaceous, apex broad, rounded, slightly elevated; front broadly, concavely, longitudinally depressed. Elytra short, reaching only to base of third abdominal segment, apexes narrowed, rounded, and divergent. The abdominal segments each bear four small spots on the dorsal surface arrayed in two longitudinal rows. A lateral row each side is formed by a larger spot at the lateral line on each segment. Female seventh sternite long, almost truncate; male pygofers stylelike and very elongated.

This species occurs on the short grass, *Sporobolus cuspidatus*, and it has also been taken from the *Aristida purpurea* association. It has been previously recorded from Florida, Colorado, Kansas, and Nebraska.

**Illinois Record.**—OAK LAWN: July 11, 1945, DeLong & Ross, 1 ♂, 1 ♀.

## 31. *NEOSLOSSONIA* Van Duzee

*Neoslossonia* Van Duzee (1909a, p. 218).

Vertex obtusely triangular, almost flat, having a broad median longitudinal furrow, at either side of which is an elevated ridge. Pronotum with a median carina. Head as long as width at base; head and pronotum coarsely punctate.

Only one species of this genus, *putnami*, has been described, and it has been taken in Georgia and Florida. It has not been taken in Illinois, but in view of the peculiar occurrence of several typical Florida species in an area of the old Lake Michigan basin south and west of Chicago, it seems possible that it might at some time be found in that area of the state.

### 1. *Neoslossonia putnami* (Osborn)

*Dorycephalus putnami* Osborn (1907, p. 163).

Fig. 187. Length 5.5 mm. Broad, flat-headed, black, without color markings. Vertex almost flat, about as long at middle as basal width between eyes, with a broad median furrow. Vertex and pronotum coarsely punctate. Elytra reaching almost to tip of abdomen, minutely punctate. Male valve broad and short, triangular. Plates triangular, elongate, slender, acute at apexes, about half as long as pygofers.

This species has been found on marsh grasses.

## 32. *HECALUS* Stål

*Hecalus* Stål (1864, p. 65).

*Glossocratus* Fieber (1866, p. 502).

Vertex longer than basal width, flattened, sharp and foliaceous at margin. Pronotum very short and broad. Clavus of each elytron with at least two veins. Elytra shorter than abdomen.

The members of this genus inhabit marshes, where they feed upon coarse grasses and sedges. Four species are known for the United States, and one of them is found in Illinois.

### 1. *Hecalus lineatus* (Uhler)

*Glossocratus lineatus* Uhler (1877, p. 463).

Fig. 190. Length of female 9 mm., male 7 mm. Long, broad, greenish, with a long thin flat vertex; four longitudinal bright

red stripes extending across vertex and pronotum, the central pair crossing scutellum. Elytra short in female, greatly exceeded by abdomen, nervures broadly reddish or yellowish; in the male, the elytra a little ex-

ceeding in front. Scutellum short. Elytra each with four apical cells.

One of the three Nearctic species of this genus occurs in Illinois on short grasses.

### 1. *Spangbergiella quadripunctata* Lawson

*Spangbergiella quadripunctata* Lawson (1932b, p. 120).

Length 6.0-6.5 mm. Sharp headed, green; vertex and pronotum green or greenish yellow, with two oblique divergent red stripes extending from near the apex of vertex to basal angles of scutellum. Vertex a little longer than basal width, roundedly angulate. Pronotum with a short median red stripe on posterior half. Each elytron with four parallel oblique red bands extending from costal area almost to inner margin.

Female seventh sternite truncate posteriorly. Male valve nearly concealed; each plate broad at base, abruptly narrowed, and produced into long point. The female is usually more yellow in color and less intensely marked with red.

This is a very common species on grasses in low moist meadows or in grassy woodlands. It is widely distributed over the Middle West, and occurs also in some of the eastern states.

**Illinois Records.**—CAVE IN ROCK: Oct. 2, 1934, Frison & Ross, 3 ♀; July 9, 1934, DeLong & Ross, 5 ♂, 8 ♀. DIXON SPRINGS: July 29, 1934, DeLong & Mohr, 1 ♂, 1 ♀; July 9, 1935, Ross & DeLong, 3 ♂, 3 ♀. FERN CLIFF: Aug. 3, 1934, DeLong & Mohr, 1 ♂. KARNAK: Aug. 8, 1934, Ross, DeLong, & Mohr, 1 ♂, 1 ♀. OLIVE BRANCH: Aug. 2, 1934, DeLong & Mohr, 1 ♀. VIENNA: June 14, 1934, DeLong & Ross, 1 ♀; July 29, 1934, DeLong & Ross, 2 ♂, 2 ♀.

### 34. *PARABOLOCRATUS* Fieber

*Parabolocratu*s Fieber (1866, pp. 502, 513).

Fig. 186. Head flattened, well produced, usually narrower than pronotum, with a definite margin, which is often thin and foliaceous; ocelli on margin near the eyes. Elytra macropterous in both sexes and often brachypterous in female.

Twenty species have been found in the United States; of these six are known to occur in Illinois. All of the species are found in marsh habitats on tall grasses.

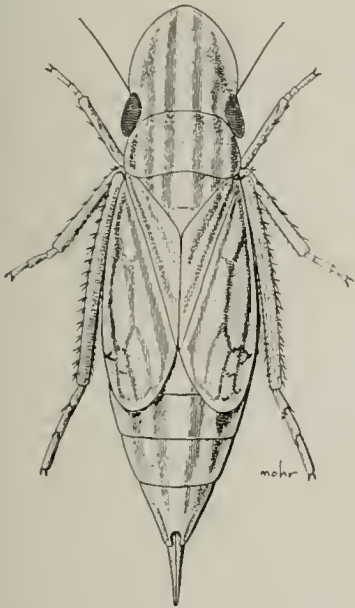


Fig. 190.—*Hecalus lineatus* ♀.

ceeded by the black abdomen and usually crossed by two broad black bands, one across middle and another covering apexes and a part of anteapical cells. Female seventh sternite long, slightly produced at center, appearing like a small lobe. Male plates long, triangular, acutely pointed.

This species ranges from New York west to Kansas, North Dakota, and Colorado. It is abundant in the marshes of the northern one-fourth of Illinois.

**Illinois Records.**—Males and females, taken May 4 to August 23, are from Alsip, Bement, Champaign, Fox Lake, Kankakee, La Grange, Normal, Oak Lawn, St. Anne, Summit, Tolono, Waukegan, and Zion.

### 33. *SPANGBERGIELLA* Signoret

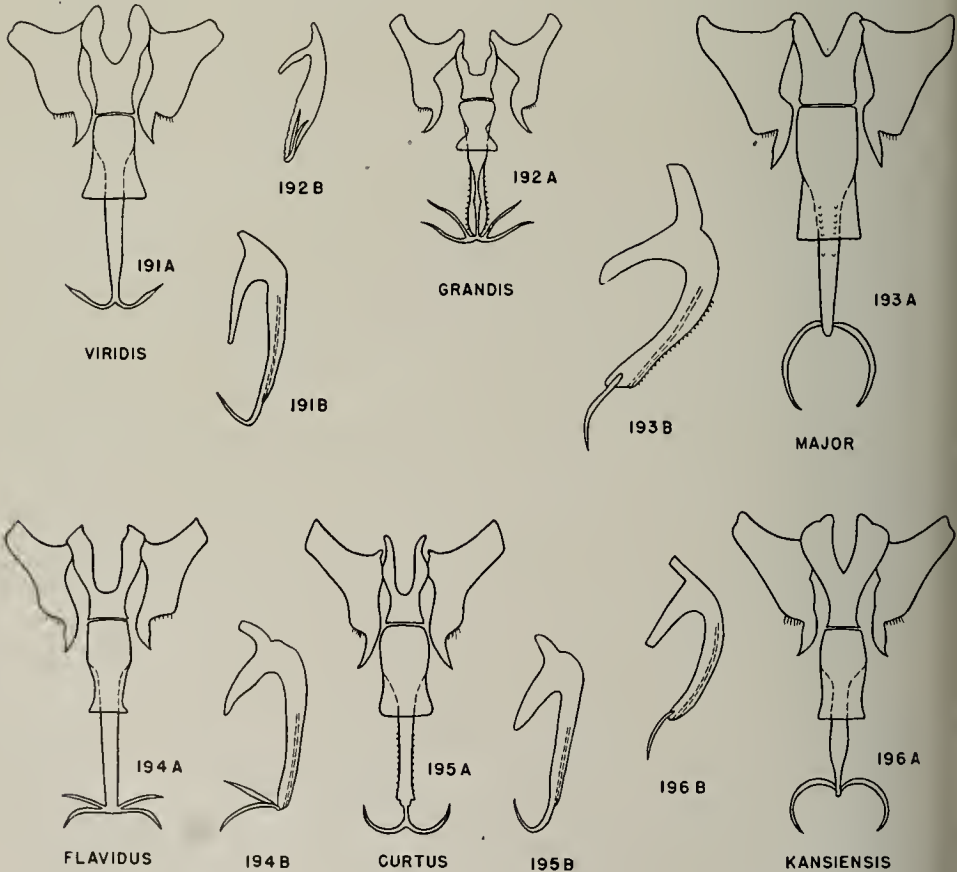
*Spangbergiella* Signoret (1879, p. 273).

Fig. 185. Head strongly produced before the eyes, triangular, ocelli on sharp margin near the eyes. Front rather broad, convex, cheeks with oblique angles rounded. Pronotum twice as wide as long, slightly rounded

KEY TO SPECIES

- 1. Females . . . . . 8
- Males . . . . . 2
- 2. Vertex margin thin, usually foliaceous at apex, usually marked with a brown line just beneath margin. Apical portion of aedeagus with a pair of unbranched lateral processes, as in fig. 191. . . . . 3
- Vertex margin thicker, not thin or foliaceous at apex, usually without a brown line beneath margin. Apical portion of aedeagus with a pair of branched processes. . . . . 7
- 3. Male pygofers each broadly rounded apically, not concavely rounded to the produced apical dorsal lobe nor notched on ventral margin near apex; apex of aedeagus as in fig. 193. . . . . 1. **rotundus**
- Male pygofers each concavely rounded on caudal margin to the produced apical dorsal lobe, or notched on ventral margin near apex, or both. . . . . 4
- 4. Lateral processes of aedeagus arising apically, as in fig. 191. . . . . 5
- Lateral processes of aedeagus arising

- laterally just before apex, as in fig. 193. . . . . 6
- 5. Vertex bluntly produced, about as long as pronotum and at least two-thirds as long as width between eyes . . . . . 2. **viridis**
- Vertex more broadly rounded, about two-thirds as long as pronotum, and about one-half as long as median width between eyes . . . . . 3. **curtus**
- 6. Margin of vertex broadly rounded, about two-thirds as long at middle as basal width. Each pygofer with a prominent notch on ventral margin near apex. . . . . 4. **major**
- Margin of vertex angulate at apex, slightly wider between eyes than median length. Each pygofer scarcely notched on ventral margin near apex. . . . . 5. **kansiensis**
- 7. Aedeagus, fig. 194, tapering on apical half to the bifurcate apical processes, which are about equal in length and widened at middle. Apexes of elytra usually brownish. . . . . 6. **flavidus**
- Aedeagus, fig. 192, roundedly enlarged before apex, then rapidly narrowed to



Figs. 191-196.—*Parabolocratas*, male genitalia. A, ventral aspect; B, lateral aspect of aedeagus. (Redrawn after Shaw.)

the apical bifurcate processes; inner process of each pair considerably longer than the outer. Elytra usually entirely green

8. Vertex as long as or longer than wide . . . . . 7. *grandis*  
 Vertex wider than long . . . . . 9  
 9. A brown line below margin of vertex . . . . . 10  
 Without a brown line below margin of vertex . . . . . 11  
 10. Elytra exceeding ovipositor, vertex at middle distinctly shorter than pronotum . . . . . 3. *curtus*  
 Elytra at least exceeded by tip of ovipositor; vertex about the same length as pronotum . . . . . 2. *viridis*  
 11. Vertex broadly rounded at apex; face appearing in profile rather strongly inflated . . . . . 4. *major*  
 Vertex angularly produced; face scarcely inflated, almost straight . . . . . 12  
 12. Margin of vertex foliaceous; each elytron uniformly greenish but occasionally with small brown spot at tip of clavus . . . . . 5. *kansiensis*  
 Margin of vertex thin but not foliaceous; each elytron with a small brown spot at tip of clavus and another at apex of fourth apical cell . . . . . 6. *flavidus*

#### 1. *Parabolocratrus rotundus* DeLong

*Parabolocratrus rotundus* DeLong (1938d, p. 302).

Length of male 7 mm. Female not known. Color greenish without definite markings. Resembling *major* in form and appearance, but with broadly rounded pygofers. Vertex one-half wider than median length, a little longer than pronotum. Face strongly inflated. Elytra exposing only the pygofers. Male plates about one-half longer than combined basal width, not quite so long as pygofers, which are broadly rounded posteriorly and without a preapical notch on ventral margin. Aedeagus stout, in lateral view decidedly narrowed before apex; apex expanded and bearing a rather long stout lateral process on either side of expanded portion before apex, similar to fig. 193 for *major*. The rounded pygofers will immediately separate this species from any other species of the genus. In the other species, the pygofers are concavely rounded on caudal margins to produced apical lobes, or notched on ventral margins.

This species is known from Illinois and Ohio only.

**Illinois Records.**—DES PLAINES: Sept. 18, 1935, DeLong & Ross, 1 ♂. ZION: July 25, 1934, Frison & DeLong, 1 ♂; Aug. 7, 1935, DeLong & Ross, 3 ♂.

#### 2. *Parabolocratrus viridis* (Uhler)

*Glossocratus viridis* Uhler (1877, p. 462).

Length of male 5.0–6.3 mm., female 6.5–8.5 mm. Large, yellowish green to bright green, with broadly rounded vertex. Vertex shorter than basal width; a brown line, frequently very short, below margin of vertex. Pronotum about the same length as vertex, sometimes slightly longer. Elytra of male extending beyond abdomen; of female exposing one or two abdominal segments (brachypterous) or only the ovipositor (macropterous). Costal margins of elytra usually whitish, apical portions brownish.

Female seventh sternite with posterior margin slightly and roundedly produced or truncate. Male valve broad and triangular. Plates about as long as combined basal width, slightly exceeded in length by pygofers, which are notched on ventral margins near apexes. Aedeagus, fig. 191, tapered to apex, which bears a pair of apical terminal lateral processes.

This species is widely distributed throughout the northern states.

**Illinois Records.**—Many males and females, taken May 7 to September 21, are from Alsip, Amboy, Antioch, Aurora, Cedar Lake, Champaign, Chemung, Decatur, Downs, Eichorn, Elgin, Evergreen Park, Fox Lake, Fulton, Ingleside, Jonesboro, Kimmundy, Kirkwood, Lake Villa, Mayview, Oak Lawn, Ogden, Oquawka, Orangeville, Port Byron, Princeton, Putnam, St. Anne, Sheffield, Sparta, Spring Grove, Sun Lake, Urbana, Volo, Waukegan, and Zion.

#### 3. *Parabolocratrus curtus* Shaw

*Parabolocratrus curtus* Shaw (1932, p. 41).

Length 5.5–6.5 mm. Yellowish green, a dark brown line below margin of vertex in both sexes. Vertex shorter than in *viridis*, much shorter than wide, in male about one-half as long as width between eyes. Pronotum in female a little longer than vertex, in male one-third longer than vertex; lateral margins white. Elytra exceeding abdomen in both sexes; costal margins whitish, apical margins brownish.

Female seventh sternite with posterior margin roundedly produced. Male valve broad and triangular. Plates a little longer than combined basal width. Pygofers a little longer than plates, with a distinct

notch on ventral borders just before apices. Aedeagus, fig. 195, with a pointed projection on either side before apex and a pair of terminal lateral curved processes.

This species, described from Kansas, probably occurs in the western portion of Illinois.

#### 4. *Parabolocratius major* Osborn

*Parabolocratius major* Osborn (1915, p. 110).

Length of male 6.0–6.8 mm., female 7.5–9.0 mm. Yellowish green to green, markings variable. Rather large, round headed, larger and with a broader head than that of *viridis*. Vertex shorter than broad, margin broadly rounded. Pronotum longer than vertex in male, shorter than vertex in female. Elytra of female exposing the last two abdominal segments; elytra of male exceeding length of abdomen.

Female seventh sternite with posterior margin slightly produced. Male valve broad and triangular. Plates a little longer than combined basal width. Pygofers a little longer than plates, ventral margins deeply notched close to apices. Aedeagus, fig. 193, stout, rather broad in lateral view, not narrowed apically; it bears a pair of long lateral processes before apex.

This species is found in the eastern United States and ranges west to Colorado.

It has been taken most commonly in Illinois in *Calamagrostis* meadows and similar marsh habitats.

**Illinois Records.**—Males and females, taken June 10 to September 6, are from Antioch, Des Plaines, Evergreen Park, Fox Lake, Grays Lake, Oak Lawn, St. Anne, Summit, Volo, Wauconda, and Zion.

#### 5. *Parabolocratius kansiensis* Shaw

*Parabolocratius kansiensis* Shaw (1932, p. 47).

Length of male 5.5–5.0 mm., female 8.0 mm. Rather large, pale green, a brown line below margin of vertex in both sexes. Head angulate, vertex wider between eyes than median length, margin decidedly foliaceous. Pronotum in male about equaling vertex in length, in female shorter than vertex. Elytra of female exposing one or two abdominal segments; elytra exceeding length of abdomen in male.

Female seventh sternite with posterior margin broadly rounded. Male valve broad,

triangular, plates about one-fourth longer than combined basal width. Pygofers exceeding length of plates, very faintly notched on ventral margins before apices. Aedeagus, fig. 196, in ventral view strongly narrowed apically and bearing a pair of unbranched processes before apex. Processes evenly curved inwardly.

This species is western in distribution and has been taken only from a marsh in the extreme western portion of the state.

**Illinois Record.**—LIMA: July 29, 1936, Mohr & Burks, 1♂, 2♀.

#### 6. *Parabolocratius flavidus* Signoret

*Parabolocratius flavidus* Signoret (1879, p. 276).

Length of male 4.5–6.0 mm., female 5.5–8.0 mm. Pale green to yellowish green, with angulate head. Vertex in both sexes shorter than wide, but more angulate in the male. Face pale orange below apex. Pronotum as long as vertex. Elytra of female exposing one or two abdominal segments or, in long-winged forms, reaching tip of ovipositor; in male the elytra exceed the abdomen; each elytron usually with a small brown spot at apex of clavus and another at end of fourth apical cell.

Female seventh sternite with posterior margin gradually produced. Male valve short and very narrow. Plates strongly and concavely narrowed apically, a little longer than basal width. Pygofers a little longer than plates, each tapered to pointed apex, not concavely rounded on ventral apical margin. Aedeagus, fig. 194, long in ventral view, with margins tapered to apex, which bears a pair of bifurcate processes on either side; two branches of each process about equal in length.

This species is found in the southeastern states and ranges into Arkansas and Kansas. It is common in the southern portion of Illinois, but has been taken only rarely in the northern half.

**Illinois Records.**—CARBONDALE: July 16, 1909, 1♀. CAVE IN ROCK: July 9, 1935, DeLong & Ross, 8♂, 3♀. DIXON SPRINGS: July 9, 1935, DeLong & Ross, 1♂, 1♀. DONGOLA: on juniper, May 11, 1917, 1♂. EVERGREEN PARK: July 1, 1935, DeLong & Ross, 1♀. THEBES: on cane, July 11, 1935, DeLong & Ross, 1♂. URBANA: Sept. 1, 1889, 1♂.



### 7. *Parabolocratius grandis* Shaw

*Parabolocratius grandis* Shaw (1932, p. 44).

Length of male 5.0–7.0 mm., female 7.5–9.0 mm. Yellowish green, elytra with a small dark brown spot at apex of each clavus. Vertex of female as long as or longer than wide, anterior margin rather broadly rounded; vertex of male wider between eyes than median length, more angulate apically. Pronotum of female much shorter than vertex; pronotum of male as long as vertex. Elytra of female very short, exposing the last four or five abdominal segments; elytra of male long, covering abdomen.

Female seventh sternite with posterior margin truncate or slightly produced medially. Male valve concealed, plates a little longer than basal width, exceeded by pygofers, which are tapered to acutely pointed apices, slightly concave on caudoventral margin. Aedeagus, fig. 192, short, in ventral view roundedly broadened before constricted apex, which bears a pair of bifurcate lateral processes, the inner branch of each longer than outer branch.

This species has been collected in the tall grasses in the marsh habitats of the Chicago area. It is recorded from Florida, Alabama, Texas, and Kansas.

**Illinois Records.**—EVERGREEN PARK: Aug. 23, 1934, DeLong & Ross, 2 ♀; July 1, 1935, DeLong & Ross, 7 ♂, 1 ♀. SUMMIT: July 17, 1936, DeLong & Ross, 1 ♂, 5 ♀; Aug. 21, 1936, DeLong & Ross, 2 ♀.

### 35. *DORYDIELLA* Baker

*Dorydiella* Baker (1897, p. 159).

Fig. 183. Vertex produced, roundedly angulate, foliaceous and upturned at apex; ocelli on margin next to the eyes. Head depressed, longer than pronotum. Elytra long, with apex acutely angled, each with four apical cells and two anteapicals; each clavus with two longitudinal veins.

Two species have been described or placed in this genus.

#### 1. *Dorydiella kansana* Beamer

*Dorydiella kansana* Beamer (1945, p. 48).

Length 8 mm. Large, yellowish, with brown markings, superficially resembling a *Paraphlepsius* such as *ramosus*. Vertex flat,

margin foliaceous and with brown spots. Face irrorate. Pronotum with brown longitudinal striae. Elytra long, apex acutely angled; ramose pigmented lines arranged longitudinally between the veins; a brown spot at apex of each elytron.

Female seventh sternite with three short rather broad V-shaped notches on the posterior margin and appearing serrate. Male plates triangular, pointed, almost as long as combined basal width. The nymphs have a long flat vertex similar to that of *Dorycephalus* adults, but during development to maturity this becomes shorter and forms a rather broad roundedly angled vertex.

The species has been found abundantly at the margins of lagoons along the shores of the Great Lakes, where it lives in the *Scleria-Eleocharis* association. It also occurs on small plants in the fresh-water marsh but less abundantly.

**Illinois Records.**—PRINCETON: swamp, July 7, 1934, DeLong & Ross, 4 nymphs. SHAWNEETOWN: June 27, 1936, DeLong & Mohr, 2 nymphs. WAUKEGAN: Aug. 5, 1935, Ross & DeLong, 1 ♂, 2 ♀. ZION: July 25, 1934, Frison & DeLong, 1 ♂.

### 36. *DICYPHONIA* Ball

*Dicyphonia* Ball (1900a, p. 69).

General form of *Parabolocratius*; vertex narrower, shorter, and more angular than in *Hecalus*. Disc of vertex concave, margins sharp, slightly foliaceous. Ocelli on margin close to eyes. Pronotum as wide as head across eyes and broadly rounded anteriorly.

Five species belonging to this genus are now listed for North America by Beamer (1936a); none of these has been collected in Illinois. In view of its known distribution, *ornata* may be found in the western portion of the state. All five species are apparently western in distribution.

#### 1. *Dicyphonia ornata* (Baker)

*Platymetopius ornatus* Baker (1900b, p. 49).

*Dicyphonia ramentosa* Ball (1900a, p. 69).

Fig. 188. Length 5.25 mm. Yellowish, with produced vertex, rounded at apex and three-fourths as wide between eyes as median length. Vertex with a pair of dark spots behind apex, these usually fused; posterior to this are three abbreviated transverse bands, which are fused medially so as

to form a broad irregularly outlined longitudinal band. Pronotum with two short transverse bars anteriorly, and irregular dark markings on lateral portions. Elytra smoky on posterior portion, each with white spots. Male plates small, each broad at base, suddenly narrowed beyond middle into slender acute apex.

This species has been collected in Kansas, Colorado, and Utah.

### Subfamily APHRODINAE

Although the genera of this group vary considerably in size and shape, all have the ocelli distant from eyes, and, except in *Xestocephalus*, the ocelli are just above the margin of the vertex. Four genera are recorded in this subfamily for the United States, and three of these have been taken in Illinois.

#### KEY TO GENERA

1. Vertex rather flat, with acute margin forming definite limitations of vertex and front, fig. 32.....2  
Vertex sloping and rounding to front, with thick margin, or without definite margin, fig. 197.....3
2. Vertex transversely striate behind front margin between each eye and ocellus; length 5.0 to 6.0 mm.....37. *Stroggylocephalus*  
Vertex granulate behind front margin between each eye and ocellus; length 3.0 to 4.5 mm. Females of.....38. *Aphrodes*
3. Vertex nearly evenly rounded to front, with each ocellus about midway between eye and apex of vertex, fig. 197; pronotum extremely, finely, transversely wrinkled.....40. *Xestocephalus*  
Vertex more flattened and distinctly angled with front, as in fig. 32; pronotum conspicuously, transversely wrinkled.....4  
4. Each ocellus close to eye, about one-fourth distance between it and apex of vertex; width of vertex about one and one-half times its length, fig. 198.....39. *Memnonia*  
Each ocellus about one-half distance between eye and apex of vertex; width of vertex nearly twice its length. Males of.....38. *Aphrodes*

### 37. *STROGGYLOCEPHALUS* Flor

*Stroggylocephalus* Flor (1861, p. 210).

Vertex produced, obtusely angled, transversely striate in front. Margin foliaceous, ocelli close to front margin. Elytra coriaceous, each narrowly rounded at apex, coarsely punctate, appendix absent.

Only one northern species of this genus is known to occur in the United States.

### I. *Stroggylocephalus agrestis* (Fallen)

*Cicada agrestis* Fallen (1806, p. 23).

*Tettigonia mixta* Say (1825, p. 341).

Length 6-7 mm. Grayish yellow to dark brown, frons black, finely irrorate with pale brown. Vertex striate in front, smooth at base. Pronotum transversely striate. Elytra with the inner margins, bars and spots along nervures, and 12 or more spots on each costa brown or blackish. The female is usually paler than male and with fewer markings. Female seventh sternite concave, notched at middle.

This species occurs in moist grassy areas from New York to Colorado.

**Illinois Records.**—NORMAL: March 27, 1884, 2 ♀. CARY: grassy marsh, Nov. 26, 1946, Ross & Burks, 1 ♂, 1 ♀.

### 38. *APHRODES* Curtis

*Aphrodes* Curtis (1833, p. 195).

*Acucephalus* Germar (1833, p. 181).

*Pholetaera* Zetterstedt (1838, col. 288).

*Anoscopus* Kirschbaum (1858b, p. 357).

Fig. 32. Vertex obtusely angular, produced, in female usually tricarinate. Ocelli on front margin a little nearer the eyes than the apex.

Five species of this genus occur in the United States, all eastern in distribution. One species is known from Illinois.

### I. *Aphrodes albifrons* (Linnaeus)

*Cicada albifrons* Linnaeus (1758, p. 437).

*Cicada nitidula* Donovan (1799, p. 87, pl. 288, fig. 1).

*Aphrodes concinna* Curtis (1837, pl. 633).

*Aphrodes testudo* Curtis (1837, pl. 633).

*Pholetaera nigropunctata* Zetterstedt (1838, col. 288).

*Pholetaera livens* Zetterstedt (1838, col. 288).

*Acucephalus interruptus* Scott (1873, p. 264).

*Acucephalus polystolus* Scott (1873, p. 265).

*Acucephalus circumflexus* Provancher (1889, p. 282).

Length 3-4 mm. Rather small, variable in color, yellowish to brown, front pale. Female usually irrorate with black or brown; male with white spots on elytra, often in the form of large blotches or transverse bands. In the male, the elytra are usually shorter, exposing the tip of the abdomen.

Female seventh sternite with posterior

margin broadly and angularly emarginate to a central short U-shaped notch. Male plates more than twice as long as basal width, convexly narrowed on inner margins to bluntly pointed apices; inner margins contiguous, outer margins straight, causing plates to bend to a vertical position at apexes.

This species ranges from New York to Wisconsin. It has an unusual habit for a member of the leafhopper group. Normally subterranean, it feeds for the most part upon grass roots. However, it has been swept from vegetation. Its distribution may be much wider than the records indicate.

**Illinois Records.**—Many males and females, taken June 9 to August 28, are from Algonquin, Apple River Canyon State Park, Chicago, Dolson, Kankakee, Mokena, St. Joseph, Starved Rock State Park, Sun Lake, Urbana, and Waukegan.

### 39. MEMNONIA Ball

*Memnonia* Ball (1900a, p. 66).

Fig. 198. In general form similar to *Aphrodes*, and with a convex sloping vertex, which has a rather thick margin. Ocelli on margin, distant from the eye. Face forming an acute angle with the vertex. Pronotum as long as vertex, strongly and transversely wrinkled. Macropterous and brachypterous forms.

Five species of this genus are listed for North America, but none of these has been taken in Illinois. Since two of them occur in the states just west of Illinois, and they are short grass species, it is possible they may be collected at some future time in Illinois.

#### 1. *Memnonia consobrina* Ball

*Memnonia consobrina* Ball (1900a, p. 66).

Length of male 3.0 mm., female 4.0–4.25 mm. Resembling *Aphrodes* in general form and appearance. Vertex roundedly produced, twice as wide between eyes as median length in female; vertex more pointed in male. Both macropterous and brachypterous forms are known. Female with vertex, pronotum, and scutellum green or yellowish green, elytra brownish or dark green, with nervures brown; face black to green, abdomen black. Male shiny black, eyes pale; elytra each with three or four white spots in a row across anteapical cells.

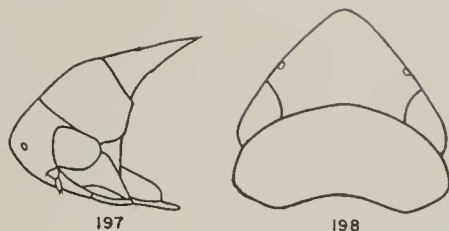


Fig. 197.—*Xestocephalus pulicarius*, lateral aspect of head and thorax.

Fig. 198.—*Memnonia consobrina*, dorsal aspect of head and thorax.

Female seventh sternite with posterior margin shallowly emarginate, bearing a median blunt tooth. Male valve scarcely visible. Plates only about half as wide at base as preceding segment, about three times as long as basal width, narrowed to acute tips.

This is a grass-feeding species that occurs on the prairie. It has been found abundantly in Colorado and Nebraska.

### 40. XESTOCEPHALUS Van Duzee

*Xestocephalus* Van Duzee (1894b, pp. 197, 214).

Fig. 197. General form ovate, head narrower than pronotum, subconical, vertex convex, sloping. Ocelli on anterior margin, distant from eyes. Antennae close to eyes. Elytra appearing rugose, without appendix, and with several apical areolate spots.

All of the species are small, usually not exceeding 4 mm. With few exceptions they are similar in color, and the genital structures of all the species are quite similar for either sex. As a result they are difficult to separate.

Peters (1933) and Knull (1944) record 14 species in this genus for the United States, most of which are found in the East. Four species have been collected in Illinois, and at least two others may occur here.

#### KEY TO SPECIES

1. Vertex with distinct markings in the form of lines or spots . . . . . 2  
 Vertex without distinct markings, with areas of uniform coloration . . . . . 3
2. Pronotum brown, with a broad white transverse band on posterior half, fig. 199 . . . . . 1. *coronatus*  
 Pronotum brown, marked with pale spots, without transverse band . . . . . 2. *pulicarius*
3. Length 4.0 mm.; black in color . . . . . 3. *piceus*

- Length not exceeding 3.75 mm.; brown or black.....4  
 4. Black in color.....4. **nigrifrons**  
 Brown in color.....5  
 5. Vertex pale brown; elytra brown, with a few hyaline markings near apexes. Length about 2 mm.....5. **brunneus**  
 Vertex pale brown, often with faint markings. Length 3 mm. or more.....6. **superbus**

1. *Xestocephalus coronatus* Osborn  
& Ball

*Xestocephalus coronatus* Osborn & Ball (1897, p. 184).

Fig. 199. Length 2.5–3.0 mm. Vertex roundedly produced, about half as long as basal width between the eyes. Color white, with a large brown spot encircling each ocellus and extending two-thirds the length of vertex, leaving a median white longitudinal area, which is slightly divided by a brownish crossband back of apex. Face pale brown. Pronotum one-third longer than vertex, dark brown, with a broad white transverse band on posterior half. Scutellum brown, apical half paler. Elytra brown, each with paler areas, especially on the apical third; portions of veins on clavus and corium white.

This species is recorded from Iowa, Nebraska, and Wisconsin. Although only one specimen has been taken in Illinois, the species undoubtedly has a wider distribution in the state than this single collection indicates.

**Illinois Record.**—MARSHALL: Sept. 27, 1934, Frison & Ross, 1 ♀.

2. *Xestocephalus pulicarius* Van Duzee

*Xestocephalus pulicarius* Van Duzee (1894b, pp. 197, 215).

Length 2.5–3.0 mm. Small, brown, with distinct and conspicuous pale markings. Vertex rounded, with fulvous apex; a yellow line next to each eye extending toward apex, and a yellow line on posterior margin from which two lines extend forward and curve on disc; pronotum as long as vertex. Elytra marked with many white spots. Female seventh sternite emarginate, with a slightly produced lobe on either side. Male plates tapered beyond the middle to obtuse apexes.

Peters (1933) separated and described several new species of *Xestocephalus*. He

separated *similis* from *pulicarius* on the basis of a hooked process on the heel of the foot-shaped terminus of the style. In the present series of Illinois material, there are all gradations of this process from the process in the form he has designated as *pulicarius* to the strongly produced process he illustrated for *similis*. If *similis* is a distinct form, the character of the style cannot adequately be used for the separation of these species. It is the writer's opinion that *pulicarius* is a species with a great number of color variations that cannot be separated from one another by structural characters.

This is the most common species of the genus in Illinois and occurs on herbaceous



Fig. 199.—*Xestocephalus coronatus*. (From Osborn.)

vegetation, especially at the edge of woodland or in open wooded areas. It ranges from the eastern United States west to Utah.

**Illinois Records.**—Many males and females, taken March to November 13, are from Adair, Albion, Algonquin, Apple River Canyon State Park, Cave in Rock, Champaign, Clayton, Danville, Dolson, Dongola, Dubois, Fulton, Geff, Grand Detour, Havana, Herod, Hopedale, Horseshoe Lake, Kankakee, Karnak, La Grange, Marshall, Muncie, Oak Lawn, Oakwood, Olive Branch, Oquawka, Palos Park, Pere Marquette State Park, Pike, Pittsfield, Putnam, Rock Island, St. Anne, Sugar Grove, Temple Hill, Thebes, Urbana, Vienna, Volo, White Heath, White Pines Forest State Park, and Wilmington.

3. *Xestocephalus piceus* Osborn

*Xestocephalus piceus* Osborn (1928, p. 244).

Length 4 mm. Mostly black, with apex of vertex and upper part of face dark brown; elytra with paler spots on each

costa near apex. Vertex about twice as long at middle as length next to eyes. Genitalia not differing from those of other species in the genus. Pronotum a little longer than vertex.

This species occurs in southern Ohio and may be taken in Illinois in future collections.

4. *Xestocephalus nigrifrons* Osborn

*Xestocephalus nigrifrons* Osborn (1915, p. 109).

Length 3 mm. Mostly black, as in *piceus*, but with a black face and smaller in size. This species may be only a very dark form of *pulicarius*, which is quite variable in color pattern. Although *nigrifrons* has not been collected in Illinois, specimens that are considered as *nigrifrons* have been found in Tennessee, and other specimens of this species might possibly be taken at some time in the southern portion of Illinois. It is also recorded from Maine.

5. *Xestocephalus brunneus* Van Duzee

*Xestocephalus brunneus* Van Duzee (1907, p. 62).

Length 2 mm. Small, pale brown, without markings on the vertex. Vertex short, rounded, less produced than in *pulicarius*. Pronotum pale brown behind eyes. Each elytron dark at base, without spots, apical half paler, with spotted areas; quadrate spot on middle of costa, a smaller and darker one beyond this, and the apex broadly darker; two pale spots beyond the clavus along the sutural margin. Male genitalia similar in structure to those of other species of the genus.

Specimens that are identified as of this species have been taken in Illinois from herbaceous vegetation. The range of this species is in the eastern United States.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, DeLong & Ross, 1 ♀; June 29, 1935, DeLong & Ross, 4 ♀. EICHORN: May 11, 1935, Mohr, 4 ♂, 2 ♀. GRAFTON: along river, June 26, 1934, DeLong & Ross, 1 ♀. SPRINGFIELD: June 12, 1935, DeLong & Mohr, 2 ♂, 2 ♀. URBANA: June 20, 1915, 1 ♀; June 2, 1916, 1 ♂; June 17, 1916, 4 ♂; Sept. 12, 1934, Rice, 1 ♂. VIENNA: June 14, 1934, DeLong & Ross, 4 ♀.

6. *Xestocephalus superbus* (Provancher)

*Deltocephalus superbus* Provancher (1890, p. 339).  
*Xestocephalus fulvocapitatus* Van Duzee (1894b, pp. 197, 215).

Length 3.5 mm. Pale yellowish to brownish, with faint markings on the head, median longitudinal line paler than remainder of head. Pronotum light brown, with numerous white spots. Scutellum with darker basal angles. Elytra light brown, with darker spots on apical and costal areas, each with two pale spots on claval suture. Genital characters not different from those of other species of the genus.

This species, common in Illinois on herbaceous growth in open wooded areas, is distributed through the eastern states.

**Illinois Records.**—Males and females, taken May 8 to October 2, are from Aldridge, Algonquin, Danville, Dolson, Dongola, Dubois, Elizabethtown, Goreville, Hopedale, Marshall, Oak Lawn, Savanna, Urbana, and Wilmington.

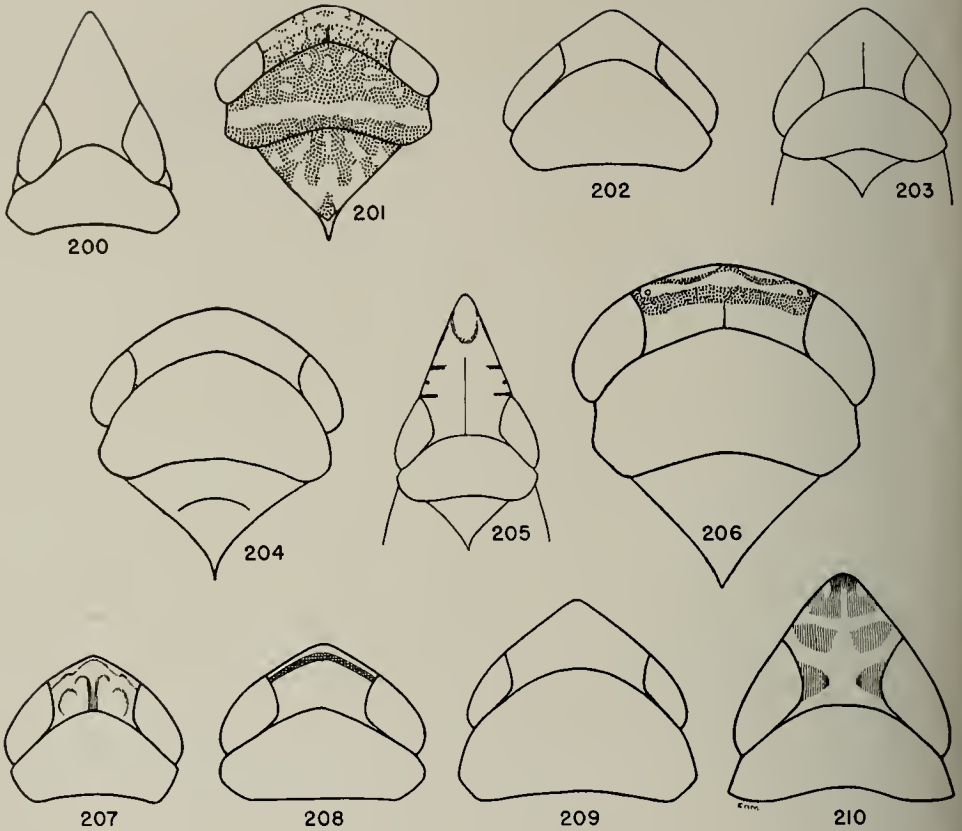
Subfamily ATHYSANINAE

All the members of this group have the ocelli on or very near the front margin of the vertex and close to the eyes. The length and degree of thickness of the margin vary greatly among the genera.

This subfamily contains about 90 genera in the Nearctic region, and it is the largest group in the Cicadellidae. Sixty-two genera are treated in this report.

KEY TO GENERA

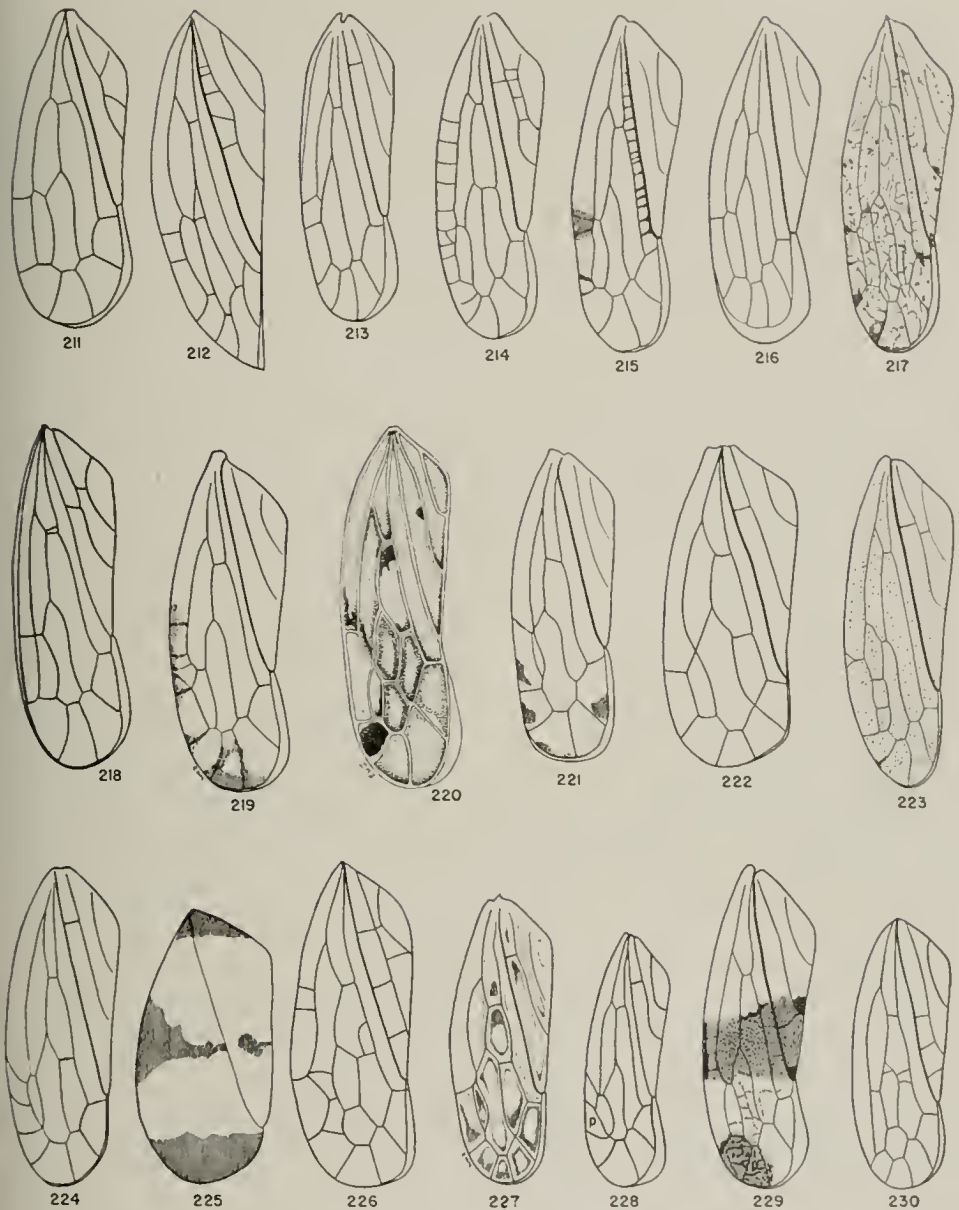
1. Gena visible behind or below eye from dorsal view, fig. 200 ..... 2  
    Gena not visible behind eye from dorsal view, as in fig. 201 ..... 4
2. Elytra each with one cross nervure between first and second sectors; only two veinlets reaching costal margin, fig. 211 ..... 47. *Japananus*  
    Elytra each with two cross nervures between first and second sectors, as in fig. 214; numerous veinlets reaching costal margin ..... 3
3. Pale brown, with a broad pale yellowish longitudinal stripe extending from apex of vertex to apex of clavus; male aedeagus, fig. 241, without a pair of long slender processes ..... 48. *Scaphytopius*  
    Brown or black, without a longitudinal yellow stripe from vertex to clavus; male aedeagus, figs. 300-325, with a dorsal process and a pair of long slender processes ..... 49. *Cloanthanus*



Athsyaninae heads and pronota

Fig. 200.—*Cloanthanus cuprescens*.  
 Fig. 201.—*Remadosus magnus*.  
 Fig. 202.—*Tropicanus costomaculatus*.  
 Fig. 203.—*Lonatura catalina*.  
 Fig. 204.—*Chlorotettix unicolor*.  
 Fig. 205.—*Acurhinus pyrops*.  
 Fig. 206.—*Limotettix divaricatus*.  
 Fig. 207.—*Atanus perspicillatus*.  
 Fig. 208.—*Amplicephalus estacadus*.  
 Fig. 209.—*Thamnotettix simplex*.  
 Fig. 210.—*Gillettiella atropuncta*.

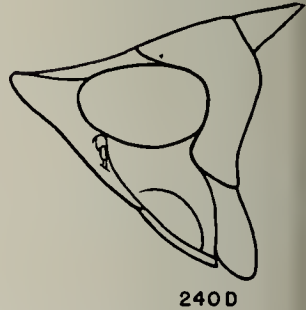
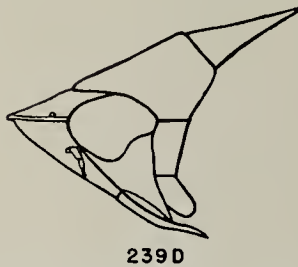
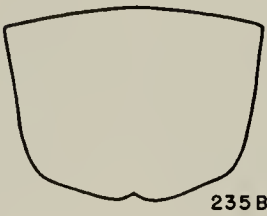
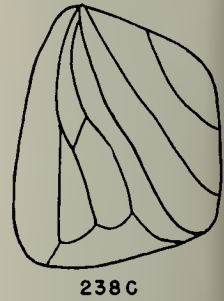
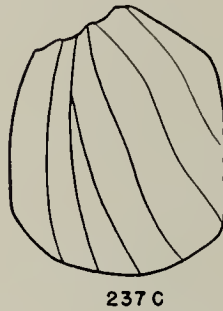
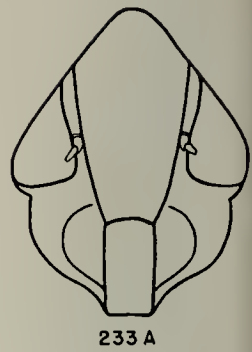
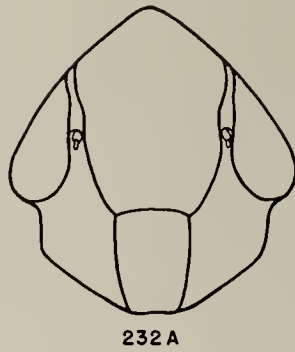
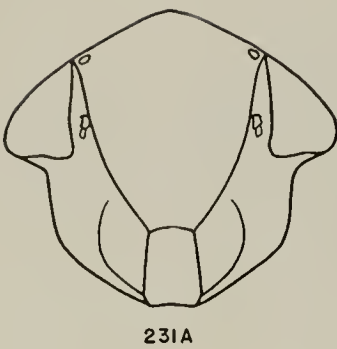
4. Clypeus broadest at apex and constricted at base or broadly constricted at middle, as in fig. 231A.....6
- Clypeus usually parallel sided, or narrowed at apex, not broadest at apex, as in fig. 232A.....5
5. Elytra very short, exposing at least five abdominal segments, as in fig. 403; veins of each elytron, if not obscured, reaching apex or only rarely with short cells at apex of elytron, as in figs. 237C, 238C.....18
- Elytra long, usually covering abdomen; at least one larger closed cell before apex of each elytron.....35
6. Costal margin of each elytron evenly rounded to the straight inner margin so that apex appears pointed, fig. 212.....89. **Acinopterus**
- Apex of each elytron rounded, not pointed.....7
7. Elytra marked with ramose pigment lines or vermiculate lines or merging spots or dots, as in fig. 217.....8
- Elytra with various color markings but without ramose or vermiculate pigment markings.....14
8. Markings on elytra in the form of a saddle or broken band, fig. 229; vertex short, with an impressed transverse furrow just back of anterior margin.....82. **Norvellina**
- Elytra without saddle markings, or vertex without a transverse furrow.....9
9. Vertex parallel margined and about four times as wide as median length, fig. 201.....83. **Remadosus**
- Vertex longer at middle than next to eyes, fig. 202, and not more than three times as wide as long.....10
10. Head at least as wide as pronotum.....11
- Head narrower than pronotum.....12



Athysaninae elytra. Abbreviation: "p" = postnodal cell.

- Fig. 211.—*Japananus hyalinus*.
- Fig. 212.—*Acinopterus acuminatus*.
- Fig. 213.—*Davisonia major*.
- Fig. 214.—*Aligia modesta*.
- Fig. 215.—*Prescottia lobata*.
- Fig. 216.—*Exitianus obscurinervis*.
- Fig. 217.—*Paraphlepsius tenessa*.
- Fig. 218.—*Bandara johnsoni*.
- Fig. 219.—*Menosoma cincta*.
- Fig. 220.—*Arundanus proprius*.

- Fig. 221.—*Palus delector*.
- Fig. 222.—*Latulus sayi*.
- Fig. 223.—*Fieberiella florii*.
- Fig. 224.—*Flexamia inflata*.
- Fig. 225.—*Unoka ornata*.
- Fig. 226.—*Polyamia zveedi*.
- Fig. 227.—*Hebecephalus cruciatus*.
- Fig. 228.—*Scaphoides immistus*.
- Fig. 229.—*Norvellina seminuda*.
- Fig. 230.—*Amplicephalus osborni*.



Athysaninae. A, face; B, seventh sternite of female; C, elytron; D, lateral aspect of head and thorax.

Fig. 231.—*Paraphlepsius optatus*.  
 Fig. 232.—*Flexamia inflata*.  
 Fig. 233.—*Gillettiella atropuncta*.  
 Fig. 234.—*Colladonus clitellarius*.  
 Fig. 235.—*Idiodonus kennicotti*.

Fig. 236.—*Psammotettix striatus*.  
 Fig. 237.—*Athysanella acuticauda*.  
 Fig. 238.—*Lonatura catalina*.  
 Fig. 239.—*Fieberiella florii*.  
 Fig. 240.—*Doratura stylata*.

- 11. Lateral margins of pronotum very short, eyes extending back almost to base of elytra, fig. 202. . . . . 84. **Tropicanus**  
 Lateral margins of pronotum longer, eyes distinctly separated from base of elytra, figs. 422, 423. . . . . 85. **Paraphlepsius**
- 12. Vertex with two large black spots on margin. Male plates, fig. 242, deeply notched on outer margins. . . . . 79. **Orienteus**  
 Vertex without marginal spots; male plates not notched on outer margins. . . . . 13

- 13. Head about three-fourths as wide as pronotum. Anterolateral margin of pronotum strongly sloping to eyes. Elytra decidedly elongate. Male pygofers each with a pronounced rounded apical lobe. Female seventh sternite truncate, with a median narrow incision, figs. 429-432. . . . . 87. **Iowanus**  
 Head only slightly narrower than pronotum; anterolateral margin of pronotum less sloping to eyes, as in fig. 422. Elytra rather short and broad. Male pygofers without apical rounded lobes,



fig. 428. Female seventh sternite excavated or broadly notched, fig. 428.

86. *Texananus*

14. Claval veins of each elytron obliquely angled with commissural margin, as in fig. 423

Claval veins of each elytron bent so as to meet commissural margin at right angle, fig. 215

15. Elytron with supernumerary veinlets along claval suture, fig. 215  
Elytron without supernumerary veinlets along claval suture, fig. 228

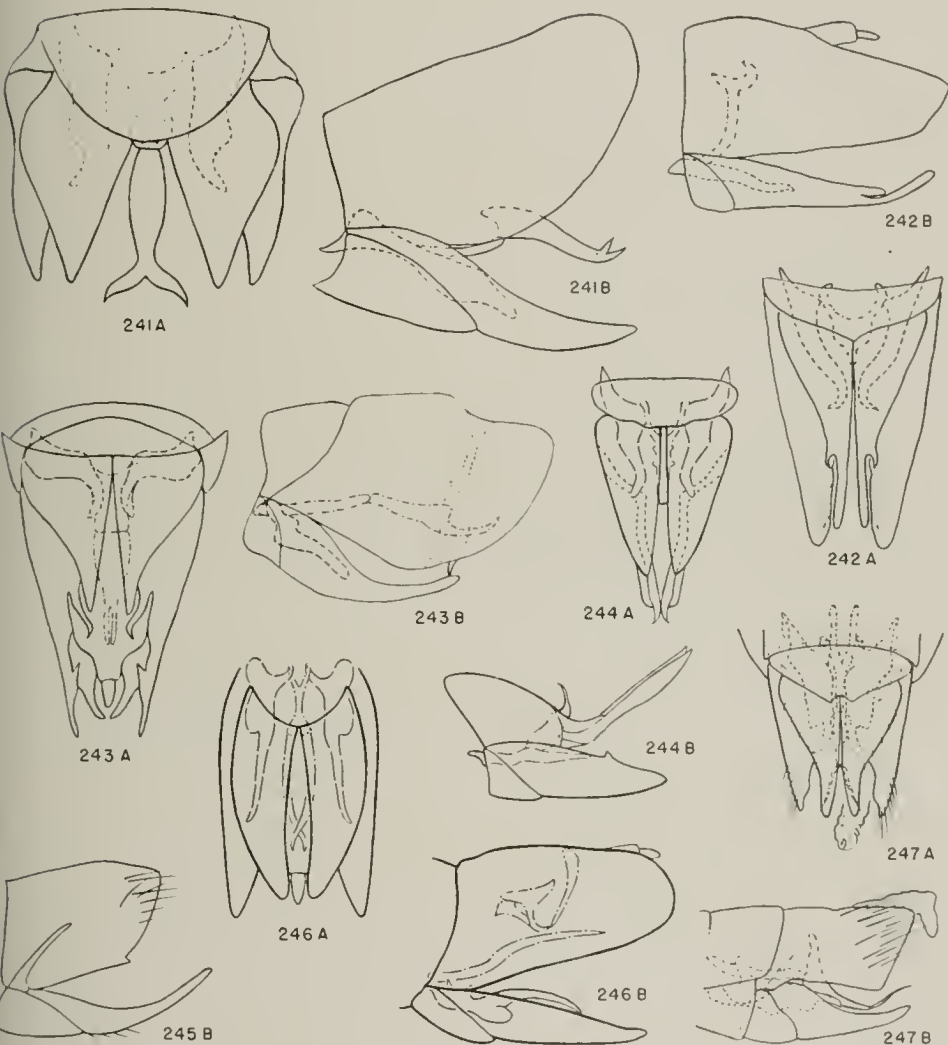
16. Male plates long and attenuated, figs. 280-286; one or two veinlets arising from outer anteapical cell and reaching costal margin

43. *Osbornellus*

Male plates variable, not attenuated; two to four veinlets arising from outer anteapical cell, fig. 228

17. Male plates, fig. 246, gradually tapered to bluntly pointed apices, almost as long as pygofers, and reaching to tip of anal tube

42. *Lonenus*



Athysaninae male genitalia. A, ventral aspect; B, lateral aspect.

Fig. 241.—*Scaphytopius elegans*.

Fig. 242.—*Orientus ishidae*.

Fig. 243.—*Fieberiella florii*.

Fig. 244.—*Paluda mella*.

Fig. 245.—*Macrosteles divinus*. (Redrawn after Dorst.)

Fig. 246.—*Lonenus intricatus*.

Fig. 247.—*Doleranus viridus*.

- Male plates, figs. 248-279, much shorter, not reaching anal tube. . . . .
18. Vertex very narrow and conical, one and one-third times as long as width between eyes, fig. 210; antennal fossa touching eye, fig. 233*A*. . . . .
- . . . . . **66. Gillettiella**
- Vertex equal to or less than width between eyes, as in fig. 209. . . . . 19
19. Anterior margin of vertex sharply angled with front, the apex slightly turned up, fig. 240*D*. . . . .
- . . . . . **69. Doratura**
- Anterior margin of vertex bluntly angled or rounded to front. . . . . 20
20. Wing veins usually indistinct. . . . . 21
- Five distinct veins, an outer one forked near middle, fig. 237*C*. . . . .
- . . . . . **71. Athysanella**
21. Color uniformly straw yellow; antennal fossa touching eye or extremely close, as in fig. 233*A*; vertex conical, fig. 203. . . . .
- . . . . . **56. Lonatura**
- Body black or bicolored; antennal fossa separated from eye by at least half its width; vertex evenly rounded, fig. 403. . . . .
- . . . . . **70. Driotura**
22. Dark straw colored above, the entire dorsum covered with many very small brown dots; outer anteapical cell, fig. 223, divided, with one to three crossveins reaching costal margin from anterior cell; front margin of vertex thin and sharply angulate, fig. 239*D*. . . . .
- . . . . . **88. Fieberiella**
- Color variable but without small brown dots; outer anteapical cell usually entire, as in fig. 218. . . . . 23
23. Four or more crossveins reaching costal margin from outer anteapical cell and outer branch of the first sector, figs. 214, 295. . . . . 24
- Two crossveins reaching costal margin from outer anteapical cell and none from outer branch of first sector, as in fig. 218. . . . . 27
24. Margin of vertex acutely angled with front. . . . . 25
- Margin of vertex obtusely angled with front. . . . . 26
25. Vertex narrowly and transversely depressed behind anterior margin; numerous crossveins on discs of elytra next to each claval vein, fig. 295. . . . .
- . . . . . **80. Mesamia**
- Disc of vertex flat, slightly depressed but not narrowed behind margin, fig. 298; elytra without crossveins next to each claval vein. . . . . **46. Platymetopius**
26. Costal veins conspicuously expanded on margin, fig. 219. . . . . **78. Menosoma**
- Costal veins even in width, scarcely at all expanded on margin, fig. 214. . . . .
- . . . . . **81. Aligia**
27. Vertex nearly acutely angled with front and with a slight transverse depression behind apex. . . . . 28
- Vertex more bluntly angled with front and without depression behind apex. . . . . 29
28. Vertex finely and longitudinally striate; pronotum finely and transversely striate. . . . . **91. Eutettix**
- Vertex and pronotum smooth and without striae. . . . . **90. Bandara**
29. Side of pronotum behind eye extremely narrow, fig. 207. . . . . **94. Atanus**
- Side of pronotum behind eye at least as wide as posterior tibia at base, fig. 204. . . . . 30
30. Width of vertex more than twice its median length, fig. 204, and generally more rounded to front. . . . . 31
- Width of vertex not more than twice its median length, fig. 463, and generally more flattened and angulate with front. . . . . 33
31. Color generally uniformly green or straw yellow, and not sharply contrasting on dorsum or with dark spots on vertex. . . . .
- . . . . . **92. Chlorotettix**
- Colors usually sharply contrasting, or nearly uniformly dark brown, with dark spots on vertex. . . . . 32
32. Female seventh sternite, fig. 234*B*, excavated, with a long spatulate process at middle of excavation; elytra dark brown, with a yellow saddle spot on each clavus, fig. 465 (Illinois species). . . . .
- . . . . . **99. Colladonus**
- Female seventh sternite, fig. 235*B*, produced on posterior margin and with a slight median incision; elytra variously colored. . . . . **98. Idiodonus**
33. Anterior margin of vertex with black spots or bands, figs. 462, 463. . . . . **96. Cicadula**
- Margin of vertex without black spots or bands. . . . . 34
34. Male plates, fig. 244, each with dorsal blunt spine on apical half; each pygofer terminating in a bladelike process as long as basal portion. . . . . **97. Paluda**
- Male plates each without dorsal spine, as in fig. 247; each pygofer rounded or angled. . . . . 35
35. Seventh sternite of female deeply and sinuately emarginate; outer margin of male plate, fig. 247, sinuate before apex. . . . . **93. Doleranus**
- Seventh sternite of female slightly emarginate or a little produced; outer margin of male plate, fig. 461, evenly curved to apex. . . . . **95. Elymana**
36. At least pronotum and elytra entirely black; outline of veins indistinct on discs of elytra. . . . . 37
- Pronotum and elytra not entirely black; outline of veins usually distinct. . . . . 38
37. Vertex bluntly angled; head wider than pronotum, fig. 409. . . . . **74. Ophiola**
- Vertex almost evenly rounded; head and pronotum subequal in width, fig. 403. . . . .
- . . . . . **70. Driotura**
38. Color pale green, with a large isolated dark spot in middle of each elytron. . . . .
- . . . . . **51. Flexamia**
- Color variable and without isolated black spot. . . . . 39
39. Elytra with a large irregular brown X-shaped mark, the lower arms joined on suture by an irregular band. . . . .
- . . . . . **45. Sanctanus**

- Elytra without X-shaped mark 40
40. Elytra milky white, with three complete brown to black cross bands, one at base, a median band, and a subapical one, fig. 225 . . . . . **64. Unoka**  
Elytra with not more than two cross bands . . . . . 41
41. Pronotum with four or six longitudinal dark stripes, the median pair continued on the pronotum, as in fig. 401 . . . . . 42  
Pronotum without stripes continued on pronotum . . . . . 43
42. Vertex longer than wide and with two longitudinal stripes anterior to median pronotal pair, fig. 327 . . . . . **51. Flexamia**  
Vertex wider than long, with two rounded spots anterior to median pair of pronotal stripes, figs. 392, 394 . . . . . **68. Commellus**
43. Dorsum with a single broken longitudinal dark band extending from apex of vertex to apex of clavus; entire end of each elytron with wide appendix **51. Flexamia**  
Dorsum without a single median band; each elytron with appendix variable . . . . . 44
44. Inner sector of each elytron not forked and with only two anteapical cells, fig. 213 . . . . . 68  
Inner sector of each elytron twice forked, forming three anteapical cells, as in fig. 227 . . . . . 45
45. Elytra each with two or more crossveins between first and second sectors, as in fig. 224 . . . . . 46  
Elytra each with not more than one cross-vein between first and second sectors, as in fig. 216 . . . . . 59
46. Vertex fully twice as long as wide and depressed on each side of apex below margin, fig. 205 . . . . . **50. Acurhinus**  
Vertex much less than twice as long as wide and convex on each side of apex below margin . . . . . 47
47. Usually four to eight crossveins on each clavus, as in fig. 226 . . . . . 48  
Usually not more than one to three cross-veins on each clavus . . . . . 49
48. Length usually exceeding 4 mm.; vertex about one and one-half times as wide as long, fig. 208 . . . . . **60. Amplicephalus**  
Length usually less than 3 mm.; median length of vertex and width subequal . . . . . **54. Polyamia**
49. Central anteapical cell divided, fig. 220; apical cells sometimes very short . . . . . 50  
Central anteapical cell not divided, fig. 224; apical cells usually longer . . . . . 52
50. Inner apical cell of each elytron with a dark spot inside the posterior angle, fig. 221 . . . . . **53. Palus**  
Inner apical cell of each elytron without a spot inside posterior angle, although veins may be marked with fuscous, fig. 220 . . . . . 51
51. Length usually 4 mm. or more; disc of vertex flat or even slightly depressed . . . . . **61. Arundanus**  
Length usually less than 3 mm.; disc of vertex convex . . . . . **55. Deltoccephalus**
52. Costal region of each elytron with strongly reflexed veins arising from outer anteapical cell and reaching costal margin, fig. 224; head with a small depression behind apex . . . . . **51. Flexamia**  
Costal veins usually at most only slightly angulate forward from outer anteapical cell, fig. 221; head without depression behind apex, although it may be somewhat flattened between eyes . . . . . 53
53. Color above uniformly straw yellow, orange, or brown, and without markings, fig. 203 . . . . . **56. Lonatura**  
Color variable but always with additional markings on head, pronotum, or elytra . . . . . 54
54. Inner apical cell of each elytron with a distinct dark spot inside posterior angle, fig. 221; vertex usually with a pair of longitudinal broken stripes, figs. 345-347; usually a dark spot on margin of elytron in front of costal veinlets . . . . . **53. Palus**  
Without dark spot inside posterior angle of inner apical cell, although cell often margined with fuscous; head may be marked but without longitudinal stripes . . . . . 55
55. Appendix of each elytron very narrow and extending only slightly beyond posterior angle of inner apical cell, fig. 222; elytra usually broader at or near apex of each clavus . . . . . **52. Latulus**  
Appendix of each elytron broader and extending at least to middle of apical cell, as in fig. 227; elytra usually more slender and not broader near apex of each clavus . . . . . 56
56. Veins of elytra, especially in apical region and on each clavus, heavily and nearly uniformly margined with black or brown, fig. 227 . . . . . **57. Hebecephalus**  
Veins of elytra unmargined with black or brown, or only irregularly so . . . . . 57
57. Vertex bluntly angled and slightly convex, fig. 368 . . . . . **55. Deltoccephalus**  
Vertex generally more acutely angled, and flat or even a little depressed . . . . . 58
58. Male plates, figs. 378-385, decidedly larger than valve; female seventh sternite, fig. 386, notched, produced, or with teeth, not simple on posterior margin . . . . . **58. Laevicephalus**  
Male plates, figs. 387, 388, short, smaller than valve; female seventh sternite, fig. 236B, usually broadly and concavely rounded . . . . . **59. Psammotettix**
59. Appendix of each elytron extending broadly around entire apex, fig. 216 . . . . . 72  
Appendix, if present, not extending beyond middle of apex of elytron, as in fig. 230 . . . . . 60
60. Vertex short and broad, very little longer at middle than next to eyes, and less than one-half its width between eyes, fig. 206 . . . . . 61  
Vertex angulate, conspicuously longer at middle than next to eyes, and equal to or more than one-half its width between eyes, fig. 399 . . . . . 62
61. Color bright green; elytra with white areolar spots; vertex unmarked . . . . . **75. Opsius**

- Color more yellowish or dull green to brown; vertex with a transverse brown band, fig. 206.....76. **Limotettix**
62. Vertex longer than or equal in length to width between eyes, as in fig. 395....63  
Vertex distinctly shorter than width between eyes, as in fig. 397.....64
63. At least some of apical wing veins brown; head equal in width to or slightly narrower than pronotum, figs. 395, 396.....67. **Stirellus**  
Veins uniformly yellow or greenish; head distinctly wider than pronotum.....65. **Unerus**
64. Pronotum with a very distinct shiny black transverse band on basal half behind head, fig. 397.....63. **Amblysellus**  
Pronotum without distinct band, although often with faint to distinct transverse lines.....65
65. Color above uniformly pale green; vertex with four black spots, in addition to dark ocelli, close to front margin, fig. 391.....62. **Graminella**  
Color usually some shade of brown or straw yellow and sometimes with faint to distinct transverse bands or lines on vertex.....66
66. Vertex uniformly yellowish and with a narrow dark band behind front margin reaching from eye to eye, fig. 208.....60. **Amplicephalus**  
Vertex marked or unmarked but without narrow band behind front margin...67
67. Vertex and pronotum with irregular or sinuate transverse black to dark brown lines, fig. 409.....74. **Ophiola**  
Vertex and pronotum sometimes obscurely marked with darker spots but without transverse lines.....68
68. Vertex distinctly angled and twice as long at middle as length next to eyes, fig. 209; body slender, more than three times as long as wide; elytra covering abdomen.....77. **Thamnotettix**  
Vertex more bluntly angled and at middle, not more than one and three-fourths times length next to eyes, fig. 405; body usually broad, less than three times as long as wide; elytra often short, exposing apex of abdomen.....73. **Euscelis**
69. Vertex sharply angulate and much longer than width between eyes; each eye longer than distance between eyes, fig. 210; appendix of each elytron extending completely around apex.....66. **Gillettiella**  
Vertex usually more bluntly angulate to evenly rounded and never more than width between eyes, as in figs. 466, 472; appendix of each elytron not reaching beyond apical cell.....70
70. Vertex longer at middle than next to eyes, figs. 472-477.....71  
Vertex almost parallel margined, figs. 466-468.....100. **Davisonia**
71. Ovipositor greatly extending beyond pygofer; each male pygofer without notch or process on posterior margin.....71. **Athysanella**  
Ovipositor extending only to apex of each pygofer; male pygofer with notch or

- process on posterior margin, as in fig. 245B.....72
72. Each male pygofer faintly notched on posterior margin.....101. **Sonronius**  
Each male pygofer with a small finger-like process on posterior margin, fig. 245B.....102. **Macrosteles**

41. **SCAPHOIDEUS** Uhler

*Scaphoideus* Uhler (1889, p. 33).

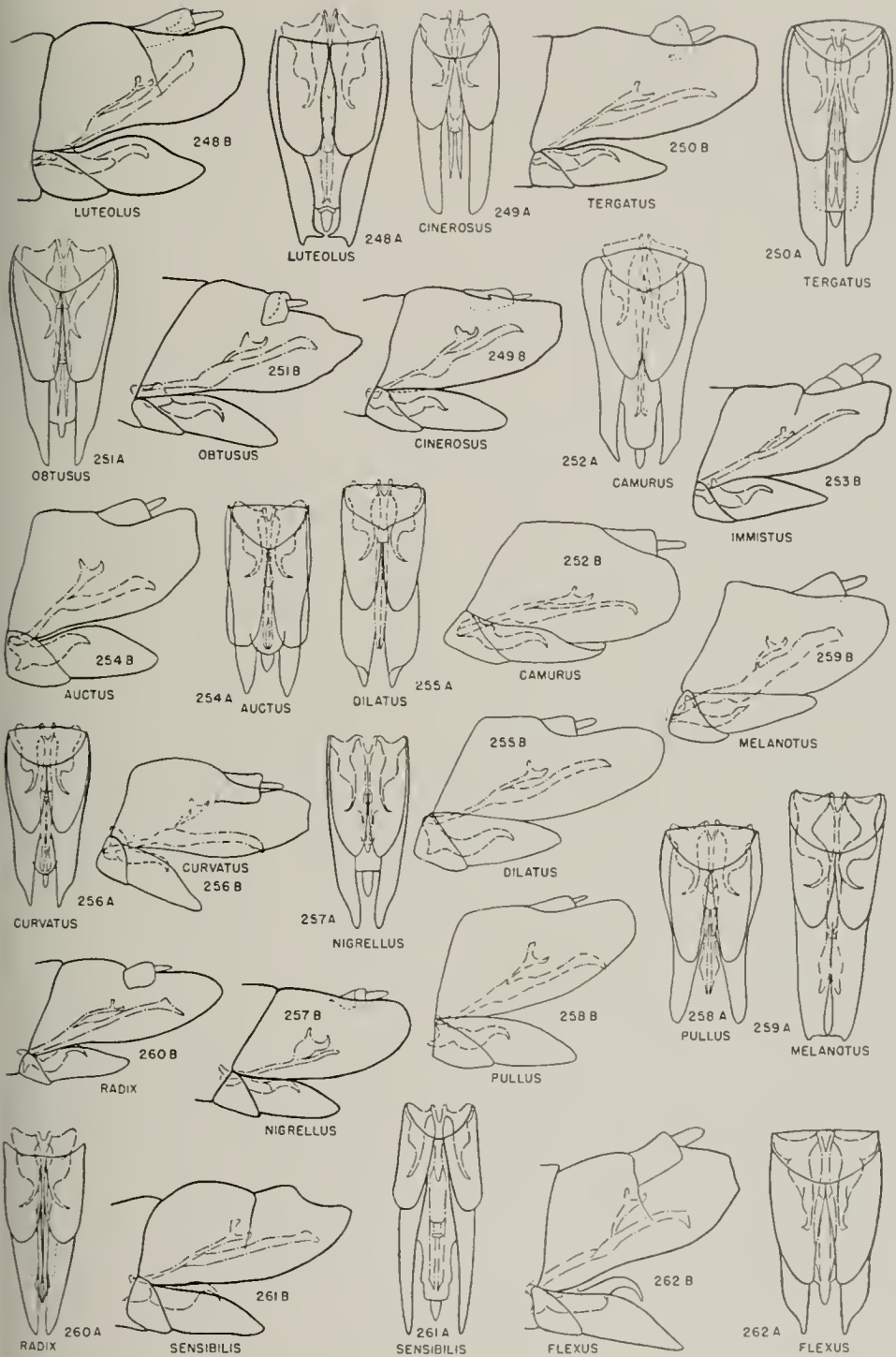
Fig. 228. Vertex produced, triangular, flat above, bluntly angled. Outer anteapical cell of each elytron oblique, the basal portion of which bears two or three oblique veinlets to costa. Practically all the species of the genus have rather conspicuous color markings. The commissural line is usually marked with a white stripe, which is variously broken by dark coloration and in most species forms a specific recognition color pattern.

Insofar as records go, the species of the genus seem to occur frequently upon rank growing herbaceous vegetation, such as *Solidago* and *Aster*, especially in open woodland and similar habitats.

DeLong (1939a) reviewed the species of *Scaphoideus* and recorded 46 species as occurring in the United States. Nearly all of these are found in the eastern United States, and 31 species are known from Illinois.

KEY TO SPECIES

1. Males.....2  
Females.....33
2. Usually small, narrow, length not exceeding 6 mm. Plates only slightly narrowed apically, apex broadly rounded, as in fig. 248.....3  
Usually larger, robust, length over 6 mm. Plates broad at bases, gradually narrowed to inner margins, apexes bluntly or sharply angled, as in fig. 271.....21
3. Dorsal process of aedeagus in lateral view with a long slender basal portion, bifurcate at apex, as in fig. 250; ventral portion usually much longer than dorsal.....4  
Dorsal process of aedeagus shorter, more inflated or bulbous, usually with a pair of small terminal processes, as in fig. 257; ventral portion shorter than or only slightly exceeding dorsal process.....17
4. Claval areas of elytra brown, almost unicolorous, without spots or pale areas, veins inconspicuous.....5  
Claval areas of elytra spotted or with pale areas, veins conspicuous.....6
5. Aedeagus, fig. 248, in lateral view broadened at apex and directed dorsally.....31. **luteolus**  
Aedeagus, fig. 250, narrower, pointed at



Figs. 248-262.—*Scaphoideus*, male genitalia; both internal and external structures shown. A, ventral aspect; B, lateral aspect.

- apex and curved slightly ventrally. . . . . 1. **tergatus**
6. Elytra transversely banded, milky white, faintly marked with brown almost to apex of each clavus; dark brownish band across apex of clavus; apices of elytra smoky. . . . . 29. **obtusus**  
Elytra not distinctly banded, entirely pale or mottled. . . . . 7
7. Elytra pale in color, veins dark; dorsal portion of aedeagus, fig. 249, with a median tooth between anterior and posterior terminal processes; ventral portion of aedeagus in lateral view broadened on apical half, apex curved ventrally and pointed. . . . . 23. **cinerosus**  
Elytra dark in color or with dark markings; dorsal portion of aedeagus without median apical tooth. . . . . 8
8. Ventral process of aedeagus narrow, tapered at apex, as in fig. 252. . . . . 9  
Ventral process of aedeagus broader, or enlarged at apex, or both, as in fig. 254. . . . . 10
9. Ventral aedeagus process, fig. 253, narrow throughout its length, apex gently curved ventrally. . . . . 27. **immistus**  
Ventral aedeagus process, fig. 252, enlarged at base of dorsal process, tapered to slender apex, which is strongly curved ventrally. . . . . 7. **camurus**
10. Face pale in color, often marked with dark arcs above. . . . . 11  
Face black or smoky, bordered with brown or black, dark arcs sometimes concealed by coloration, or arcs pale. . . . . 13
11. Aedeagus, fig. 254, enlarged just before bluntly pointed apex. . . . . 11. **auctus**  
Male aedeagus not enlarged at apex, as in fig. 255. . . . . 12
12. Pygofers truncate at apices; aedeagus, fig. 256, slightly curved downwardly at apex. . . . . 6. **curvatus**  
Pygofers rounded at apices; aedeagus, fig. 255, one-fourth longer, more narrowed at apex. . . . . 5. **dilatatus**
13. Face entirely black, except for a small white spot just below apex, arcs absent. . . . . 24. **melanotus**  
Face smoky to brown, with conspicuous arcs on upper portion. . . . . 14
14. Elytra rather uniformly dark in color; scutellum conspicuously pale, dark only in basal angles. . . . . 15  
Elytra with numerous pale markings or areas; scutellum with dark markings other than on basal angles. . . . . 16
15. Aedeagus, fig. 258, with ventral portion enlarged at junction of dorsal process and again at apex, the latter curved ventrally and bluntly pointed. . . . . 10. **pullus**  
Ventral portion of aedeagus, fig. 261, almost uniform in size throughout, slightly narrowed on upper surface just before apex, which is obliquely sloping to ventral blunt apex. . . . . 28. **sensibilis**
16. Pygofers blunt, broadly rounded; ventral portion of aedeagus, fig. 262, almost uniform in size throughout, apical portion curved ventrally, apex truncate, with a pointed ventral projection. . . . . 8. **flexus**  
Pygofers more elongate, bluntly pointed; ventral portion of aedeagus, fig. 260, narrowed on median half, apex obliquely sloping, with a pointed tooth on upper margin and an elongate, more acutely pointed ventral apex. . . . . 9. **radix**
17. Face black or dark brown, with pale arcs beneath margin of vertex; dorsal portion of aedeagus, fig. 257, constricted just before divergent apical processes. . . . . 14. **nigrellus**  
Face pale, often conspicuously yellow and with dark arcs. . . . . 18
18. Entire dorsal surface pale; veins dark, a few dark markings on elytra; apices of elytra brown or smoky. . . . . 30. **opalinus**  
Darker in color, brownish or heavily marked with brown. . . . . 19
19. Vertex and scutellum conspicuously light, faintly marked; elytra dark brown to black, white commissural spot on each elytron conspicuous; ventral portion of aedeagus, fig. 264, very short. . . . . 4. **scelestus**  
Vertex and scutellum darker or more heavily marked; commissural spot on each elytron not conspicuously white; ventral portion of aedeagus longer, as in fig. 275. . . . . 20
20. Ventral aedeagus process, fig. 275, not as long as dorsal process; apex of each pygofer rounded. . . . . 25. **littoralis**  
Ventral aedeagus process, fig. 265, longer than dorsal process; apex of each pygofer more pointed. . . . . 13. **diutius**
21. Orange yellow or orange red in color. . . . . 22  
Some shade of brown, marked with dark brown or black. . . . . 23
22. Length not over 5 mm.; vertex almost uniform orange yellow, without median transverse band; margin of vertex white, with a black marginal line above and another below. . . . . 12. **baculus**  
Length more than 6 mm.; vertex white to yellow, with an orange transverse band. . . . . 33. **ochraceus**
23. Pygofers unusually long, narrowed, and rather sharply pointed apically, as in fig. 273. . . . . 24  
Pygofers normally produced, rounded, or truncated. . . . . 25
24. Aedeagus, fig. 276, in ventral view with broad processes that bear large chelate-like structures at apices. . . . . 18. **chelus**  
Aedeagus, fig. 273, in ventral view with processes that taper to form long slender apically curved structures that cross each other. . . . . 16. **elongatus**
25. Aedeagus, fig. 270, in lateral view with basal portion decidedly wider than apical portion. . . . . 2. **frisoni**  
Aedeagus in lateral view with basal portion not wider than apical portion. . . . . 26
26. Apical processes of male aedeagus, fig. 267, in ventral view appearing flat, about the same width throughout, evenly curved, rather abruptly narrowed to pointed apices. . . . . 3. **merus**  
Apical processes of male aedeagus in ventral view unevenly curved or gradu-

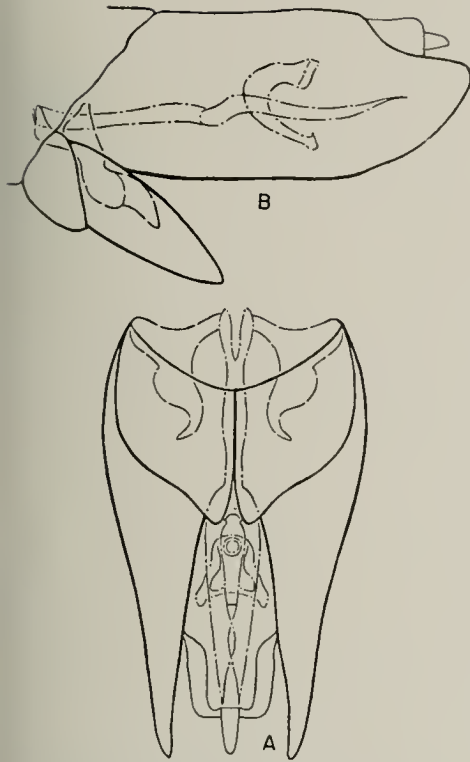
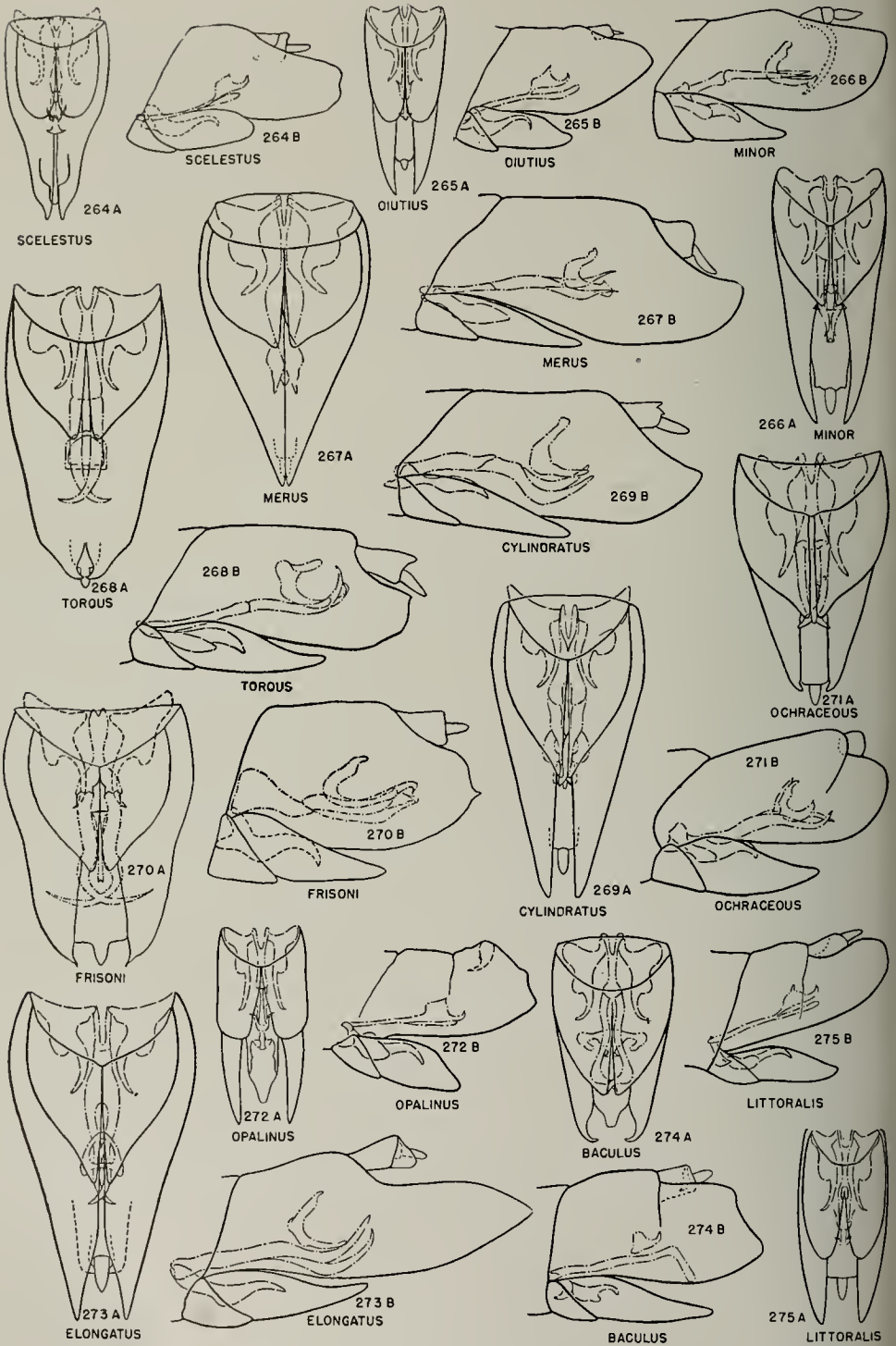


Fig. 263.—*Scaphoideus major*. A, ventral aspect, and, B, lateral aspect of male genitalia, both internal and external structures.

- ally tapered to more acutely pointed apex . . . . . 27
27. Apexes of ventral processes of aedeagus in ventral view long, slender, crossing each other, tips directed laterally, as in fig. 279 . . . . . 28
- Apexes of ventral processes of aedeagus usually blunt, or if acutely pointed they are directed caudad and not crossed at apexes, as in fig. 269 . . . . . 30
28. Vertex bluntly angled, almost rounded, heavily marked with black; transverse bands of vertex black . . . . . 22. **nigricans**
- Vertex more strongly produced, marked with brown; transverse band on vertex some shade of red or orange . . . . . 29
29. Aedeagus, fig. 278, widened near base in ventral view, gradually tapering to long slender apex . . . . . 19. **transeus**
- Basal two-thirds of aedeagus, fig. 268, about the same width in ventral view, apical third gradually tapering . . . . . 15. **torqus**
30. Aedeagus, fig. 269, with ventral processes in ventral aspect unevenly curved, apexes bluntly pointed; male plates long and narrow . . . . . 17. **cylindratus**
- Ventral processes of aedeagus rather evenly curved, apexes acutely pointed; male plates shorter and broader, as in fig. 266 . . . . . 31
31. Ventral processes of aedeagus enlarged on inner margins about one-third the distance from their apexes, outer margins straight, as in fig. 277 . . . . . 32
- Ventral processes of aedeagus, fig. 266, not enlarged between base and apex, apical fourth gradually narrowed and curved slightly inwardly to sharply pointed appressed apexes . . . . . 32. **minor**
32. Ventral portion of aedeagus, fig. 277, one-half longer than connectives; dorsal aedeagus process broad at base and with short thick apical portion, which is rounded at apex and bears a conspicuous dorsal spine . . . . . 20. **densus**
- Ventral portion of aedeagus, fig. 263, only slightly longer than connectives; dorsal aedeagus process semicircular and tapered to apex, which is blunt, slightly enlarged, and bears a small dorsal spine . . . . . 21. **major**
33. Vertex orange or with a bright orange transverse band . . . . . 34
- Vertex brown or marked with brown . . . . . 35
34. Face and vertex almost uniform orange . . . . . 12. **baculus**
- Vertex pale, with a bright orange transverse band; pronotum and scutellum mottled with orange . . . . . 33. **ochraceus**
35. Elytra appearing banded, each with anterior portion almost to tip of clavus white, posterior portion dark brown . . . . . 29. **obtusus**
- Elytra not appearing banded . . . . . 36
36. Elytra almost plain brown in color, each with a few pale markings . . . . . 37
- Elytra light in color, or each with numerous pale markings . . . . . 38
37. Elytra uniform brown, without dark markings . . . . . 31. **luteolus**
- Elytra brown, each with a few dark markings on clavus . . . . . 1. **tergatus**
38. General appearance light gray or white, with few dark markings . . . . . 39
- General appearance brown, mottled with white . . . . . 40
39. White, with dark veins and a few dark spots on elytra . . . . . 23. **cinerosus**
- White, elytra without dark veins and with a few pale spots . . . . . 30. **opalinus**
40. Face usually dark brown to black . . . . . 41
- Face usually pale, light brown, or dusky . . . . . 43
41. Vertex sharply pointed, heavily marked with black, and with a broad black band . . . . . 14. **nigrellus**
- Vertex more bluntly angled, marked with brown; transverse band brown or tawny . . . . . 42
42. Transverse band of vertex broad, brown in color . . . . . 6. **curvatus**
- Transverse band narrow, pale tawny in color . . . . . 24. **melanotus**
43. Transverse band on vertex usually narrow . . . . . 44
- Transverse band on vertex usually broad, often involving posterior half of vertex . . . . . 49
44. Face pale yellow; vertex, pronotum, and scutellum pale; narrow pale band on vertex . . . . . 4. **scelestus**

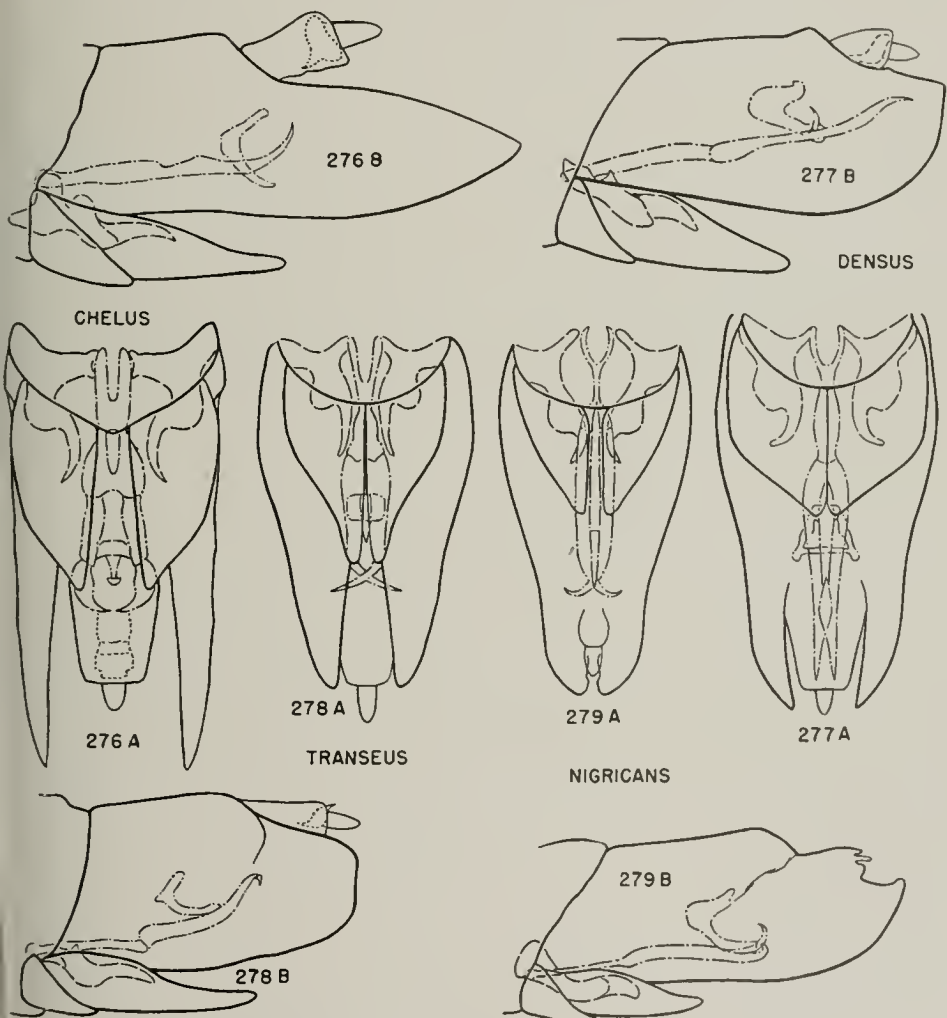


Figs. 264-275.—*Scaphoideus*, male genitalia; both internal and external structures shown. A, ventral aspect; B, lateral aspect.



- Face usually pale brown or dusky; pronotum or posterior portion of pronotum brown..... 45
45. Length not more than 5.5 mm..... 46
46. Length usually 6.0 mm. or more..... 48
46. Anterior half of pronotum usually pale; band on vertex tawny, appearing to lack a middle toothlike marking..... 10. *pullus*
- Pronotum usually brown; vertex band with a central toothlike marking... 47
47. Vertex band brown..... 9. *radix*
47. Vertex band tawny..... 11. *auctus*
48. Vertex short, almost rounded at apex, conspicuously marked with black..... 22. *nigricans*
- Vertex bluntly angled at apex
17. *cylindratus*, 18. *chelus*
49. Length 6.5 to 7.0 mm.; female seventh sternite produced and angled at middle, lateral angles absent... 26. *productus*

- Length smaller, or with lateral angles conspicuous..... 50
50. Marginal black line above apex of vertex heavy, usually broken at middle and intensified either side of break; line often reduced to spots..... 51
- Marginal line usually narrower, continuous at margin, not heavier at apex... 54
51. Length less than 6 mm..... 52
52. Length 6 mm. or more..... 53
52. Basal half of vertex usually brown; elytra heavily marked with brown..... 32. *minor*
- Basal half of vertex usually pale; elytra with lighter brown markings..... 19. *transeus*
53. Vertex sharp pointed, ends of broken marginal line usually reduced to spots at apex..... 15. *torqus*
- Vertex more bluntly angled, ends of broken marginal line usually reduced to spots



Figs. 276-279.—*Scaphoideus*, male genitalia. A, ventral aspect; B, lateral aspect.

- which often merge with projecting tooth on transverse band . . . . .
- ..... 21. *major*, 3. *merus*, 2. *frisoni*, 20. *densus*, 16. *elongatus*
54. Length not over 5.5 mm. . . . . 55  
 Length 5.5 mm. or more . . . . .
5. *dilatatus*, 7. *camurus*, 28. *sensibilis*
55. Toothlike mark on transverse band minute . . . . .  
 . . . . . 13. *diutius*, 27. *immistus*
- Toothlike mark on transverse band larger . . . . .  
 . . . . . 8. *flexus*, 25. *littoralis*

### 1. *Scaphoideus tergatus* DeLong

*Scaphoideus tergatus* DeLong (1939a, p. 45).

Length 5.5–6.0 mm. Similar to *luteolus*, but elytra more spotted with pale areas. Vertex white, with a very narrow marginal line, slightly interrupted at middle, and with a broad testaceous transverse band between anterior margins of eyes; band scarcely produced at middle. Pronotum testaceous, with a white transverse band on middle. Each elytron dark brown, with a few pale areas; veins on clavus indistinct, veins on corium and costa brown, apical portion black.

Female seventh sternite with apical third of posterior margin produced in a short broad rounded black tooth. Male aedeagus, fig. 250, in lateral view with ventral portion narrow, widened at junction of dorsal portion; apex gradually narrowed to pointed tip, which is slightly curved ventrally.

This species is known only from Illinois. A few specimens were taken in low floodplain woods in a very moist habitat.

**Illinois Records.**—JONESBORO: state forest, July 31, 1934, DeLong and Mohr, 1 ♂, 1 ♀. HAVANA: Aug. 30, 1917, 1 ♀.

### 2. *Scaphoideus frisoni* DeLong & Mohr

*Scaphoideus frisoni* DeLong & Mohr (1936, p. 975).

Length 6 mm. Vertex white, with dark line above front margin interrupted at middle and widened either side of apex. Transverse fuscous band with central portion produced, ends sloping anteriorly. Scutellum pale, basal angles darker. Elytra white, mottled with brown, veins and apex of each dark brown.

Female seventh sternite broadly and roundedly produced and slightly keeled at middle. Male plates about as long as combined basal width, convexly rounded on basal portion, concavely rounded to form blunt pointed apices. Aedeagus, fig. 270, with a pair of long processes arising near

base, in ventral view separated near base, almost contiguous near middle, then again separated and crossing each other so that the apical fourth of each is directed laterally and is slender and tapered at apex. A broad dorsal tooth on apex of each pygofer.

This species was found on herbaceous plants in woodland areas in northern Illinois. Its distribution in the United States is decidedly northern.

**Illinois Records.**—ANTIOCH: Aug. 24, 1935, DeLong & Ross, 1 ♀. PALOS PARK: Aug. 8, 1935, DeLong & Ross, 1 ♀.

### 3. *Scaphoideus merus* DeLong & Beery

*Scaphoideus merus* DeLong & Beery (1936, p. 336).

Length 6.5–7.0 mm. Resembling *carinatus* Osborn (1900a, p. 201) in size and general appearance but with distinctive male genitalia. Vertex strongly produced, apex bluntly angled, almost as long at middle as basal width between the eyes. Face pale, with two heavy dark bands below margin of vertex. Marginal line above vertex broken at middle and widened on either side of apex; median transverse band on vertex decidedly notched either side of central anterior produced portion, causing it to appear trilobate anteriorly. Pronotum and scutellum dark brown, mottled. Elytra white, washed with pale brown; veins, margins at apices, and a spot on center of each clavus dark brown.

Female seventh sternite with prominent lateral angles, posterior margin black, almost truncate, slightly emarginate either side of middle. Male plates short and broad, length equaling combined basal width, convexly rounded to form blunt apices. Styles, fig. 267, abruptly narrowed at two-thirds their length to form narrow processes that are bent strongly outward and produced. Aedeagus in ventral view with a pair of short broad flat processes arising near the base, curved so as to leave an opening between them at base, but overlapping at apices; dorsal process with the apical portion rather broad, rounded at apex, and with a dorsal pointed tooth.

This species has previously been recorded from the District of Columbia and Pennsylvania only.

**Illinois Records.**—JUSTICE: in woods, July 23, 1937, Mohr & Burks, 2 ♂. SEY-

MOUR: in woods, July 7, 1937, Mohr & Burks, 1 ♂. VOLO: in bog, Aug. 22, 1937, Burks & Ross, 1 ♂.

#### 4. *Scaphoideus scelestus* DeLong & Mohr

*Scaphoideus scelestus* DeLong & Mohr (1936, p. 974).

Length 5–6 mm. Superficially resembling *melanotus* in color. Face pale, with two complete dark lines and broken arcs on upper portion. Vertex, pronotum, and scutellum usually pale in color, transverse band between eyes narrow and pale. Elytra heavily infuscated with dark brown or black, anterior half of each appearing uniformly black without areoles; two milky white areoles on middle of each clavus, and a few in anteapical cells.

Female seventh sternite roundedly produced and black margined. Male plates broadly rounded at apices. Aedeagus, fig. 264, in lateral view with basal portion slender and straight; dorsal process arising near apex, with a point at base; apex with a long dorsally curved finger-like process on caudoapical extremity.

This species has been taken in small numbers from herbaceous vegetation in Illinois. It was described from Pennsylvania.

**Illinois Records.**—METROPOLIS: Aug. 16, 1891, Hart 1 ♂; Aug. 17, 1891, Shiga & Hart, 1 ♂.

#### 5. *Scaphoideus dilatus* DeLong & Mohr

*Scaphoideus dilatus* DeLong & Mohr (1936, p. 966).

Length 5.5–6.0 mm. Vertex pale, the transverse, orange-red band rather broad. Pronotum dark brown, scutellum paler. Elytra brownish, apex black, veins black; each clavus with two white very small areolar spots and three or four white spots in anteapical cells. Face pale brown, with one complete line below margin of vertex.

Female seventh sternite strongly and roundedly produced and broadly margined with black. Male plates with broadly rounded apices. Aedeagus in lateral view, fig. 255, gradually enlarged on apical third to a sharp pointed apex; dorsal process with two divergent processes at apex.

Described from Pennsylvania, this species is known from several localities in Illinois.

**Illinois Records.**—ANTIOCH: Aug. 24, 1935, DeLong & Ross, 5 ♀. MOMENCE: Aug.

22, 1934, DeLong & Ross, 1 ♂. VOLO: in bog, Aug. 24, 1935, DeLong & Ross, 3 ♂, 7 ♀. WHITE HEATH: June 4, 1939, J. C. Dirks, 2 ♂; July 31, 1939, J. C. Dirks, 2 specimens.

#### 6. *Scaphoideus curvatus* DeLong & Mohr

*Scaphoideus curvatus* DeLong & Mohr (1936, p. 967).

Length 5 mm. Vertex yellowish, marginal line conspicuous; median dark reddish brown transverse band between eyes rather broad and produced at middle. Pronotum dark brown, with a pale transverse band. Apical half of scutellum pale yellow. Elytra brown; veins dark brown, with very pale areas; two very small areoles near center of each clavus along commissural line.

Female seventh sternite produced, rounded at apex, and black margined. Male plates broadly rounded at apices. Aedeagus in lateral view, fig. 256, narrowed at about half its length, then produced, and ventrally curved at apex, tip pointed; dorsal process arising from enlarged portion, broadened apically and bifurcate.

This species was described from specimens taken in southern Illinois.

**Illinois Record.**—NEW HAVEN, June 23, 1936, DeLong & Ross, 1 ♂, 1 ♀.

#### 7. *Scaphoideus camurus* DeLong & Mohr

*Scaphoideus camurus* DeLong & Mohr (1936, p. 967).

Length 5.5–6.0 mm. Vertex white, with a rather narrow tawny band between eyes, band slightly produced at middle. Pronotum dark, with a pale transverse band behind eyes. Elytra pale brown, veins darker, intensity of dark markings variable, with dark markings usually on apical portions at least. Face yellow, with at least two complete dark lines below margin of vertex.

Female seventh sternite slightly rounded, produced, and black margined. Male plates broadly rounded apically. Aedeagus in lateral view, fig. 252, tapered toward apex, where it is sharply bent ventrally and pointed; dorsal process enlarged at apex; anterior apical process very small, almost wanting.

This species was described from Illinois and Pennsylvania. It has been taken in small numbers in low swampy wooded areas from herbaceous vegetation.

Illinois Record.—KARNAK: June 14, 1934, DeLong & Ross, 6 ♂.

### 8. *Scaphoideus flexus* DeLong & Mohr

*Scaphoideus flexus* DeLong & Mohr (1936, p. 968).

Length 5.0–5.5 mm. Vertex white, with a rather broad tawny band between the eyes, band scarcely produced anteriorly. Pronotum tawny, with paler transverse band on disc. Elytra brownish, marked with darker brown and with veins darker brown. Face tawny, with dark arcs on upper portion; narrow dark line just beneath margin of vertex, below which is a white band.

Female seventh sternite with prominent angles, posterior margin concavely and roundedly produced either side of a dark margined centrally produced lobe. Male plates with blunt rounded apices. Aedeagus in lateral view, fig. 262, with apical half gradually bending ventrally, apex enlarged, truncate, with a ventrally pointed tooth on ventral margin; dorsal process bifurcate at apex and concavely rounded between tips.

Recorded from Pennsylvania, Tennessee, and Illinois, *flexus* occurs on herbaceous vegetation in woodland areas.

Illinois Records.—Many males and females, taken June 14 to September 27, are from Apple River Canyon State Park, Ashley, Dolson, Dubois, Elizabethtown, Grafton, Herod, Jonesboro, Kampsville, Kankakee, Marshall, Rock Island, Shawneetown, Urbana, Vienna, Volo, and White Heath.

### 9. *Scaphoideus radix* DeLong & Mohr

*Scaphoideus radix* DeLong & Mohr (1936, p. 969).

Length 4.5–5.0 mm. Vertex pale, with a fine sinuate marginal line and a narrow conspicuous transverse band between anterior margins of eyes, band slightly produced at middle and bordered with reddish brown on its posterior margin. Pronotum dark brown, black behind either eye, a white cross band on anterior portion of disc. Elytra pale, mottled with brown, veins brown; each elytron with a large brown spot at apex of first claval vein and a large spot on disc. Face pale, dusky on either side next to eyes.

Female seventh sternite with posterior margin slightly concave on either side of a

central broadly produced lobe, which is blunt at apex and slightly bifid. Male plates with apices broadly rounded. Aedeagus, fig. 260, slender on apical half to near apex, which is enlarged into a foot-shaped structure with the long pointed toe portion extending ventrally; dorsal portion with bifurcate process.

Described from Illinois, this species was found only in open woodland in the southern portion of the state.

Illinois Records.—DIXON SPRINGS: July 9, 1935, DeLong & Ross, 1 ♀. ELIZABETHTOWN: May 22–24, 1932, Ross, Dozier, & Park, 1 ♀. HORSESHOE LAKE: on cypress, July 11, 1935, DeLong & Ross, 1 ♀. KARNAK: July 10, 1935, DeLong & Ross, 1 ♀.

### 10. *Scaphoideus pullus* DeLong & Mohr

*Scaphoideus pullus* DeLong & Mohr (1936, p. 969).

Length 4.5–5.5 mm. Vertex pale yellow, with a narrow black marginal line and a narrow transverse reddish band between eyes. Pronotum paler at middle, sides darker. Elytra pale brown, heavily infuscated, and with a few pale whitish areas; each clavus appearing to have a much darker stripe along inner margin, with two paler spots on posterior half. Face pale brown, with arcs always conspicuous above.

Female seventh sternite produced and rounded. Male plates with broadly rounded apices. Aedeagus in lateral view, fig. 258, enlarged on apical fourth, curved ventrally near apex, the apex bluntly pointed on ventral side.

Known previously from the District of Columbia, Pennsylvania, and Wisconsin, this species is found also in several localities in the southern half of Illinois, and occurs in open woodland.

Illinois Records.—Males and females, collected June 9 to August 24, are from Dozier, Dubois, Eichorn, Golconda, Hardin, Karnak, Metropolis, Monticello, New Holland, and St. Joseph.

### 11. *Scaphoideus auctus* DeLong & Mohr

*Scaphoideus auctus* DeLong & Mohr (1936, p. 970).

Length 5 mm. Vertex pale, transverse band orange, a pale transverse band on anterior portion of pronotum and scutellum.

Elytra gray, heavily marked with dark brown or black, veins conspicuously dark. Face yellowish, with one complete dark line below margin of vertex.

Female seventh sternite strongly and roundedly produced, apex faintly notched. Male plates rounded at apexes. Aedeagus in lateral view, fig. 254, enlarged at apex and obliquely sloping to form a caudoventrally directed and bluntly pointed apex; dorsal process short and broad, the concave apex forming two short thick divergent processes.

This is a rather uncommon species and occurs in Illinois in woodland areas on herbaceous vegetation. It is also known from Wisconsin and Pennsylvania.

**Illinois Records.**—NEW HAVEN: June 23, 1936, DeLong & Ross, 1 ♂. URBANA: July 1, 1889, Marten, 1 ♂; June 27, 1889, Hart, 1 ♂; July 7, 1889, Hart 1 ♂.

## 12. *Scaphoideus baculus* DeLong & Mohr

*Scaphoideus baculus* DeLong & Mohr (1936, p. 970).

Length 4.5–5.0 mm. Tawny, almost devoid of white areolar spots. Face tawny, margin of vertex white, with a black marginal line above and two conspicuous black lines below. Vertex with tawny band so broad it covers surface almost entirely but leaves a narrow anterior pale area and a broad V-shaped posterior pale area. Pronotum usually darker than vertex, with traces of a white cross band just back of eyes. Elytra tawny, almost lacking white areolar spots, veins brown; each elytron with brown spots at apex, also at apex of first claval vein, and at apex of clavus.

Female seventh sternite with posterior margin concavely and roundedly produced to form a pair of prominent black teeth separated by a V-shaped notch. Male plates narrowed to inner margins, each bluntly angled. Aedeagus, fig. 274, with apical portion fourth bent sharply ventrally; apical portion sometimes uniform in width and sometimes tapered to apex.

The food plant of *baculus* is not known. This species has been collected in several Illinois areas. It has been recorded from Pennsylvania and Ohio, as well as Illinois.

**Illinois Records.**—ALTON: July 19, 1932, Ross & Dozier, 1 ♂. DOLSON: July 24, 1936, DeLong & Mohr, 1 ♂. DUBOIS:

sweeping along railroad, July 9, 1909, 1 ♀. URBANA: tree trunk, July 23, 1917, 1 ♂; tree trunk, Aug. 4, 1916, 1 ♀; Aug. 8, 1916, 1 ♀; Aug. 9, 1920, Malloch, 1 ♀; Aug. 12, 1935, Burks, 1 ♂; at light, Aug. 13, 1935, H. H. Ross, 1 ♂; tree trunk, Aug. 28, 1917, 7 ♂, 4 ♀; dredge ditch, Aug. 30, 1914, 1 ♀; forestry, Sept. 3, 1916, 1 ♀.

## 13. *Scaphoideus diutius* DeLong & Mohr

*Scaphoideus diutius* DeLong & Mohr (1936, p. 972).

Length 5 mm. Resembling *immistus* in color. Vertex pale, transverse band broad, tawny, scarcely produced at middle. Face yellow. Pronotum with a rather faint transverse band back of eyes. Elytra pale, tinged with brown, veins dark brown.

Female seventh sternite with posterior margin roundedly produced and black margined. Male plates with apexes broadly rounded. Aedeagus in lateral view, fig. 265, similar to that of *littoralis* but with the apical ventral processes longer than the dorsal process and the dorsal process with a more slender curved finger-like projection on posterior margin.

This species was taken in small numbers in the northern portion of Illinois in open woodland. It is known also from Pennsylvania.

**Illinois Record.**—STARVED ROCK STATE PARK: July 14, 1932, Dozier & Park, 2 ♂, 1 ♀.

## 14. *Scaphoideus nigrellus* DeLong & Mohr

*Scaphoideus nigrellus* DeLong & Mohr (1936, p. 973).

Length 4.5–5.0 mm. Black, resembling *sensibilis* in appearance. Vertex white, with a broad black transverse band between eyes, band strongly produced anteriorly and shading to brown posteriorly. Pronotum black, with an interrupted white transverse band behind eyes. Elytra brownish, heavily marked with black and with a few white areolar spots, two spots on each clavus along commissural line usually conspicuous. Venter black, face black, with three pale arcs extending up over margin of vertex.

Female seventh sternite roundedly produced. Male plates slightly narrowed to broadly rounded apices. Aedeagus in lateral

view, fig. 260, with a long slender basal portion, and a bulblike portion arising at about half its length; apical end broad, concavely excavated, the outer margins with projecting points.

Recorded only from Illinois, this is a rather abundant species in the low flood-plain woodland valleys of southern Illinois on a species of *Solidago*.

**Illinois Records.**—DANVILLE: Aug. 17, 1934, DeLong & Ross, 2 ♀. DOLSON: Rocky Branch, July 18, 1934, DeLong & Ross, 3 ♂, 4 ♀; July 24, 1936, DeLong & Mohr, 15 ♂, 46 ♀. URBANA: Sept. 10, 1934, H. H. Ross, 1 ♀. WILMINGTON: Aug. 20, 1934, DeLong & Ross, 1 ♂.

15. *Scaphoideus torqus* DeLong & Beery

*Scaphoideus torqus* DeLong & Beery (1936, p. 337).

Length 6.5 mm. Vertex pale, transverse band on disc rather narrow and slightly produced anteriorly at middle. Pronotum and scutellum tawny. Elytra pale, each darker on posterior half; veins brown. Face pale brownish. Marginal line above vertex narrow, interrupted, the line below margin entire, heavy.

Male plates tapered to bluntly pointed apices. Aedeagus in ventral view, fig. 268, composed of two portions that are separated at base but curve inwardly and then cross anterior to the laterally directed apices; apical portion of dorsal process not bearing a dorsal tooth. Upper apical portion of each pygofer with a distinct tooth. The female is unknown.

Described from Pennsylvania, this species has also been taken in northern Illinois in a woodland area.

**Illinois Record.**—GRAND DETOUR: Castle Rock, July 2, 1932, Dozier & Mohr, 1 ♂.

16. *Scaphoideus elongatus* DeLong & Beery

*Scaphoideus elongatus* DeLong & Beery (1936, p. 337).

Length 6.5–7.0 mm. Vertex with median transverse tawny band narrow, strongly produced anteriorly at middle. Pronotum and scutellum brownish, mottled with white, apical half of scutellum paler. Elytra white, veins dark brown, fuscous blotches on each

elytron forming an indefinite oblique band from anterior claval area to median costal area. Face pale, slightly smoky; a slender black line just beneath margin of vertex, the one above a little broader on either side of median line, where it is broken.

Female seventh sternite almost truncate, slightly produced and slightly and concavely rounded at middle. Male plates gradually narrowed to pointed apices. Aedeagus in ventral view, fig. 273, composed of a pair of processes that taper to pointed apices, which overlap; these curved and contiguous at middle, then separated anterior to and posterior to this point. Pygofers long and pointed.

This species has been found in Virginia, Mississippi, and Illinois.

**Illinois Record.**—STARVED ROCK STATE PARK: July 14, 1932, Dozier & Park, 1 ♂.

17. *Scaphoideus cylindratus* DeLong & Beery

*Scaphoideus cylindratus* DeLong & Beery (1936, p. 338).

Length 6.0–6.5 mm. Vertex pale, transverse band narrow, pale orange in color, and slightly produced at middle. Pronotum uniform brown; scutellum paler, with darker basal angles. Elytra rather uniform dull brown, each with veins and apex darker but almost devoid of areolar spots. Face pale brown, with two contiguous lines beneath vertex margin; line above margin slightly broken at middle.

Female seventh sternite broadly and roundedly produced and black margined on central half. Male plates convexly rounded and tapered to pointed apices. Aedeagus in ventral view, fig. 269, composed of a pair of rather short broad cylindrical processes, each bluntly pointed and slightly curved upward at apex.

This species has been taken in several New England states and in Illinois.

**Illinois Record.**—URBANA: on cottonwood, July 12, 1920, Auden, 1 ♂.

18. *Scaphoideus chelus* DeLong & Beery

*Scaphoideus chelus* DeLong & Beery (1936, p. 339).

Length 6–7 mm. Vertex pale, with a rather broad and poorly defined tawny transverse band between eyes. Pronotum

and scutellum brown, the former with a paler indistinct band. Elytra brownish, veins dark brown. Face slightly tawny, a dark line just below vertex and a slender one above, the latter broken at middle.

Female seventh sternite with posterior margin slightly produced to form a median rounded lobe, which is slightly emarginate at apex. Male plates convexly rounded to blunt apices. Aedeagus in ventral view, fig. 276, with a pair of separated processes arising from basal portion; these extend caudally and bear at their apices a pair of broad, curved, pincer-like processes that taper to sharp-pointed proximal apices. Pygofers long, sharply pointed.

This species has been taken only in the southern portion of the state in open woodland on dense herbaceous vegetation. It was described from Illinois.

**Illinois Record.**—DOLSON: Rocky Branch, July 18, 1934, DeLong & Ross, 1♂, 1♀.

#### 19. *Scaphoideus transesus* DeLong & Beery

*Scaphoideus transesus* DeLong & Beery (1936, p. 339).

Length 5.5 mm. Vertex white, transverse median band orange at sides, darker and produced anteriorly at middle. Pronotum and scutellum pale brown. Elytral veins, and spot on costa at middle, dark brown. Face pale, a narrow black line beneath the margin of vertex and a broader one ventrad to this; marginal line on vertex broken at middle and broadened on either side of apex.

Female seventh sternite with posterior margin slightly produced, median fourth with a rather broad shallow notch. Male plates narrowed from near base to form long pointed tips with blunt apices. Aedeagus in ventral view, fig. 278, composed of a pair of processes that are broad and proximal at base and diverge to apices of plates, where they bend inwardly, cross each other, and taper to long pointed apices.

This species is known to occur in a habitat very similar to that of *chelus* and has been taken in central and northern Illinois. It is also known from Iowa and the District of Columbia.

**Illinois Records.**—DOLSON: Rocky Branch, July 18, 1934, DeLong & Ross, 1♂,

1♀. GALENA: hillside pasture, July 10, 1934, DeLong & Ross, 1♂.

#### 20. *Scaphoideus densus* DeLong & Beery

*Scaphoideus densus* DeLong & Beery (1936, p. 340).

Length 6.0–6.5 mm. Vertex pale, with broken marginal line, transverse tawny band narrow, obliquely sloping to margin on either side, and strongly produced at middle. Pronotum and scutellum brownish. Elytra white, washed with pale brown, each with a spot on anterior part; clavus and apex of each elytron dark brown. Face pale, with three dark lines on upper portion.

Female seventh sternite slightly produced, rounded, and black margined. Male plates with apical halves sloping to bluntly pointed apices. Aedeagus, fig. 277, more than one-third longer than connective, two branched, each arm broadened on inner margin one-third the distance from apex and tapered to a sharply pointed tip; in lateral view the aedeagus is broadened near apex, curved, and tapered to pointed tip; dorsal process bearing a dorsal spine on apical portion.

Recorded from Ohio, Quebec, and Illinois, this species has been taken at several localities in this state in open woodlands. It is closely related to *chelus*.

**Illinois Records.**—BLUFF SPRINGS: June 10, 1932, Ross & Mohr, 1♂. EICHORN: Hicks Branch, June 13, 1934, DeLong & Ross, 1♂. ELIZABETHTOWN: May 27–31, 1931, Dozier, 1♀; June 25, 1932, Ross, Dozier, & Park, 2♂, 1♀.

#### 21. *Scaphoideus major* Osborn

*Scaphoideus immistus* var. *major* Osborn (1900a, p. 205).

Length 6.0–6.5 mm. Vertex strongly produced, bluntly angled, almost as long at middle as basal width between eyes; a brown band just below ocelli, and another just above, broken at middle; transverse band tawny, notched on either side of a broad median tooth, which extends almost to marginal band. Elytra long, broadly rounded at apex; subhyaline, with dark veins, apical margins brownish.

Female seventh sternite slightly produced and slightly but broadly notched at middle; faintly concave on either side of median third. Male plates not quite as long as

combined basal width, strongly and convexly rounded to bluntly pointed apices. Styles, fig. 263, tapered from base, each strongly and suddenly narrowed on outer margin to form on the apical fifth a short outwardly curved finger-like process. Aedeagus about the length of the connective, two branched, each branch in ventral view appearing broadened on inner margin about one-third the distance from apex and tapered to pointed tip; in lateral view aedeagus appearing tapered to a long attenuated pointed apex; dorsal process semicircular, tapered to apex, which is blunt, slightly enlarged, and with a very small dorsal spine.

This species was described from Iowa.

**Illinois Records.**—ALTON: June 26–27, 1934, DeLong & Ross, 2♂. APPLE RIVER CANYON STATE PARK: July 11, 1934, DeLong & Ross, 1♂. URBANA: Aug. 5, 1889, Hart, 1♀; Aug. 28, 1890, Hart & Shiga, 2♀; Aug. 10, 1891, Hart & McElfresh, 2♀; Aug. 29, 1891, 1♀.

## 22. *Scaphoideus nigricans* Osborn

*Scaphoideus nigricans* Osborn (1911, p. 258).

Length 6.0–6.5 mm. Vertex broad, white, marginal band interrupted at middle; median transverse band dark brown, narrow, sinuate, produced anteriorly at middle, forming a broad tooth, and curved posteriorly on either side. Pronotum pale anteriorly, darker posteriorly. Elytra white, veins reflexed, costal veinlets and spots in several cells brown. Face pale, smoky above, a heavy black line beneath vertex margin.

Female seventh sternite angularly produced. Male plates tapered from bases to bluntly pointed apices. Aedeagus, fig. 279, two branched, processes long, curved inwardly, crossed near apex and tapered to pointed tips; in lateral view the processes curve upward and anteriorly.

Recorded first from North Carolina and Tennessee, this species has since been taken at two localities in central Illinois.

**Illinois Records.**—URBANA: cottonwood, July 12, 1920, F. K. Auden, 1♀. WHITE HEATH: June 4, 1939, J. C. Dirks, 1♀.

## 23. *Scaphoideus cinerosus* Osborn

*Scaphoideus cinerosus* Osborn (1900a, p. 208).

Length 4.0–4.5 mm. Ashy gray, with faint marking. Vertex almost white, with

a faint brownish cross band between the eyes, and a very faint marginal line. Pronotum light gray, with brownish spots on posterior portion. Elytra with veins brown, and pale brownish spots on discal, inner anteapical, and apical cells.

Female seventh sternite roundedly produced. Male plates broadly rounded at apices. Aedeagus in lateral view, fig. 249, enlarged at about one-half its length, then constricted; apical third broadened, apex curved on dorsal portion to a ventrally sharp-pointed tip; dorsal process enlarged at apex, with anterior and posterior processes and a median sunken tooth.

This species has been taken in small numbers in Illinois in woodland areas. It is known also from Iowa.

**Illinois Records.**—URBANA: June 7, 1889, C. A. Hart, 1♂; Aug. 18, 1892, C. A. Hart, 4♀; June 23, 1918, 1♂; cottonwood, June 12, 1920, C. P. A., 1♀; Aug. 9, 1920, J. R. Malloch, 1♀; Aug. 15, 1940, 1♂.

## 24. *Scaphoideus melanotus* Osborn

*Scaphoideus melanotus* Osborn (1900a, p. 206).

Length 5 mm. Pale brown, with a black face having one minute white point just below apex of vertex and one on tip of clypeus. Vertex whitish, with a rather faint narrow brownish band, darker at center; marginal line narrow. Pronotum whitish, with anterior and posterior fulvous bands. Elytra with whitish marginal lobes on each clavus and spots on costal and post-nodal cells, fig. 228. Fulvus and fuscous markings as in *immistus*, to which this species is rather closely related.

Female seventh sternite roundedly produced and medially notched. Male plates with broadly rounded apices. Aedeagus in lateral view, fig. 259, broad, apex broadly and bluntly rounded; dorsal process with two short apical divergent processes. Pygofer each with a pair of spines at base, spines large and turned upward.

An inhabitant of herbaceous vegetation in wooded areas, this species is known from the eastern United States and occurs as far west as Texas. Recorded eastern localities include Maryland, Pennsylvania, and Tennessee. The species is rare in Illinois.

**Illinois Records.**—DOLSON: Rocky Branch, July 18, 1934, DeLong & Ross, 1♀. SPRINGFIELD: Sept. 25, 1934, H. H. Ross, 1♀.



### 25. *Scaphoideus littoralis* Ball

*Scaphoideus littoralis* Ball (1932, p. 15).  
*Scaphoideus brevidens* DeLong & Mohr (1936, p. 971).

Length 4.75–5.5 mm. Pale tawny, vertex pale, with black marginal line and transverse band behind middle tawny. Elytra opalescent, each with an apical smoky band extending to a point just before the cross nervures; nervures rusty brown; two lobate ivory spots on the commissure, and with oval spots on the claval sutures. Face pale smoky in the female, creamy in the male.

Female seventh sternite with the posterior margin roundedly produced. Male plates with rounded apices. Aedeagus in lateral view, fig. 275, with a long slender ventral process, which is bifid on apical third, the bifurcate processes not as long as the dorsal portion of the aedeagus; dorsal process broadened at apex, which is concavely rounded between a small anterior toothlike projection and a posterior finger-shaped process, the latter curving dorsally and anteriorly.

One of the most common species of the genus, *littoralis* is found abundantly throughout Illinois. It is widely distributed in the eastern states and ranges west to South Dakota.

**Illinois Records.**—Many males and females, taken May 29 to October 1, are from Adair, Algonquin, Alton, Antioch, Apple River Canyon State Park, Cedar Lake, Centralia, Champaign, Charleston, Dixon Springs, Dolson, Dubois, Elizabethtown, Fox Lake, Galena, Golconda, Grafton, Hardin, Harrisburg, Havana, Herod, Kampsville, Kankakee, Karnak, La Rue, Mahomet, Meredosia, Metropolis, Mount Carmel, Muncie, Normal, Oak Lawn, Olive Branch, Palos Park, Parker, Quincy, Rockton, Rosiclare, Springfield, Thebes, Urbana, Vienna, Volo, Wauconda, West Union, White Heath, and Zion.

### 26. *Scaphoideus productus* Osborn

*Scaphoideus productus* Osborn (1900a, p. 200).

Length 6 mm. Female heavily marked and with a strongly produced seventh sternite. Vertex yellowish, with a broad fuscous band between eyes, this band produced at middle almost far enough to meet marginal band. Pronotum yellowish, with lateral fuscous areas. Elytra whitish, with fulvous

blotches on discal and apical cells, and fuscous patches on each clavus, inner discal cell, and costal crossvein and apical vein.

Female seventh sternite produced at center and strongly keeled. The first sex of this species to be described was the male, but the type male cannot be located, and the sexes have not been associated.

This species occurs in Iowa, is widely distributed over the eastern states, and undoubtedly will be found in Illinois.

### 27. *Scaphoideus immistus* (Say)

*Jassus immistus* Say (1831, p. 306).

Length 4.75–5.5 mm. Vertex blunt, white, with a prominent black rounded marginal line; transverse band broad, dark, strongly produced at middle to form a blunt tooth, band shading to fuscous and usually covering most of the basal portion. Pronotum brown, usually with a broken pale band anterior to middle; an apical and a median lateral spot on each side white. Elytra fuscous, veins darker, apex of each elytron black; several areolar spots present. Face smoky, darker above.

Female seventh sternite roundedly produced, black margined, forming a somewhat produced lobe at center. Male plates with broadly rounded apices. Aedeagus in lateral view, fig. 253, long and slender, slightly curving ventrally, and pointed at apex; dorsal process with bifurcate processes at apex, the latter short, truncate, and divergent.

This is one of the two most common species of the genus and has been taken in considerable numbers throughout the state. It occurs abundantly in the eastern United States and ranges south and west to Texas and California.

**Illinois Records.**—Many males and females, taken June 14 to October 2, are from Algonquin, Cave in Rock, Champaign, Dubois, Fairfield, Fountain Bluff, Harrisburg, Havana, Henry, Herod, Justice, Karnak, Kinnundy, Meredosia, Metropolis, Mount Carmel, New Haven, Newton, Oakwood, Quincy, Rosiclare, Seymour, Shawneetown, Sumner, Urbana, Vienna, Volo, and White Heath.

### 28. *Scaphoideus sensibilis* Ball

*Scaphoideus sensibilis* Ball (1932, p. 14).

Length 5–6 mm. Black, marked with ivory white. Vertex ivory white, with sub-

marginal dark line; median transverse band dark brown or black, band narrow next to eyes, widened at middle, and with an acute median projection. Scutellum with a large median shield of ivory and a pair of large black spots just inside the basal angles. Elytra heavily clouded with dark brown or black, with two lobate median ivory spots and four pairs along the suture on each clavus; a hyaline spot on costa.

Female seventh sternite with posterior margin angularly produced, lateral margins of produced portion concave. Male plates long and narrow, apices bluntly rounded. Aedeagus in lateral view, fig. 261, long with apex enlarged, obliquely sloping, bluntly pointed on ventral margin.

This species was described from Florida, and a few specimens have been taken in Illinois.

**Illinois Record.**—JONESBORO: July 31, 1934, DeLong & Mohr, 1 ♂, 2 ♀.

### 29. *Scaphoideus obtusus* Osborn

*Scaphoideus obtusus* Osborn (1900a, p. 207).

Length 5 mm. Pale, with the basal half of each elytron appearing gray, the posterior portion darker. Vertex white, with a broad fuscous band between eyes; band produced anteriorly and posteriorly at middle. Pronotum fuscous, with a median longitudinal stripe and posterior margin white. Elytra white to pale gray, the basal half of each with a few dark markings, a heavy black band across posterior portion extending cephalad to apex of clavus, giving the insect a banded appearance. Face smoky.

Female seventh sternite roundedly produced and broadly black margined. Male plates long, broadly rounded at apices. Aedeagus in lateral view, fig. 251, enlarged at one-third its length, then narrowed and produced to apex, which is enlarged, curved on dorsal surface, and forms a pointed tip on ventral margin; dorsal process bifurcate, posterior process longer than anterior process.

This species, found in small numbers in woodland habitats in Illinois, is known also from Florida, New York, and Iowa.

**Illinois Records.**—ELMIRA: Aug. 2-3, 1883, 1 ♂. THOMASBORO: July 20, 1914, 1 ♀. URBANA: on cottonwood, July 12, 1920, F. K. Auden, 2 ♂, 2 ♀; Aug. 13, 1920, 1 ♀.

### 30. *Scaphoideus opalinus* Osborn

*Scaphoideus opalinus* Osborn (1905b, p. 525).

Length 5.0-5.5 mm. Grayish brown, with an opalescent tint. Vertex white to gray, marginal line distinct, fuscous bands between eyes faint, often broken at middle and broadest next to eyes. Pronotum pale brownish, disc dull gray. Scutellum mostly white, basal angles fuscous. Elytra fuscous, opalescent, a pair of brownish spots on commissure at apex of each claval vein, between which are two rounded white or gray lobate spots; a large hyaline area on middle of each costa; apical and antepical reflexed costal veinlets and apex black. Face pale smoky.

Female seventh sternite slightly and roundedly produced, almost truncate. Male plates narrowed, but broadly rounded. Aedeagus, fig. 272, with ventral bifurcate apical process short, not as long as dorsal portion; dorsal process abruptly enlarged at apex and lacking an anterior process at tip but with a well-developed finger-like posterior process.

This species has been found occasionally upon *Juniperus* through the southern half of the state. It has been taken also in immature stages from this plant. Previous records show its occurrence in Florida, New Jersey, and New York.

**Illinois Records.**—DIXON SPRINGS: July 9, 1935, DeLong & Ross, 2 ♂, 2 ♀. HILLSBORO: on juniper, June 26, 1934, DeLong & Ross, 7 ♂, 1 ♀. LAWRENCEVILLE: on juniper, Sept. 24, 1932, Frison & Mohr, 1 ♀. STARVED ROCK STATE PARK: July 14, 1932, Dozier & Park, 1 ♂.

### 31. *Scaphoideus luteolus* Van Duzee

*Scaphoideus luteolus* Van Duzee (1894b, p. 210).

Length 4.0-4.5 mm. Brownish, elytra with a few pale areas. Vertex white, marginal line heavy. Fuscous band between eyes broad, width almost half the length of vertex, medially produced. Pronotum almost uniformly brownish. Scutellum brownish fuscous anteriorly, paler posteriorly. Elytra brownish fuscous, veins brown, reflexed costal veinlets, apex of each elytron, and apical veins brownish; small white areolar spots just before and also posterior to cross nervures of apical cells.

Female seventh sternite roundedly pro-

duced, with a short V-shaped notch at apex. Male plates broadly rounded at apexes. Aedeagus in lateral view, fig. 248, broadened at one-third its length, somewhat narrowed at two-thirds its length, and again broadened to enlarged apex, which is produced dorsally and bluntly pointed; dorsal process slender, with two long slender bifurcate teeth.

Taken in small numbers in herbaceous woodland habitats, this species has been recorded only from the Middle West.

**Illinois Records.**—ALTON: June 26, 1934, DeLong & Ross, 1♂, 1♀. ASHLEY: Aug. 17, 1917, 1♂. CEDAR LAKE: in bog, Aug. 6, 1906, 1♂. HAVANA: July 2, 1934, DeLong & Ross, 1♀. MEREDOSIA: Aug. 20, 1917, 1♂. MONTICELLO: June 11, 1934, Frison & DeLong, 1♀. PANA: July 21, 1937, Mohr & Burks, 1♂. URBANA: on cottonwood, July 12, 1920, F. K. Auden, 1♂; Aug. 11, 1932, H. H. Knight, 1♀.

### 32. *Scaphoideus minor* Osborn

*Scaphoideus immistus* var. *minor* Osborn (1900a, p. 205).

*Scaphoideus immistus* var. *incisus* Osborn (1900a, p. 206).

Length 4.25–5.0 mm. Vertex more obtuse than in *immistus*, white to yellow, with a conspicuous marginal line and a tawny transverse band produced at middle, forming a blunt tooth. Pronotum brown, a transverse narrow white band at middle. Elytra fuscous, veins brown, marked with numerous brown spots and white areoles; apex of each elytron black margined. Face pale, with dark lines below vertex margin.

Female seventh sternite broadly and roundedly produced. Male plates convexly rounded to bluntly pointed apexes. Aedeagus in ventral view, fig. 266, with a pair of slender processes arising at base and separated for most of their length, curved inwardly, meeting at their apexes, which are sharp pointed and curved slightly outward.

Although described from Iowa as a variety of *immistus*, this species is of the form and general type of *major* but with entirely different characters. It is found in Illinois in woodland habitats.

**Illinois Records.**—Males and females, taken May 18 to October 1, are from Alton, Dolson, Golconda, Hardin, Harrisburg, Havana, Kampsville, Karnak, Meredosia, Monticello, New Holland, Pike, Urbana, Vienna, Volo, White Heath, and Zion.

### 33. *Scaphoideus ochraceus* Osborn

*Scaphoideus ochraceus* Osborn (1898, p. 242).

Length 5–6 mm. Vertex white to yellow, with a conspicuous dark marginal line; transverse band broad, ochraceous, produced forward at middle on anterior margin and indented on posterior margin. Pronotum mostly ochraceous, with a broken transverse median pale band. Elytra tawny ochraceous, veins mostly brown, with several white areoles and brown spots. Face pale yellowish.

Female seventh sternite angularly produced. Male plates tapered from near base to bluntly pointed apexes. Aedeagus in ventral view, fig. 271, with a pair of short slender processes that are separated at base, curved on apical portions, and cross each other just before apexes, the latter narrow and bluntly pointed.

A woodland species usually found in small numbers, *ochraceus* occurs in the eastern United States.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, Frison & DeLong, 1♀. DOLSON: Rocky Branch, July 18, 1934, DeLong & Ross, 3♂. PALOS PARK: Aug. 8, 1935, DeLong & Ross, 1♀.

### 42. *LONENUS* DeLong

*Loncnus* DeLong (1939a, p. 33).

The vertex is flat and similar in general appearance to that of *Scaphoideus*. The venation also is similar to that of *Scaphoideus*. The male plates are long and rather narrow. The long narrow apical portion of each style is longer than the basal portion. The characters of the dorsal portion of the aedeagus distinguish *intricatus*, the only known species in the genus, from all species in the related genus, *Scaphoideus*.

#### 1. *Loncnus intricatus* (Uhler)

*Scaphoideus intricatus* Uhler (1889, p. 34).

Length 5.5–6.0 mm. White, with anterior portion of the elytra dark. Vertex white, with a conspicuous but interrupted marginal line; transverse band pale, broken, often with central portion wanting. Pronotum white, transverse; tawny band on posterior portion faint and broken. Scutellum white. Elytra with a large oblique dark brown area on basal half of each extending posteriorly to central anteapical cell and

extending into middle of clavus; veins on apical portion, reflexed veinlets and apical margin brown. Face white, a black spot below each ocellus, and black lines below vertex margin.

Female seventh sternite roundedly produced and black margined. Male plates, fig. 246, long, convexly curved from bases, apexes bluntly pointed. Apical half of styles forming long, slender, straight processes. Aedeagus in ventral view, fig. 246, with a pair of long slender processes arising at base, curving divergently at base and crossing each other before apexes; apexes slender.

The only species in the genus, *intricatus* is distributed rather commonly throughout the eastern half of the United States. In Illinois, it is known only from the northern half of the state.

**Illinois Records.**—ANTIOCH: Aug. 24, 1935, DeLong & Ross, 1 ♀. APPLE RIVER CANYON STATE PARK: Aug. 22, 1935, DeLong & Ross, 1 ♂, 1 ♀. DONGOLA: Aug. 23, 1916, 1 ♀. HAVANA: Aug. 31, 1917, 1 ♀. NORTHERN ILLINOIS: 1 ♀. PALOS PARK: Aug. 8, 1935, DeLong & Ross, 1 ♀. URBANA: July 21, 1889, Hart, 1 ♀; July 29, 1934, T. H. Frison, 5 ♀; Aug. 12, 1934, T. H. Frison, 1 ♂, 4 ♀; at light, Aug. 3, 1936, H. H. Ross, 1 ♀. WARREN: Aug. 22, 1935, DeLong & Ross, 1 ♂, 1 ♀.

### 43. OSBORNELLUS Ball

*Osbornellus* Ball (1932, p. 17).

Head slightly narrower than pronotum. Vertex flat, angled in front, and forming an acute angle with face. Male plates elongate, forming filamentous processes.

The species of this genus live for the most part upon herbaceous plants in open and wooded areas. Thirty species of *Osbornellus* have been recorded for the United States; six are known to occur in Illinois and at least one other may eventually be found here.

#### KEY TO SPECIES

1. Vertex marked with orange or orange red ..... 2  
Vertex brown, not marked with orange or orange red ..... 5
- \*2. Vertex with a transverse orange-red band ..... 3  
Vertex with two longitudinal orange spots or stripes ..... 1. **jucundus**
3. Female seventh sternite with a median notch or excavation; length of each male plate to base of attenuated portion

one-third greater than widest portion, as in fig. 286 ..... 4

- Female seventh sternite without notch; length of each male plate to attenuated portion scarcely greater than widest portion, fig. 281 ..... 3. **rotundus**
4. Female seventh sternite with a deep narrow median notch; apical portion of each male style, fig. 285, with straight margin not notched, and without teeth ..... 2. **auronitens**

Female seventh sternite roundedly produced either side of a broad shallow median excavation at the apex of which is a brownish longitudinal spot or a slight incision; apical portion of each male style, fig. 286, bearing a short pointed tooth on inner margin just before apex ..... 4. **limosus**

5. Vertex brown, concolorous ..... 5. **unicolor**  
Vertex not concolorous, marked with paler spots or lines ..... 6
6. Vertex dull yellow to brown, darker markings inconspicuous; median dark band between ocelli wanting ..... 6. **consors**  
Vertex white or pale, brown markings conspicuous; median darker band between ocelli conspicuous ..... 7. **clarus**

#### 1. *Osbornellus jucundus* (Uhler)

*Scaphoideus jucundus* Uhler (1889, p. 34).

Length 5.0–6.25 mm. Tawny yellow, elytra with numerous milky white spots. Vertex marked by two longitudinal orange spots. A narrow black line just above margin of vertex and a more distinct one on upper margin of face. Female seventh sternite with posterior margin broadly and convexly rounded. Male plates slender, narrowed to long attenuate apexes. Aedeagus, fig. 282, curved ventrally, narrowed to apex, where a pair of divergent apical processes arise, curve laterally and cephalad.

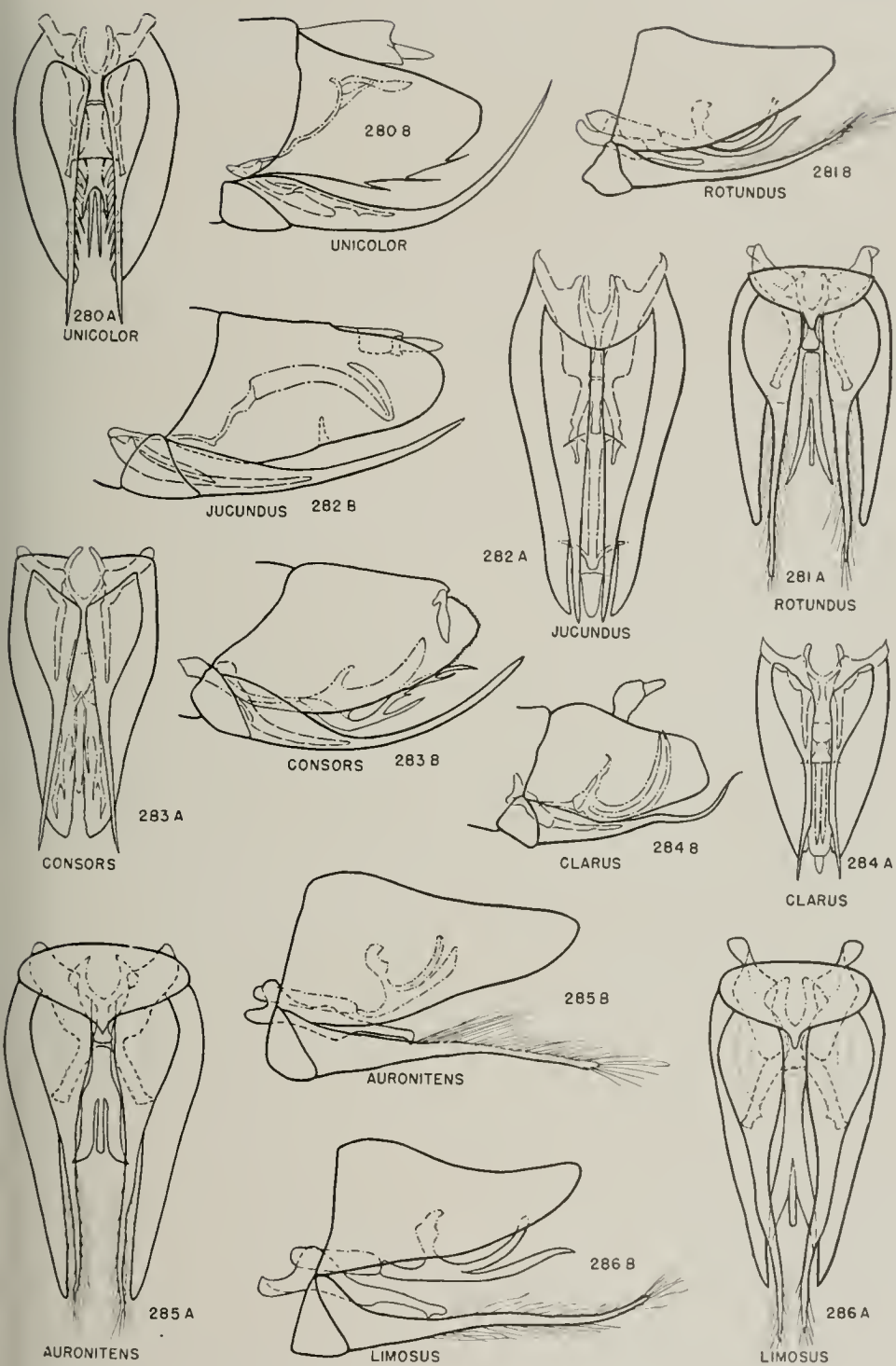
Occurring in small numbers in woodland areas on herbaceous vegetation, *jucundus* is distributed over the eastern United States and west to Missouri and Iowa.

**Illinois Records.**—ALTON: June 26, 1934, 1 ♂. ANVIL ROCK: Oct. 3, 1934, Frison & Ross, 1 ♀. HAVANA: Aug. 30, 1917, 2 ♂. HEROD: Aug. 4, 1934, DeLong & Mohr, 1 ♀. OREGON: Aug. 23, 1935, DeLong & Ross, 1 ♀. PALOS PARK: Aug. 8, 1935, DeLong & Ross, 1 ♂. TAMAROA: Sept. 22, 1882, 1 ♂ (Acc. No. 3135).

#### 2. *Osbornellus auronitens* (Provancher)

*Scaphoideus auronitens* Provancher (1889, p. 277).

Length 6 mm. Light yellow, and with a prominent orange-red transverse band; ver-



Figs. 280-286.—*Osbornellus*, male genitalia; both internal and external structures shown. A, ventral aspect; B, lateral aspect.

tex anteriorly margined with a black line; a black band on margin of vertex and another just above margin. Pronotum marked with reddish. Elytra each with three reflexed costal veinlets and three pairs of black spots along claval suture.

Female seventh sternite cleft to near its base, forming two broadly rounded lobes. Male plates elongate, triangular, with long attenuated apices. Styles with apical portion of each bent outwardly, almost parallel margined. Aedeagus in lateral view, fig. 285, curved dorsally and with a pair of broad processes arising laterally just before base of shaft, flaring slightly, apices pointed.

This is the most common species of the genus in Illinois and has been taken abundantly throughout the state. It is found in the eastern United States only.

**Illinois Records.**—Many males and females, collected from June 14 to November 17, are from Antioch, Apple River Canyon State Park, Bloomington, Channel Lake, Dixon Springs, Dolson, Elizabethtown, Fox Lake, Grand Tower, Herod, Hopedale, Kankakee, Makanda, Marshall, Monticello, Mount Carmel, Muncie, Oakwood, Temple Hill, Urbana, Vienna, and White Heath.

### 3. *Osbornellus rotundus* Beamer

*Osbornellus rotundus* Beamer (1937, p. 93).

Length 5.0–5.5 mm. Tawny and of the same form, color, and appearance as *auronitens*, but with the female seventh sternite not cleft and vertex more acute. Vertex with three dark parallel lines and a transverse orange-red band between eyes. Pronotum with the anterior margin orange and with darker spots posteriorly. Each clavus with three dark spots on commissural suture.

Female seventh sternite with posterior margin truncate or slightly produced. Male plates long, acutely tapered, with long filamentous apices. Each style with apical half narrowed, tapering to slightly knobbed tip. Aedeagus, fig. 281, long and slender, a pair of lateral processes arising a short distance from the base and gradually tapering to sharp apices.

For many years this species has been confused with *auronitens*, which it closely resembles. It occurs on herbaceous vegetation in open woodlands, and it is widely distributed over the eastern United States.

**Illinois Records.**—DOLSON: Rocky Branch, July 18, 1934, DeLong & Ross,

2 ♀. GRAFTON: on wild grape, July 2, 1932, Frison & Ross, 1 ♂.

### 4. *Osbornellus limosus* DeLong

*Osbornellus limosus* DeLong (1941, p. 179).

Length 5–6 mm. Resembling *auronitens* in form and general appearance but with vertex more broadened and with distinctive male and female genitalia. Vertex almost one-third wider between eyes than median length. In color similar to *auronitens*, with broad orange-red transverse band on vertex and with orange-red blotches on pronotum and basal angles of scutellum. Elytra pale brown, with veins dark brown and three pairs of brown spots along commissural line of each clavus as in *auronitens*.

Female seventh sternite with posterior margin roundedly produced on either side of a broad shallow median excavation, with a brownish longitudinal spot or slight incision at apex. Male valve, fig. 286, roundedly produced, with a median produced pointed apical tooth. Plates long and tapered to acute tips. Each style with outer margin notched just beyond middle, forming a long narrow apical finger-like process that is bent outwardly from notched portion; each style bears a short pointed tooth on inner margin just before apex. Aedeagus with a short rather broad process extending dorsally near base; apical portion consisting of a single curved dorsal process and a ventral process that is bifurcate at about its middle, forming a pair of divergent processes, which are broad at base but tapered to slender pointed apices.

This species has been recorded from New Jersey, Pennsylvania, and northern Tennessee, and may eventually be found in the southern portion of Illinois.

### 5. *Osbornellus unicolor* (Osborn)

*Scaphoideus consors* var. *unicolor* Osborn (1900a, p. 196).

Length 5 mm. Face, vertex, and pronotum uniform brown, elytra brownish hyaline, nervures dark; reflexed costal veins and apices broadly fuscous. Female seventh sternite with posterior margin almost truncate, often with an indication of a slight central tooth, on either side of which the segment is emarginate. Each male plate narrow, twice as long to attenuation as greatest width. Styles with truncate apices.

Aedeagus, fig. 280, composed of a short ventral and a longer dorsal process, each of which is bifid. Ventral margin of each pygofer with long slender caudally directed spines.

A common species on herbaecous vegetation in open woodland, *unicolor* has been recorded from the eastern United States and Texas.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, DeLong & Ross, 1♂. ELIZABETHTOWN: July 8, 1935, DeLong & Ross, 1♂.

#### 6. *Osbornellus consors* (Uhler)

*Scaphoideus consors* Uhler (1889, p. 36).

Length 5.5–6.0 mm. Brownish, marked with fuscous and yellowish. Lines and markings on vertex blending with and not much darker than ground color. Pronotum with a pale spot behind each eye and a pale median longitudinal line. Elytra subhyaline, pale spots on each clavus indistinct, nervures brown, apical margin and costal veinlets broadly black.

Female seventh sternite with posterior margin sinuate. Each male plate long, tip attenuate. Each style with apical two-thirds slender, straight, and tapered. Aedeagus, fig. 283, with a rather heavy body and with a pair of antler-like structures having many lateral processes arising near base and extending beyond apex of body of aedeagus.

This is a common species on herbaecous vegetation in wooded areas. Distributed through the eastern United States, it ranges west to Texas, Colorado, and Utah.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, Frison & DeLong, 4♂, 5♀. DIXON SPRINGS: July 29, 1934, DeLong & Mohr, 1♂. DOLSON: Rocky Branch, July 18, 1934, DeLong & Ross, 12♂, 3♀. FERN CLIFF: Aug. 3, 1934, DeLong & Mohr, 1♀. KANKAKEE: July 20, 1934, DeLong & Ross, 1♂. MARSHALL: Sept. 27, 1934, Frison & Ross, 1♀. NORTHERN ILLINOIS: 2♀. PALOS PARK: Aug. 8, 1935, DeLong & Ross, 3♂, 1♀. WHITE PINES FOREST STATE PARK: Aug. 27, 1934, DeLong & Frison, 1♀.

#### 7. *Osbornellus clarus* Beamer

*Osbornellus clarus* Beamer (1937, p. 99).

Length 5.0–5.5 mm. Closely resembling *consors* but more distinctly marked and

without the branched aedeagus processes. Vertex with distinct white apex; margin and a median triangle just behind apex conspicuously white, these markings bordered by heavy fuscous lines; a rather definite darker area forming a banded pigmentation between the eyes. Scutellum pale, with dark basal angles. Elytra cinereous, with dark veins.

Female seventh sternite roundedly produced. Each male plate with a long slender attenuated apex. Each style with apical half slender and tapered. Aedeagus, fig. 284, with a pair of long slender curved processes arising ventrally and curving dorsally.

This species occurs on herbaecous plants in open woodland. Specimens of this species, collected in the eastern United States, have for many years been listed under the name *scalaris* Van Duzee; *scalaris* is a species distributed only in the southwestern United States.

**Illinois Record.**—DUNCANS MILLS: near Spoon River, Oct. 20, 1941, 1♀.

#### 44. *PRESCOTTIA* Ball

*Prescottia* Ball (1932, p. 16).

Fig. 215. Head narrower than pronotum; vertex angular, broad and flat or concave, with a sharp margin acutely angled with front. Elytra each with outer anteapical cell, fig. 215, parallel with the costa; about four or five reflexed veinlets to costa and an equal number along costal area; cells anterior to the apical ones more or less reticulate, especially along claval suture.

Two described species belong to this genus, one of which occurs in the eastern United States and has been collected in Illinois.

##### I. *Prescottia lobata* (Van Duzee)

*Scaphoideus lobatus* Van Duzee (1894b, pp. 199, 211).

Length 5.5–6.0 mm. Pale yellow or white, marked with black lines and spots. Vertex yellowish, with a brown line above and parallel to margin, and a transverse brown line between eyes enlarged to a spot on disc. Elytra milky white, nervures broadly brown or black and with numerous heavy and large blackish blotches or inscribed lines; brown markings on each clavus heavy, forming three distinct white lobes along commissural line on inner margin. Female seventh ster-

nite with posterior margin almost truncate, slightly notched. Male plates, fig. 293, narrow, with slender recurved tips.

This species occurs in open woods or at woodland margins upon *Solidago caesia* and probably other species of plants. Collecting would indicate it is quite restricted in regard to its food plants.

**Illinois Records.**—STARVED ROCK STATE PARK: July 14, 1932, Dozier & Park, 1♂. ZION: July 25, 1934, Frison & DeLong, 1♂; Aug. 7, 1936, DeLong & Ross, 1♂.

#### 45. *SANCTANUS* Ball

*Sanctanus* Ball (1932, p. 10).

Front margin of vertex round to bluntly angled, disc slightly convex, meeting front in an acute angle. Elytra each with two cross nervures between the first and second sectors; central antepical cell constricted and divided; outer antepical cell usually narrow at both ends, and usually having one or more reflexed veinlets to the costa as well as extra reticulations in some cells. Most species are marked by pigmented saddle patterns.

Ten species of this genus are recorded for the United States by Oman (1934) and DeLong & Knull (1945). Eight of these occur in the eastern states, and one of them has been taken in Illinois.

##### 1. *Sanctanus sanctus* (Say)

*Jassus sanctus* Say (1831, p. 307).

*Scaphoideus picturatus* Osborn (1898, p. 243).

Length 4–5 mm. White, with a brownish band across elytra. Vertex rather sharply angled, white with two minute fuscous spots near apex. Pronotum with disc somewhat fuscous. Elytra white, each with a cruciform brownish band bordered with black; band covering posterior two-thirds of each clavus, a small round white spot at middle of band on commissural line. Female seventh sternite slightly notched at middle of posterior margin. Male plates, fig. 289, rather long and slender, longer than combined basal width; apex blunt.

This species occurs commonly in the southern fifth of the state on herbaceous plants. It is one of the most conspicuously marked of the Illinois species of leafhoppers.

**Illinois Records.**—Males and females, taken June 29 to October 6, are from Cache,

Carmi, Dubois, Elizabethtown, Meredosia, Metropolis, Olive Branch, Quincy, Rosiclare, and Thebes.

#### 46. *PLATYMETOPIUS* Burmeister

*Platymetopius* Burmeister (1838, pl. 14).

Head narrow, face plain, supernumerary veinlets short and at right angles to costa. Each elytron has only one cross nervure between the sectors. The species of this genus are without vermiculate markings.

Two species are at present included in this genus for the United States and one of these occurs in Illinois. The other, *palliolatus*, is found in Texas.

#### KEY TO SPECIES

Color orange yellow, with white areolar spots ..... 1. *vitellinus*  
 Color lemon yellow; pronotum and scutellum dark brown; a narrow brown stripe on each elytron along margin of scutellum and extending along suture to apex..... 2. *palliolatus*

##### 1. *Platymetopius vitellinus* (Fitch)

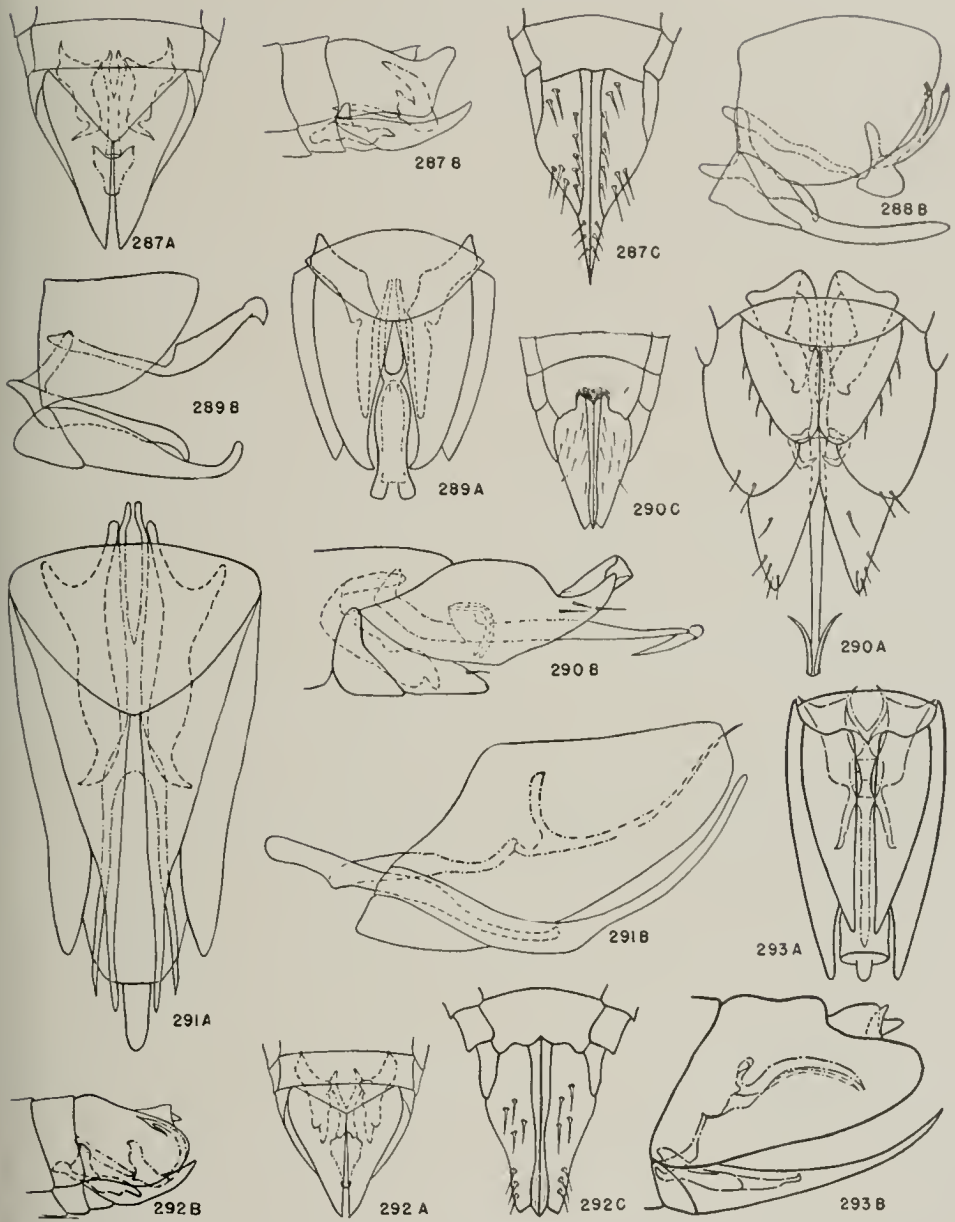
*Acocephalus vitellinus* Fitch (1851, p. 57).

Fig. 298. Length 5.5–6.5 mm. Orange yellow, with an oblique testaceous stripe on each elytron. Vertex and face pale yellow, usually a narrow black line just below margin of vertex. Pronotum yellow anteriorly, darker posteriorly. Scutellum pale yellow, the basal angles darker. Elytra yellow, with many white spots, each with a testaceous band at base, and another testaceous oblique band parallel to it from costa to apex of clavus. Female seventh sternite, fig. 296, with the posterior margin shallowly emarginate and with a narrow blunt tooth arising from the middle, the tooth longer than its basal width and bifid at apex. Male plates, fig. 297, convexly rounded, then narrowed to acute apex.

This species occurs on herbaceous vegetation in shrubby or open woodland areas. It has been taken from wild rose, but this may not represent a definite host plant. It is transcontinental in distribution.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, DeLong & Ross, 1♀. BEACH: July 25, 1934, Frison & DeLong, 1♀. FREEPORT: June 27, 1935, DeLong & Ross, 1♂. GALENA: July 10, 1934, DeLong & Ross, 1♀. GRAND DETOUR: July 12, 1934, DeLong & Ross, 1♀.





Athysaninae, male and female genitalia. The figures illustrate chiefly some generic characters. A, ventral aspect of male genitalia, both internal and external structures; B, lateral aspect of male genitalia, both internal and external structures; C, female genitalia, external structures only. Internal structures indicated by broken lines.

Fig. 287.—*Exitianus obscurinervis*.

Fig. 288.—*Opsius stactogalus*.

Fig. 289.—*Sanctanus sanctus*.

Fig. 290.—*Acurhinus pyrops*.

Fig. 291.—*Japananus hyalinus*.

Fig. 292.—*Remadosus magnus*.

Fig. 293.—*Prescottia lobata*.

OAKWOOD: June 18, 1926, Frison & Hayes, 1 ♂. WAUKEGAN: May 14, 1930, Frison & Ross, 2 ♀.

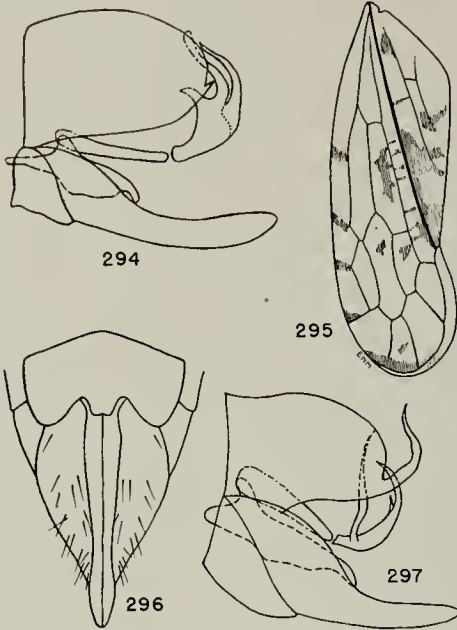


Fig. 294.—*Mesamia nigridorsum*, lateral aspect of male genitalia.

Fig. 295.—*Mesamia nigridorsum*, elytron.

Fig. 296.—*Platymetopius vitellinus*, female genitalia.

Fig. 297.—*Platymetopius vitellinus*, lateral aspect of male genitalia.

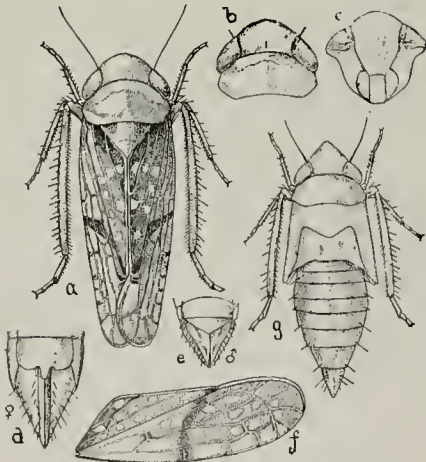


Fig. 298.—*Platymetopius vitellinus*: a, adult; b, head and pronotum; c, face; d, female genitalia; e, male genitalia; f, elytron; g, nymph. (From Osborn.)

## 2. *Platymetopius palliolatus* (Ball)

*Eutettix palliolata* Ball (1902a, p. 13).

Length 5–6 mm. Pale lemon yellow, tinged with greenish or brown. Pronotum, scutellum, and a narrow sutural stripe extending to apex of elytra dark brown; anterior portions of stripes often narrowly margined with white; brown stripe often contains smaller white spots. Face pale yellow, straight in lateral view. Vertex rather strongly produced and bluntly angled, about one and one-half times as wide between eyes at base as median length. Vertex flat, with a sharp margin.

Female seventh sternite truncate posteriorly, with a median produced blunt tooth notched at apex, tooth occupying the median fourth of segment and half as long as basal width. Male plates rather long, apices bluntly rounded. Styles gradually tapering from bases to blunt apices. Each pygofer with a spine arising ventrally at about the middle on either side and extending beyond apex. Aedeagus short, rather broad at base, narrowed to bifid apex, curved dorsally, then anteriorly.

This species is known only from Texas.

## 47. *JAPANANUS* Ball

*Japananus* Ball (1931c, p. 218).

Fig. 211. This genus is described as similar to *Platymetopius* in having the single cross nerve and the vermiculate markings. Vertex rather long and acute; elytra each with few or no veinlets to the costa. The latter character is probably the best one to use in separating it from the closely allied genera.

The only species known in this genus is an Oriental importation and occurs commonly upon maples in Illinois. Thus far in the United States, it is known to occur in the eastern part only.

### 1. *Japananus hyalinus* (Osborn)

*Platymetopius hyalinus* Osborn (1900d, p. 501).

Length of male 4.5 mm., female 5.5 mm. Face bright yellow, vertex, pronotum, and scutellum gray to green, tinged with bright yellow and smoky, often with pale longitudinal stripes on middle and from disc of vertex to eyes. Elytra hyaline, veins dark, a narrow, broken band of brownish spots

across anterior portion of each clavus, another across apex, and a third crossing apical portion of each elytron at apical crossveins.

Vertex in female more than twice as long as basal width between the eyes, deeply furrowed longitudinally. Male with vertex more blunt, about one and one-half times as long as basal width between the eyes, disc deeply depressed. Pronotum short and broad in both sexes, more than twice as wide as median length, eyes extending over anterior margin rather deeply on each side.

Female seventh sternite concavely produced for more than twice its length on posterior margin to form a long broad pointed tooth reaching two-thirds the length of pygofers. Male plate, fig. 291, long, triangular on basal half, then narrowed to form narrow attenuate tip, which is produced about the length of the basal half.

Illinois Records.—ALTON: July 19-21, 1932, Ross & Dozier, 11 ♂, 13 ♀; June 27, 1934, DeLong & Ross, 4 ♂. JACKSONVILLE: Aug. 23, 1943, 1 ♂, 1 ♀. MONTICELLO: Sept. 22, 1934, H. H. Ross, 1 ♀. OAK LAWN: in lamp globe, Aug. 22, 1934, 1 ♀. URBANA: Aug. 10, 1932, H. H. Ross, 3 ♀; Aug. 10, 1932, H. H. Knight, 1 ♂, 1 ♀; Sept. 7, 1934, Ross & Townsend, 3 ♂, 1 ♀; Aug. 28, 1934, Ross & Townsend, 3 ♀.

48. *SCAPHYTOPIUS* Ball

*Scaphytopius* Ball (1931c, p. 218).

Vertex flat, eyes large, deeply set into pronotum. Pronotum broader than head, venation regular, with two crossveins. Male genitalia with a single heavy portion that is bifid at apex.

Only one species, *elegans*, with three varieties, is known to occur in the United States. It is recorded from California, Arizona, and Florida.

1. *Scaphytopius elegans* (Van Duzee)

*Platymetopius elegans* Van Duzee (1890c, p. 94).

Length 4.5-5.0 mm. Pale brown, vertex margined with black anteriorly, a narrow pale median stripe at apex merging with a broad pale yellowish longitudinal stripe that extends from near apex of vertex across pronotum, scutellum, and each clavus of elytra to apex of clavus; stripe includes entire scutellum. Elytra brownish subhyaline, costal veins brown. Face dull yellow,

with a brown line above, leaving a narrow pale marginal band between the two parallel dark lines. Vertex blunt at apex, almost twice as long at middle as basal width between eyes at base.

Female seventh sternite rather broadly and roundedly produced on posterior margin. Male styles, fig. 241, with short thick apical processes that are curved outwardly. Aedeagus short and rather broad, with a pair of rather heavy divergent finger-like processes at apex.

This species is known only from Florida, Arizona, and California.

49. *CLOANTHANUS* Ball

*Cloanthanus* Ball (1931c, p. 219).

Fig. 299. Vertex flat, acutely angled, longer than basal width between eyes. Gena visible behind eyes. Pronotum broader than head. Elytral venation regular, two cross nervures between sectors, and numerous short reflexed veinlets to costa. Male genitalia with a dorsal portion and a pair of long ventral processes.

This genus includes almost all of the eastern species formerly placed under *Platymetopius*. DeLong (1943, 1945) and Hepner (1946) record about 85 species and subspecies as occurring in the United States. Thirteen species have been taken in Illinois, and several more may occur here.

The structures of the male genitalia present the most reliable characters for distinguishing the species of this genus. The color characters will aid in the identification of females of some species, but they are not entirely reliable.

KEY TO SPECIES

- 1. Males..... 2
- Females..... 30
- 2. Long ventral paired processes of aedeagus slender to apexes, often coiled, curved, or branched but not broadened near apexes, as in fig. 300..... 3
- Ventral paired processes each broadened or blade-like just before apex, often bearing a dorsal spine, as in fig. 312..... 15
- 3. Paired processes coiled around dorsal portion of aedeagus, as in fig. 301..... 4
- Paired processes extending toward caudal portion of pygofers, usually crossing each other and sometimes crossed over dorsal aedeagus portion but not coiled around it, as in fig. 302..... 5
- 4. Vertex long, sharp; face brown; dorsal surface of body usually tinged with red..... 18. *rubellus*

- Vertex shorter; face yellowish; dorsal surface of body cinereus, never brown or tinged with red ..... **17. cinereus**
- 5. Paired aedeagus processes each bearing a distinct inner branch at about two-fifths the distance from apex, fig. 302. . . . . 6  
Paired aedeagus processes not branched, as in fig. 303. . . . . 7
- 6. Brownish fulvous, unmarked. . . . . **26. fulvus**  
Brown, with a black pronotum, anterior portion of scutellum often black. . . . . **27. collaris**
- 7. Ventral processes, fig. 303, crossed and bent over dorsal portion of aedeagus, then curved ventrally; color greenish brown. . . . . **16. angustatus**  
Ventral paired processes not bent over dorsal aedeagus, but extending caudally to apexes of pygofer, as in fig. 305. . . . . 8
- 8. Face yellow, often margined with brown. . . . . 9  
Face irrorate with brown. . . . . 13
- 9. Dorsal portion of aedeagus thick, rather heavy, and broadly rounded at base, as in fig. 306. . . . . 10  
Dorsal portion of aedeagus more elongate, slender, and with basal curve more V-shaped and pointed at base, as in fig. 304. . . . . 11
- 10. Black above, face bright yellow. . . . . **28. frontalis**  
Grayish green, tinged with brown. . . . . **23. parvus**
- 11. Vertex twice as long as basal width between eyes. . . . . **29. slossoni**  
Vertex more than half as wide between eyes at base as median length. . . . . 12
- 12. Each pygofer, fig. 307, long and tapered to a narrow blunt apex; dorsal portion of aedeagus especially elongated. . . . . **19. acutus**

- Each pygofer shorter, more rounded; dorsal portion of aedeagus shorter, as in fig. 308. . . . . 13
- 13. Each style, fig. 308, with long apex formed by the gradual narrowing of the outer margin beyond middle; dorsal portion of aedeagus long and sinuate. . . . . **20. filamentus**  
Each style, fig. 309, abruptly narrowed at three-fourths its length, apical processes short; dorsal portion of aedeagus straight and thicker at base. . . . . **25. tenuis**
- 14. Each pygofer, fig. 310, short, with a bluntly pointed apex on dorsal margin; ventral paired processes broadly curved ventrally and anteriorly at apexes. . . . . **21. cinnamoneus**  
Each pygofer, fig. 311, long, tapered gradually to narrow blunt apex, greatly exceeding plates. . . . . **22. abbreviatus**
- 15. Blades of ventral aedeagus processes without spines on dorsal or inner surfaces, as in fig. 303. . . . . 16  
Blades of ventral aedeagus processes bearing some kind of pointed spinelike structures on dorsal or inner surface, as in fig. 315. . . . . 18
- 16. Blades scarcely widened on apical portion, fig. 303. . . . . **16. angustatus**  
Blades distinctly widened, as in figs. 312, 314. . . . . 17
- 17. Face brown, vertex appearing banded transversely. . . . . **1. verecundus**  
Face yellow, with darker margins, vertex not appearing banded. . . . . **2. argutus**
- 18. Face and vertex pale; pronotum, scutellum, and elytra darker. . . . . 19  
Vertex brown or black, with pale longitudinal markings. . . . . 20
- 19. Face and vertex white; pronotum, scutellum, and elytra shiny black, with few pale spots or areoles. . . . . **14. bicolor**

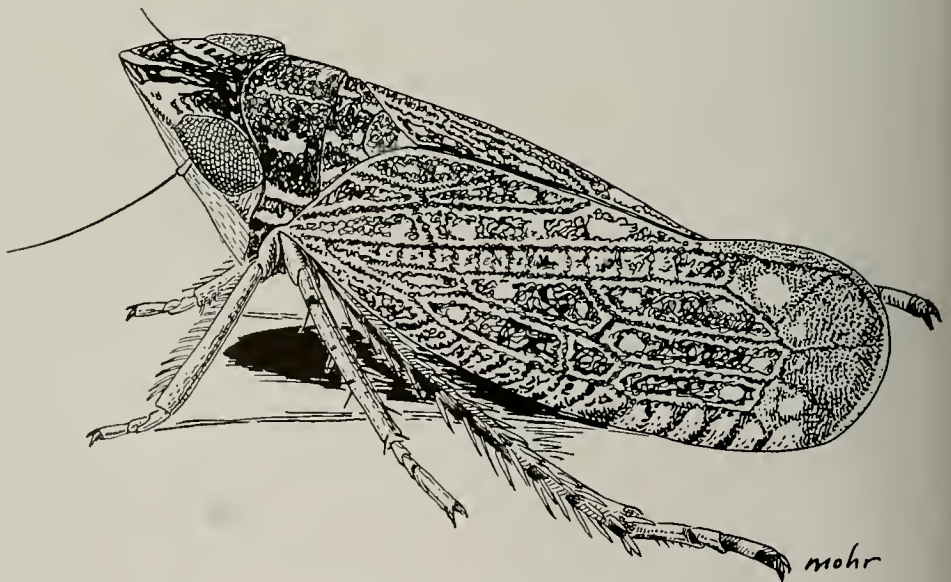
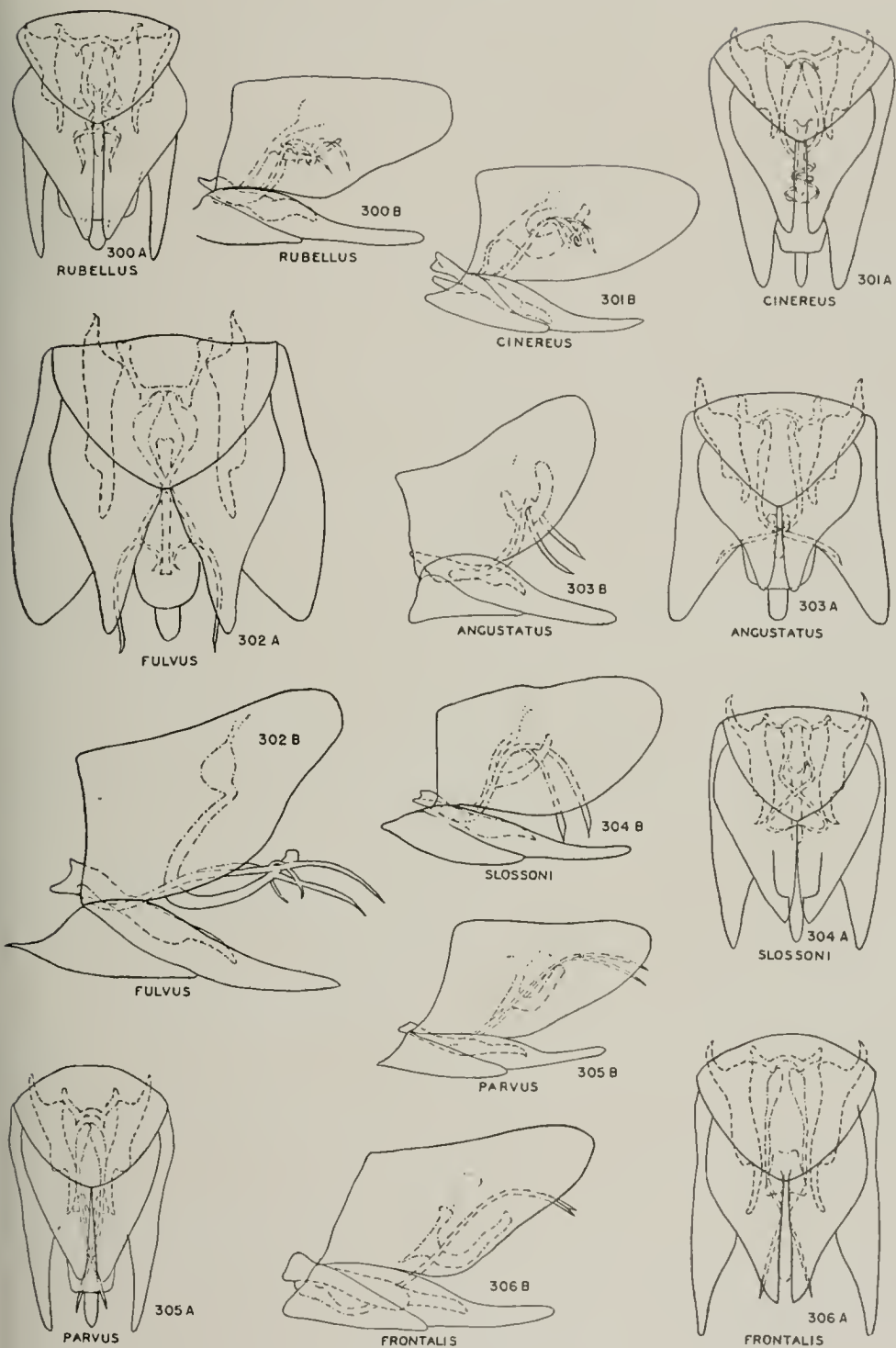
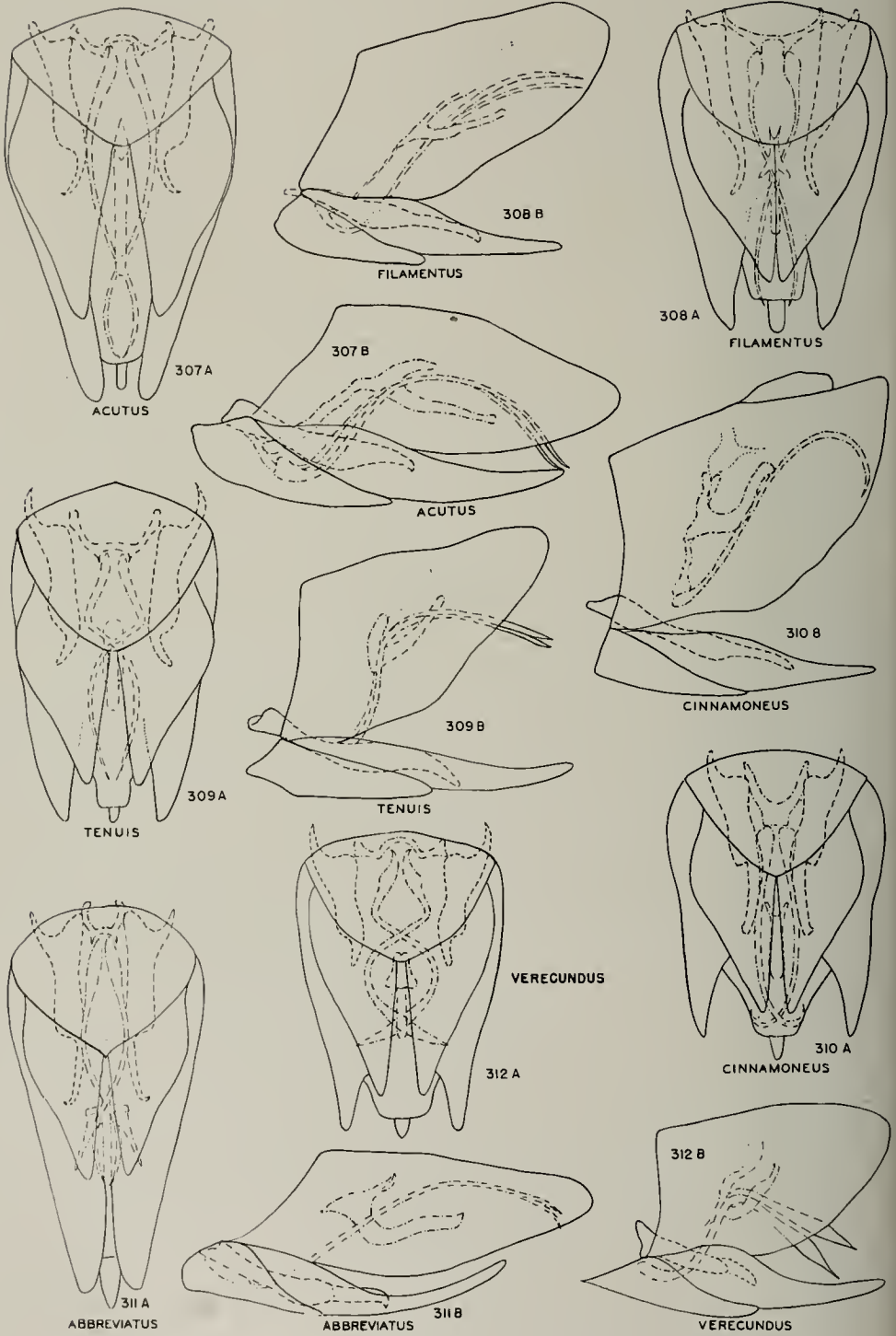


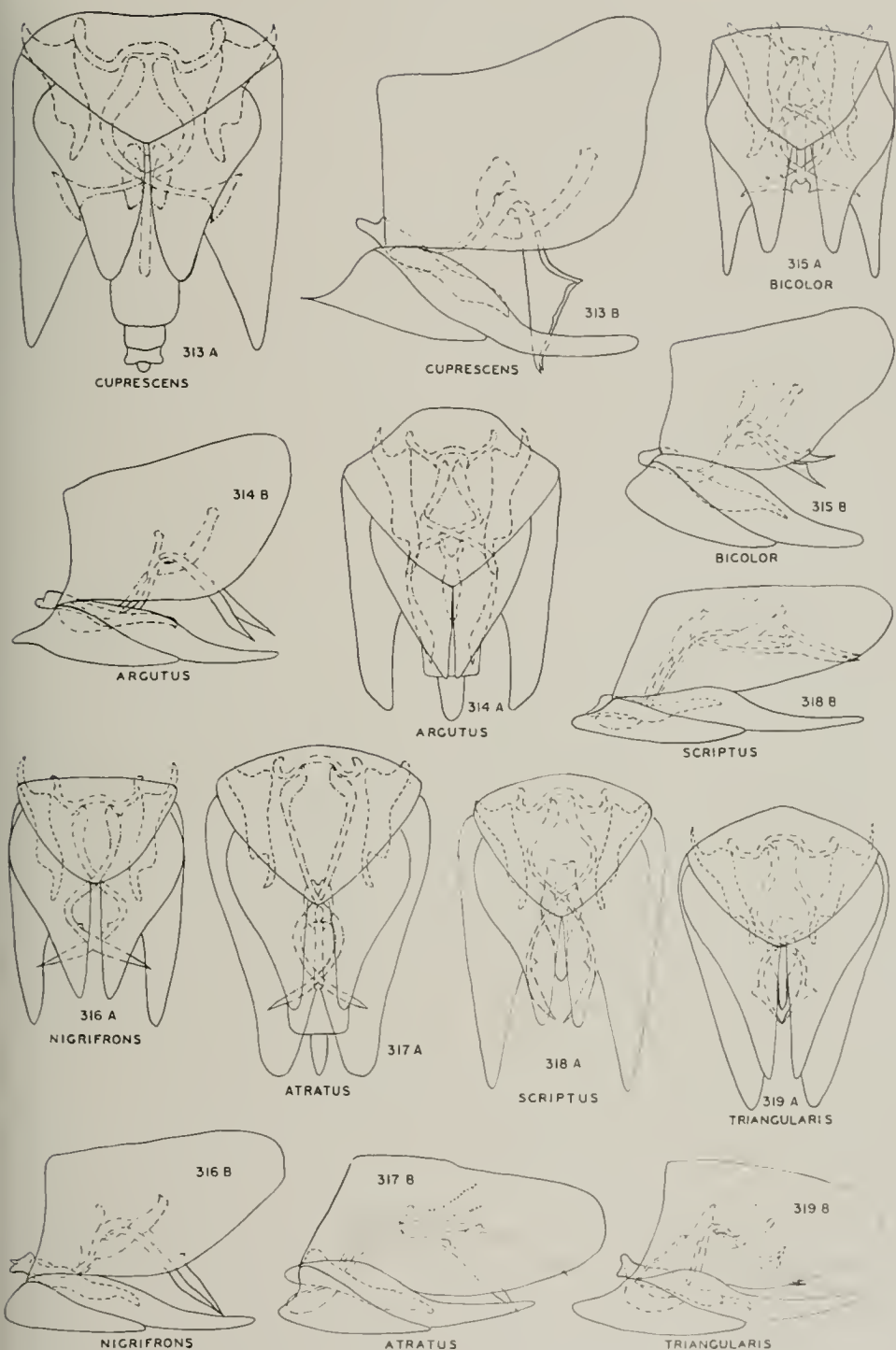
Fig. 299.—*Cloanthanus frontalis*.



Figs. 300-306.—*Cloanthanus*, male genitalia. A, ventral aspect; B, lateral aspect.



Figs. 307-312.—*Cloanthanus*, male genitalia. A, ventral aspect; B, lateral aspect.



Figs. 313-319.—*Cloanthanus*, male genitalia. A, ventral aspect; B, lateral aspect.

- Face and vertex dull yellow; pronotum irrorate with brown, elytra pale, with brownish irrorations, apex of each elytron pale. . . . . **13. dorsalis**
20. Face yellowish. . . . . 21  
Face brown or black. . . . . 23
21. Vertex long and pointed; blades of aedeagus processes, fig. 313, forming large triangular plates at apex. . . . . **15. cuprescens**  
Vertex pointed but shorter; apical portions of processes formed into elongate blades, as in figs. 321, 324. . . . . 22
22. Blade of each aedeagus process, fig. 321, widened between spine and apex. . . . . **3. hastus**  
Blade of each aedeagus process, fig. 324, tapering from spine to apex. . . . . **4. lanceus**
23. Spine large, forming a triangle with apex, fig. 319. . . . . **12. triangularis**  
Spine smaller, at least one-fourth the distance from apex and not forming a triangular apex, as in fig. 317. . . . . 24
24. Blades narrow, spine almost one-half the distance from apex to base, as in fig. 317. . . . . 25  
Blades shorter, spine nearer apex, not more than one-third the distance from apex to base, as in fig. 322. . . . . 27
25. Vertex dark, with few pale markings; face almost black. . . . . **9. atratus**  
Vertex with pale markings, appearing transversely banded; face brown. . . . . 26
26. Spine conspicuous, each style with narrow apical processes about one-fifth the length of entire style, fig. 320. . . . . **10. magdalensis**  
Spine minute, each style with narrow apical processes about one-third the length of entire style, fig. 325. . . . . **11. vaccinium**
27. Vertex appearing banded or marked with pale areas; face pale brown or with brownish irrorations. . . . . 28  
Vertex dark brown to black, with few pale markings; face dark brown to black. . . . . 29
28. Vertex white, with brown markings; aedeagus blade, fig. 322, narrow, spine large, bent inwardly, slightly broadened between spine and apex. . . . . **7. varius**  
Vertex more brownish, with a banded appearance; blade, fig. 323, broadest at spine, concavely tapered on dorsal margin to sharp-pointed apex. . . . . **8. andromus**
29. Face black; aedeagus blade, fig. 316, narrow, about uniform in width between delicate spine and apex. . . . . **5. nigrifrons**  
Face dark brown; blade, fig. 318, broadest at blunt spine, from which it is tapered to sharp-pointed apex. . . . . **6. scriptus**
30. Face and vertex pale, unmarked; pronotum and elytra darker. . . . . 31  
Vertex not pale, unmarked. . . . . 32
31. Face and vertex white; pronotum, scutellum, and elytra shiny black, elytra with few pale markings. . . . . **14. bicolor**  
Face and vertex dull yellow; pronotum irrorate with brown, scutellum pale, elytra with pale brownish irrorations, each apex pale. . . . . **13. dorsalis**
32. Fulvous brown, pronotum and anterior portion of scutellum black. . . . . **27. collaris**  
Color black or brown, but not brown with black pronotum. . . . . 33
33. Color black above, face bright yellow. . . . . **28. frontalis**  
Color not black above, not with bright yellow face. . . . . 34
34. Face some shade of yellow, often margined with brown. . . . . 35  
Face pale to dark brown or black. . . . . 43
35. Vertex long, sharp pointed, usually less than two-thirds as wide between eyes at base as median length. . . . . 36  
Vertex shorter, often sharply angled, usually more than two-thirds as wide between eyes as median length. . . . . 38
36. Color usually dark brown, tinged with red above and on face. . . . . **18. rubellus**  
Cuprescent or pale brownish, not tinged with red. . . . . 37
37. Pale brown. Known only from Florida. . . . . **29. slossoni**  
Copper colored. Known only from the northeastern United States. . . . . **15. cuprescens**
38. Gray, tinged with green above and on face. . . . . **16. angustatus**  
Not tinged with green. . . . . 39
39. Gray in color. . . . . 40  
Brown or fulvous in color. . . . . 41
40. Length 4.0 mm. . . . . **17. cinereus**  
Length 3.5 mm. . . . . **23. parvus**
41. Fulvous brown in color, with few pale or areolar spots except at apical crossveins. . . . . **26. fulvus**  
Brown, with numerous pale and areolar spots throughout the elytra. . . . . 42
42. Vertex sharply pointed, heavily infuscated with brown. . . . . **2. argutus**  
Vertex usually blunter, pale brown, less heavily infuscated. . . . . **19. acutus, 20. filamentus, 25. tenuis**
43. Vertex twice as long as basal width between eyes, banded. . . . . **1. verecundus**  
Vertex shorter, not less than two-thirds as wide between eyes as median length. . . . . 44
44. Vertex appearing banded transversely. . . . . 45  
Vertex dark in color or without bands. . . . . 47
45. Vertex pale, with dark markings, pale areas large and conspicuous. . . . . **7. varius**  
Vertex darker, pale areas small. . . . . 46
46. Band on vertex formed by a V-shaped lighter spot on either side of vertex anterior to eyes. Known only from Florida. . . . . **8. andromus**  
Band usually less conspicuous, without V-shaped pale areas at sides of vertex. . . . . **10. magdalensis, 11. vaccinium**
47. Vertex with a sharp-pointed produced apex. . . . . 48  
Vertex less sharply produced. . . . . 49
48. Face pale brown. . . . . **21. cinnamomeus**  
Face dark brown. . . . . **22. abbreviatus**
49. Elytra shiny black, with few pale or areolar spots except on apical crossveins. . . . . **5. nigrifrons**



- Elytra black or brown, mottled with pale spots or areoles . . . . . 50  
 50. Brown in color, with white longitudinal marks on vertex . . . . . **6. scriptus**  
 Black in color, vertex marked with fewer light lines or spots . . . . . **9. atratus**

### 1. *Cloanthanus verecundus* (Van Duzee)

*Platymetopius verecundus* Van Duzee (1910, p. 227).

Length 3.5–4.0 mm. Vertex rather sharply angled, more than twice as long at middle as basal width between eyes. Dark brown, tinged with orange, a broken pale band across vertex before anterior margins of eyes, and pale spots at base of vertex. Pronotum marked with five longitudinal lines. Scutellum orange. Elytra pale, with rather sparse reticulations, leaving many pale areas and areolar spots; veins brown. Face rather heavily irrorate with brown.

Female seventh sternite roundedly produced on posterior margin. Male plates almost as long as pygofer, gradually narrowed to blunt apices. Each style with short narrow finger-like apex produced on inner margin. Aedeagus, fig. 312, with a rather narrow dorsal portion that is narrowed on apical fourth and curved upward at base; ventral paired processes long and curved, with widened spearlike blades on apical third; spines absent.

This species is known only from Florida and the southeastern states.

### 2. *Cloanthanus argutus* DeLong

*Cloanthanus argutus* DeLong (1945, p. 24).

Length 4 mm. In form and general appearance resembling *hastus* but smaller and with distinctive male genitalia. Vertex rather sharply angled, a little more than half as wide as median length, one-fourth longer than pronotum. Dorsum dark brown, with pale markings. Vertex with conspicuous pale longitudinal vittae. Pronotum with several pale punctate spots. Elytra with brown veins and irrorate markings, leaving pale areas throughout and several round pale areolar spots. Face dull yellow below, brown above.

Female seventh sternite roundedly produced on posterior margin. Male plates shorter than pygofer, gradually sloping to bluntly pointed apices. Each style, fig. 314, narrowed somewhat at about three-fourths its length, apex rather broad, blunt, and

produced about one-fourth the length of style; dorsal portion of style medium in length, a little narrower at apex than base. Ventral paired processes of aedeagus with apical third widened to form a narrow blade that does not bear a spine on dorsal margin. Each pygofer broadly rounded at apex.

This species is recorded only from Georgia.

### 3. *Cloanthanus hastus* DeLong

*Cloanthanus hastus* DeLong (1945, p. 24).

Length 4.5 mm. Resembling *acutus* in form and general appearance but with a pale brown face. Vertex elongate, sharply angled, decidedly more than half as wide between eyes at base as median length. Dorsum rather dark brown, vertex with median apical vitta and slender elongate lines pale. Pronotum with five longitudinal vittae. Elytra rather heavily irrorate with brown, veins brown; many pale areas and areolar spots. Face pale brown.

Female seventh sternite roundedly produced on posterior margin. Male plates almost as long as pygofer, gradually narrowed to blunt apices. Each style, fig. 321, elongate, with abruptly narrowed finger-like process on inner margin of apex, the process almost one-third the length of the style. Aedeagus with the dorsal portion rather short and thickened and bluntly pointed at base; paired ventral processes each long and narrow to apical fifth, then widened to form spearlike blade that is pointed at apex, each blade bearing a small spine on the upper surface about one-fourth the distance from apex.

This species has been collected in Wisconsin, Ohio, Missouri, and Illinois.

**Illinois Records.**—Many males and females, taken May 18 to October 2, are from Alton, Cave in Rock, Centralia, Des Plaines, Dixon, Dolson, Eichorn, Fairfield, Galena, Geff, Herod, Keithsburg, Mahomet, Ozark, Pulaski, Vienna, Wauconda, and White Pines Forest State Park.

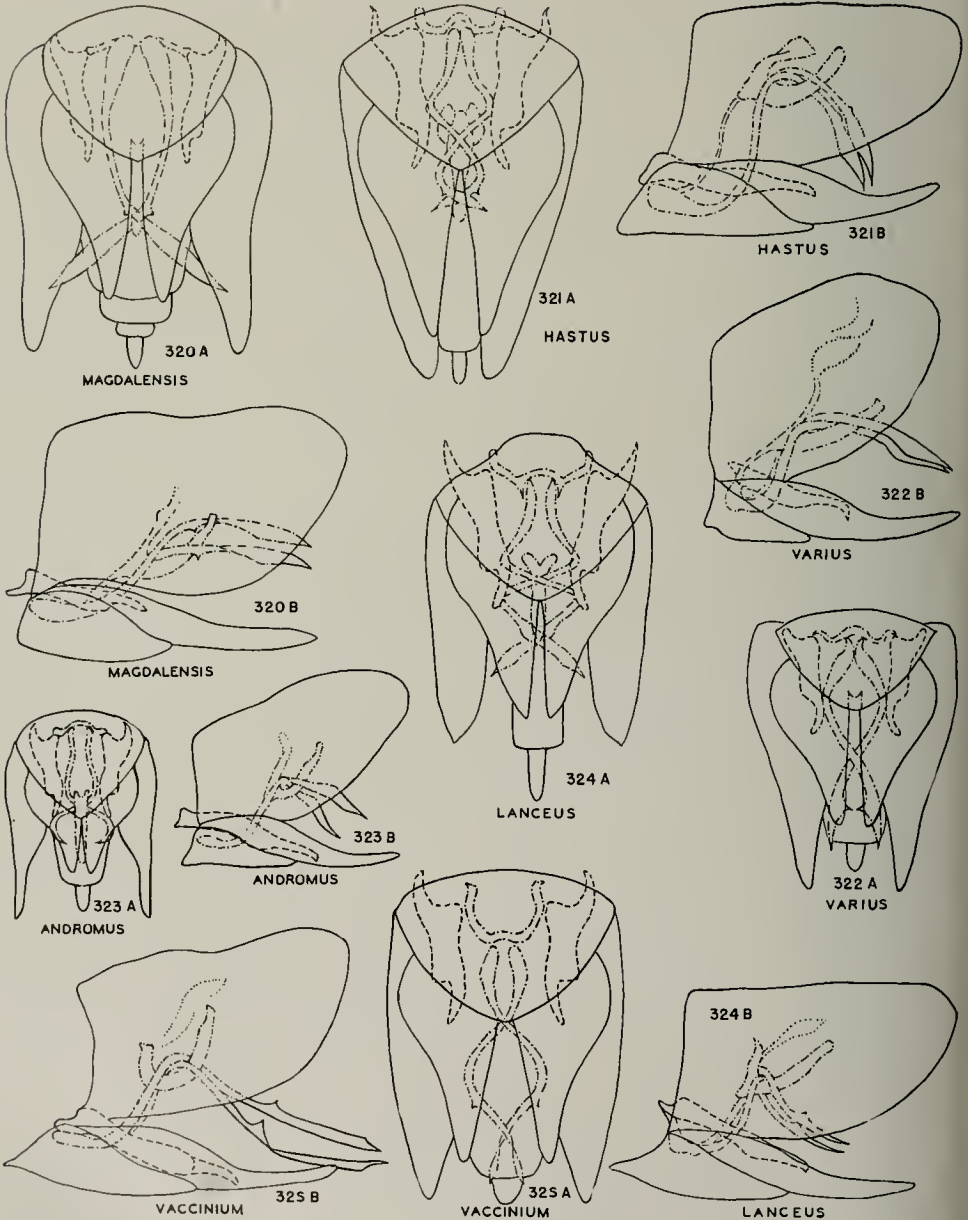
### 4. *Cloanthanus lanceus* DeLong

*Cloanthanus lanceus* DeLong (1945, p. 26).

Length 4 mm. Small, sharp headed, resembling *argutus* in general appearance but with distinctive genitalia. Vertex sharply pointed, almost half as wide between eyes at base as median length. Vertex pale

brownish, with longitudinal pale markings. Pronotum dark brown, with five pale longitudinal vittae. Scutellum paler than pronotum, apex pale brown. Elytra finely irrorate with dark brown, only a few pale spots visible and with few areolar spots. Face uniform dull yellow to pale brown, without infuscation above.

Female seventh sternite roundedly produced on posterior margin. Male style, fig. 324, notched on outer margin at about three-fourths its length, forming a finger-like process that is produced to form the apex of the style. Dorsal portion of the aedeagus medium in length, with a sharp bend at base; ventral paired processes curved



Figs. 320-325.—*Cloanthanus*, male genitalia. A, ventral aspect; B, lateral aspect.

through the bend in the dorsal portion, their apices broadened to form bladelike structures that extend about one-fourth the length of process and bear a pointed heel on upper inner angle of blade.

This species has not been taken in Illinois. It was described from Georgia.

##### 5. *Cloanthanus nigrifrons* (DeLong)

*Platymetopius frontalis* var. *nigrifrons* DeLong (1923, p. 103).

Length 4 mm. Vertex short, bluntly angled, three-fourths as wide between eyes at base as median length. Black, vertex marked with white elongate spots. Pronotum with faint traces of white. Elytra black, shiny, with few white markings represented only by white areolar spots along commissural line of each clavus, and before and posterior to the apical crossveins. Face heavily irrorate with dark brown or black.

Female seventh sternite roundedly produced on posterior margin. Male plates almost as long as pygofer, gradually narrowed and rather blunt at apices. Each style, fig. 316, rather narrow, apical fourth abruptly narrowed and produced on inner margin to form a long slender finger-like process. Dorsal portion of aedeagus rather long and thick, with apical fifth narrowed; ventral paired processes long and slender to apical fourth, which is broadened to form spearlike blades with sharp-pointed apices and a rather prominent spine on upper margin almost one-third the distance from apex.

This black-faced species was described from Connecticut.

##### 6. *Cloanthanus scriptus* (Ball)

*Platymetopius scriptus* Ball (1909b, p. 165).

Length 4 mm. Vertex short, about three-fourths as wide between eyes at base as median length. Dark brown, vertex with a median white apical longitudinal vitta, a white one along margin next to each eye, a pair of discal white spots and small white spots at base. Pronotum marked with five longitudinal vittae. Scutellum with white spots on disc, basal angles tan. Elytra irrorate with brown, veins brown, pale areas throughout, and each elytron with round white areolar spots on apical portion; numerous brown costal veinlets. Face heavily irrorate with brown.

Female seventh sternite roundedly produced posteriorly. Male plates broad at bases and with narrow rounded apices. Each style, fig. 318, elongate, apical fourth produced into a slender finger-like apex on inner margin. Aedeagus with dorsal portion long, narrowed just before apex, pointed at base, with an upturned spur; ventral paired pieces long and slender, with widened blades at apex that have barblike spines dorsally about one-third the distance from apex.

This species occurs in the middle western states and has been collected from several localities in Illinois.

**Illinois Records.**—Many males and females, collected May 18 to October 3, are from Anvil Rock, Apple River Canyon State Park, Elizabethtown, Marshall, Monticello, Ozark, Starved Rock State Park, Warren, and White Heath.

##### 7. *Cloanthanus varius* DeLong

*Cloanthanus varius* DeLong (1945, p. 26).

Length 4 mm. Resembling *magdalensis* in form but with vertex white, mottled with brown, and with distinct male aedeagus. Vertex short, blunt, more than three-fourths as wide between eyes as median length. Vertex with a marginal bar on either side at apex, and longitudinal brown vittae at apex and between eyes, giving it a transversely banded appearance. Pronotum dark brown. Scutellum tawny, with white spots on median portion. Elytra brown, heavily irrorate, with pale areolar spots. Face heavily irrorate with brown.

Female seventh sternite roundedly produced on posterior margin. Male pygofer decidedly longer than plates. Apical third of each style, fig. 322, narrowed to a slender curved finger-like process. Dorsal portion of aedeagus rather long, constricted just before apex; each of ventral paired processes broadened on apical fourth to form a blade; spine on upper margin about one-third the distance from apex and bent inwardly on dorsal margin.

This species is known only from Illinois.

**Illinois Records.**—DIXON SPRINGS: July 9, 1935, DeLong & Ross, 1 ♀. ELIZABETHTOWN: June 25, 1932, Ross, Dozier, & Park, 1 ♀. MARSHALL: Sept. 27, 1935, Frison & Ross, 1 ♀. MONTICELLO: June 11, 1934, Frison & DeLong, 1 ♂, 4 ♀. STARVED ROCK STATE PARK: July 14, 1932, Dozier

& Park, 1 ♀. WHITE PINES FOREST STATE PARK: July 12, 1934, DeLong & Ross, 1 ♀.

### 8. *Cloanthanus andromus* (Ball)

*Nasutoideus andromus* Ball (1931c, p. 221).

Length 4 mm. Vertex short, almost three-fourths as wide between eyes at base as median length. Vertex tawny, with short longitudinal vittae so arranged as to form a broken pale transverse band before anterior margins of eyes, and a narrower band at base. Pronotum brown, scutellum tawny. Elytra with veins brown, with sparse brown irrorations; costal veinlets brown, with numerous white areolar spots throughout the surfaces of elytra. Face pale brown.

Female seventh sternite roundedly produced on posterior margin. Male styles, fig. 323, each with a narrow apical finger-like process that is about one-fourth the length of style. Dorsal portion of aedeagus slender and elongate, curved at base, each of ventral paired processes with apical third broadened into blade that is sharp pointed; apex of each blade dorsally pointed.

This species is known only from Florida, but may occur in states farther north.

### 9. *Cloanthanus atratus* DeLong

*Cloanthanus atratus* DeLong (1945, p. 27).

Length 4 mm. In form and general appearance similar to *vaccinium* but with narrower aedeagus blades. Vertex about three-fourths as wide at base as median length. Color brown, vertex with few pale markings, short apical median vitta conspicuous. Elytra brown, with brown veins and scattered brown irrorations, leaving many pale areas and white areolar spots. Face heavily irrorate with brown. Male plates decidedly shorter than pygofers. Each style, fig. 317, with short narrow apical process that is about one-fourth the length of style. Dorsal portion of aedeagus broad at base, narrowed on apical fourth; each of ventral paired processes with apical third widened to form narrow blade, a small spine on dorsal margin more than one-third the distance from apex.

This species is known only from Illinois.

Illinois Records.—OREGON: Castle Rock, June 30, 1935, DeLong & Ross, 2 ♂. Volo: in bog, Aug. 24, 1935, DeLong & Ross, 1 ♂.

### 10. *Cloanthanus magdalensis* (Provancher)

*Platymetopius magdalensis* Provancher (1889, p. 275).

*Platymetopius obscurus* Osborn (1905a, p. 274).

Length 4.5 mm. In form and general appearance resembling *acutus* but with banded vertex and brown face. Vertex short and broad, more than two-thirds as wide between eyes as median length; brown, short white vittae arranged to form a broken transverse band before anterior margins of the eyes, and a pale band at base. Pronotum dark brown, scutellum pale brown. Elytra brownish subhyaline, with darker irrorations and with numerous pale areas and areolar spots. Face brownish irrorate. Male plates not reaching apexes of pygofers, plates gradually narrowed to bluntly pointed apexes. Each style, fig. 320, narrow, with short blunt narrowed finger-like apex that is about one-fifth the length of the style. Dorsal portion of aedeagus gradually narrowed from a rather thickened base to narrow apex; ventral paired processes each long and narrow to apical third, which is widened, bladelike, and with a prominent dorsal spine almost half the distance from apex.

This species is northeastern in distribution and occurs on species of *Vaccinium*.

### 11. *Cloanthanus vaccinium* DeLong

*Cloanthanus vaccinium* DeLong (1945, p. 27).

Length 4.5 mm. Short, broad headed, closely related to *magdalensis* but with some differences in the male genitalia. Vertex three-fourths as wide between eyes at base as median length; brown, appearing banded with conspicuous elongate white vittae at middle of apex and base. Elytra dull brown, with scattered darker brown irrorations; veins brown; white areolar spots along commissure of each clavus and in base of each apical and apex of each antepical cell. Face heavily irrorate with brown. Each male style, fig. 325, abruptly narrowed at two-thirds its length, apical third finger-like and curving slightly outward. Dorsal portion of aedeagus broadly curved at base, narrowed on anterior margin at apex; ventral paired processes with apical third broadened into bladelike portions; a large conspicuous

spine on dorsal margin more than one-third the distance from apex.

This species is considered a synonym of *magdalensis* by Hepner (1946), but I believe that for the present it is advisable to consider the two species as distinct, based on the characteristics given in the key. More material from various parts of the range of the two species will ultimately solve this problem.

This species is known only from Illinois, and was taken on *Vaccinium* in bogs.

**Illinois Records.**—DIXON: Sept. 17, 1935, DeLong & Ross, 1 ♀. GRAND DETOUR: July 12, 1934, DeLong & Ross, 2 ♀. VOLO: July 27, 1934, DeLong & Ross, 1 ♀; in bog, Aug. 24, 1935, DeLong & Ross, 3 ♀.

### 12. *Cloanthanus triangularis* DeLong

*Cloanthanus triangularis* DeLong (1945, p. 27).

Length 4 mm. Resembling *magdalensis* but with a more pointed vertex and distinctive male genitalia. Vertex sharply angled, almost twice as long at middle as basal width between eyes; dark brown, with slender pale vittae. Elytra pale brown, irrorate with darker brown, leaving many pale areas and areolar spots; veins brown. Face heavily irrorate with brown. Male plates almost as long as pygofers. Each style, fig. 319, with apical third narrowed and produced as finger-like process. Dorsal portion of aedeagus rather short, narrowed to blunt apex; ventral paired processes enlarged near apex to form large pointed spines on upper surface, spines about one-sixth the distance from apex.

This species has been collected only in Illinois.

**Illinois Records.**—EICHORN: Hicks Branch, June 13, 1934, DeLong & Ross, 1 ♀. NORRIS CITY: June 17, 1934, DeLong & Ross, 1 ♀. SHAWNEETOWN: June 14, 1934, Ross & DeLong, 11 ♂, 19 ♀; June 27, 1936, DeLong & Mohr, 1 ♀.

### 13. *Cloanthanus dorsalis* (Ball)

*Platymetopius frontalis* var. *dorsalis* Ball (1909b, p. 164).

Length 4.5 mm. Vertex bluntly angled, three-fourths as wide between eyes at base as median length. Vertex, face, and venter pale yellow. Pronotum irrorate with brown.

Scutellum pale, with brown basal angles. Elytra pale, with brownish irrorations except on apical portions; apical half of each clavus pale, white areolar spots along commissural line and on corium and along apical crossveins; costal veinlets brown.

This species was described from Kansas. In Illinois three specimens have been taken that are quite similar to the type specimen and have been referred to this species. The male is unknown.

**Illinois Records.**—DOLSON: July 24, 1936, DeLong & Mohr, 1 ♀. EICHORN: Hicks Branch, June 13, 1934, DeLong & Ross, 1 ♀. ST. ANNE: July 20, 1934, DeLong & Ross, 1 ♀.

### 14. *Cloanthanus bicolor* (DeLong)

*Platymetopius bicolor* DeLong (1916, p. 38).

Length 4 mm. Vertex bluntly angled in the male, more than two-thirds as wide between eyes at base as median length. Vertex pale yellow, pronotum shiny black, scutellum black, with a white margin on apical angle. Elytra shiny black, without areoles except on anterior apical cells; apical border of each elytron white margined. Face and thorax below pale yellow, unmarked. Each male plate broad at base, narrow at apex, and rounded. Each style, fig. 315, with rather short finger-like process, which is narrowed and curved outwardly at apex. Dorsal process of aedeagus rather long, constricted just before rounded apex, and curved dorsally at base; ventral paired processes curved with half of a spearhead blade bearing a barblike spine at base about one-fourth the distance from apex.

This strikingly colored species is known only from one male collected in Tennessee.

### 15. *Cloanthanus cuprescens* (Osborn)

*Platymetopius cuprescens* Osborn (1905b, p. 517).

Length 5.5 mm. Vertex appearing sharp pointed, three-fifths as wide at base between eyes as median length. Brown, vertex with a short conspicuous pale vitta at apex. Pronotum with five pale longitudinal vittae. Elytra pale, irrorate with brown, having round white areoles and pale areas throughout the elytral surfaces. Face dull yellow, with a pale transverse band below apex, area darker between this pale band and margin

of vertex. Male plates rather short, with blunt apices. Dorsal process of aedeagus, fig. 313, with a rather long ventral portion, curved upward at base; a pair of ventral processes extending from base, curved around dorsal portion, then protruding to form in apical region broad triangular blades, each comprising about one-fourth of the entire ventral process.

This is the most common of the northern long-headed species of the genus.

**Illinois Records.**—Many males and females, taken May 27 to October 3, are from Alton, Antioch, Apple River Canyon State Park, Cave in Rock, Centralia, Dixon, Dolson, Dubois, Eichorn, Elizabethtown, Evergreen Park, Galena, Geff, Gibsonia, Grand Detour, Havana, High Knob, Jonesboro, Keithsburg, Mahomet, Monticello, Oregon, Palos Park, Pike, St. Anne, Vienna, Volo, White Pines Forest State Park, and Wolf Lake.

#### 16. *Cloanthanus angustatus* (Osborn)

*Platymetopius angustatus* Osborn (1905b, p. 518).

Length 4 mm. Vertex in male bluntly pointed, about two-thirds as wide between eyes as median length, with longitudinal pale vittae. Pronotum irrorate with brown; scutellum tan. Elytra greenish-brown subhyaline, without areolar spots except before and just posterior to apical crossveins; posterior costal and apical veinlets broadly brown. Face tawny, male plates rather short, with narrow rounded apices. Each style, fig. 303, with an abruptly narrowed, short, finger-like process on inner margin, about one-fifth the length of style. Dorsal process of aedeagus rather short and thick; paired ventral processes long and slender, curved about the dorsal process, and with very narrow scarcely widened blades.

This species has been recorded from New York and Missouri, and has been collected on pine in coniferous forests.

#### 17. *Cloanthanus cinereus* (Osborn & Ball)

*Platymetopius cinereus* Osborn & Ball (1897, p. 193).

Length 4 mm. Vertex rather short, two-thirds as wide as median length. Dorsum appearing greenish gray, with three con-

spicuous white longitudinal vittae on vertex. Pronotum with five conspicuous pale longitudinal vittae. Elytra light in color, with greenish-gray veins and sparse irrorations, veins on apical portion darker; large areas and areolar spots white. Face dull yellow. Each male style, fig. 301, with apical third narrowed and produced into a finger-like apex on inner margin. Dorsal portion of aedeagus rather broad at base, narrowed to about half its basal width at apex; ventral paired processes long, slender, and coiled around the dorsal portion of aedeagus.

This is the common prairie form of the genus and is found abundantly on the Illinois prairies. It has been recorded from the southeastern United States and from the Middle West.

**Illinois Records.**—Many males and females, taken from June 12 to October 2, are from Alsip, Amboy, Carman, Cave in Rock, Des Plaines, Elizabeth, Evergreen Park, Fairfield, Fulton, Grand Detour, Gulfport, Hanover, Kampsville, Mokenca, Oak Lawn, Oquawka, Oregon, Palos Park, Port Byron, Putnam, St. Anne, Spring Valley, Urbana, Watson, and Zion.

#### 18. *Cloanthanus rubellus* (Sanders & DeLong)

*Platymetopius rubellus* Sanders & DeLong (1919, p. 231).

Length 4.0–4.5 mm. Vertex strongly produced and sharply angled, less than two-thirds as wide between eyes at base as median length. Dorsum reddish brown, tinged with dark red. Vertex with a pale median apical vitta, and a pale vitta on either side of median vitta. Pronotum with five pale longitudinal vittae. Scutellum tan. Elytra brownish subhyaline, with darker irrorations, costal veinlets on apical half of each elytron brown margined; white areolar spots on apical portion and along commissural line of clavus. Face tawny, tinged with red. Male plates broad at base, rather long, and extending almost to tips of pygofers. Apical third of each style, fig. 300, narrow, finger-like, and produced almost straight on inner margin. Aedeagus with a long slender dorsal process and a pair of long slender processes that are usually coiled around the dorsal process.

The sharp-pointed vertex and reddish color will usually separate this species, which

has been found only on the East Coast of the United States, from closely related forms.

19. *Cloanthanus acutus* (Say)

*Jassus acutus* Say (1831, p. 306).

Length 4.5 mm. Vertex produced rather sharply, almost two-thirds as wide between eyes at base as median length. Dorsum brown, vertex with median pale vitta at apex, and conspicuous pale vitta on disc. Pronotum dark brown, scutellum tawny. Elytra pale, with scattered dark brown irrorations, leaving many pale spots and areolar spots. Face yellow, heavily infuscated with brown above the white line and at sides. Male pygofer one-fourth longer than plates. Each style, fig. 307, with apical third abruptly narrowed and produced as a slender finger-like process that curves outwardly. Dorsal portion of aedeagus with a long slender ventral process that is sinuate and tapered to apex, the latter slightly enlarged; ventral paired processes long and narrowed to apices. Each pygofer long, narrowed to a blunt produced apex.

A common yellow-faced species, *acutus* is transcontinental in distribution.

**Illinois Records.**—Many males and females, taken from May 7 to September 24, are from Adair, Alton, Amboy, Antioch, Apple River Canyon State Park, Aurora, Bushnell, Cave in Rock, Chester, Cypress, Danville, Des Plaines, Dixon, Dolson, Dubois, Elizabethtown, Elgin, Evergreen Park, Fern Cliff, Fox Lake, Galena, Geff, Golconda, Grand Detour, Grays Lake, Gulfport, Hanover, Hardin, Harrisburg, Havana, Justice, Kankakee, Karnak, Keithsburg, Lincoln, Mason City, Mound City, Mounds, Muncie, Niota, Normal, Oak Lawn, Oakwood, Ogden, Onarga, Oregon, Ozark, Pecatonica, Princeton, Pulaski, Putnam, Quincy, Round Lake, St. Anne, Shawneetown, Sparta, Starved Rock State Park, Urbana, Vandalia, Vienna, Virginia, Volo, Warren, Waukegan, Wolf Lake, and Zion.

20. *Cloanthanus filamentus* DeLong

*Cloanthanus filamentus* DeLong (1945, p. 22).

Length 5 mm. Resembling *acutus* in form and general appearance, but paler in color and with a shorter dorsal aedeagus in male

and blunter pygofer. Vertex two-thirds as wide between eyes at base as median length. Dorsum light brown, with three pale vittae on anterior portion of body. Pronotum with the usual pale vittae. Apical half of scutellum pale. Elytra rather sparsely irrorate with pale brown so that many areolar spots and pale areas are seen throughout the surface. Face yellow, with brown margin above. Each male style, fig. 308, narrow, gradually narrowed just beyond middle to narrow curved apical process that is more than one-third the length of the style. Dorsal portion of aedeagus with an elongated narrow process that is shorter than in *acutus*. Ventral paired processes long, slender, extending almost to apex of pygofer. Pygofer more blunt at apex than in *acutus*.

This species was described from Pennsylvania and has been taken at several localities in Illinois.

**Illinois Records.**—AMBOY: May 21, 1917, 1 ♂; Aug. 8, 1934, DeLong & Ross, 1 ♂. DES PLAINES: Sept. 18, 1935, DeLong & Ross, 3 ♂. JUSTICE: July 23, 1937, Mohr & Burks, 1 ♀. KANKAKEE: Aug. 8, 1935, Ross & DeLong, 1 ♂. MOUNDS: May 23, 1932, H. L. Dozier, 1 ♂. OAK LAWN: sand prairie, July 27, 1934, DeLong & Ross, 1 ♂. OAKWOOD: Aug. 17, 1934, DeLong & Ross, 1 ♂. VOLO: July 16, 1935, DeLong & Ross, 1 ♂.

21. *Cloanthanus cinnamoneus* (Osborn)

*Platymetopius magdalenis* var. *cinnamoneus* Osborn (1915, p. 114).

Length 4 mm. Resembling *acutus* in form and general appearance but with face pale brown and with distinctive genitalia. Vertex bluntly angled, about two-thirds as wide between eyes at base as median length. Vertex, pronotum and scutellum cinnamon brown, with pale elongate lines and vittae. Elytra pale, with brown veins and rather heavy brown irrorations having numerous pale spots and areoles; costal veinlets broadly brown. Face irrorate with pale brown. Each male style, fig. 310, narrowed just beyond middle, apical half forming a long rather thick finger-like process. Dorsal portion of aedeagus rather short, apex slightly enlarged; ventral paired processes long, slender, apices curved ventrally and anteriorly.

This species has been taken only in

Canada, Maine, and other northern states bordering Canada. It is unique in genital characters.

## 22. *Cloanthanus abbreviatus* (DeLong)

*Platymetopius abbreviatus* DeLong (1916, p. 39).

Length 4 mm. Resembling *acutus* in form and appearance but with a brown face. Vertex bluntly angled, a little more than half as wide at base as median length. Vertex brown, with whitish longitudinal vittae. Pronotum dark brown, with five pale longitudinal vittae; scutellum paler. Elytra pale, with brown veins and rather sparse reticulations, leaving many white areas and areolar spots; numerous costal veins brown. Face marked with pale brownish irrorations. Male plates about two-thirds as long as pygofers. Each style, fig. 311, abruptly narrowed at less than two-thirds its length and produced as a long slender process that is curved or hooked at apex. Dorsal portion of aedeagus broadly curved at base, rather thick throughout its length, and sinuate, the apex pointed on inner margin; ventral paired processes long and narrow. Pygofers long, tapered to bluntly pointed apices.

This species was originally described from two female specimens from Tennessee. Additional specimens, including males, have since been taken in Wisconsin and Illinois.

**Illinois Records.**—AMBOY: Aug. 8, 1934, DeLong & Ross, 1 ♂. CAVE IN ROCK: Oct. 2, 1934, Ross, 2 ♂. EICHORN: Hicks Branch, June 13, 1934, DeLong & Ross, 2 ♀. OREGON: June 21, 1917, 1 ♂; Aug. 23, 1935, DeLong & Ross, 4 ♂, 4 ♀. ST. ANNE: Aug. 21, 1934, DeLong & Ross, 1 ♂; Aug. 4, 1936, Frison & Burks, 1 ♂. WOLF LAKE: July 30, 1934, DeLong & Mohr, 4 ♂.

## 23. *Cloanthanus parvus* (Lathrop)

*Platymetopius parvus* Lathrop (1917, p. 122).  
*Platymoides ovideus* Ball (1931c, p. 227).

Length 3.5 mm. Small, resembling *cinereus* in color and general appearance. Vertex blunt at apex, slightly more than half as wide between eyes at base as median length. Dorsum pale, marked with brown. Vertex completely lined with pale longitudinal vittae. Pronotum with brown reticulations and five conspicuous pale longitudinal vittae. Scutellum tawny. Elytra pale, marked with brown veins and sparse reticu-

lations; apex of each smoky, costal veinlets brown, numerous white spots and reticulations throughout. Face bright yellow, darker above. Each male style, fig. 305, abruptly narrowed at about two-thirds its length, apical third narrow and produced into a long finger-like process. Dorsal portion of aedeagus short and rather thick, broadly rounded at base; ventral paired processes long and slender, reaching almost to apex of pygofers.

This relatively minute species has been collected only in the southeastern United States.

## 24. *Cloanthanus parvus* var. *niger* DeLong

*Cloanthanus parvus* var. *niger* DeLong (1945, p. 27).

Length 3.5 mm. Resembling *parvus* in size and general appearance, but darker in color and with shorter and blunter vertex. Dark brown, vertex heavily irrorate with a few pale longitudinal markings. Pronotum with five pale vittae. Scutellum paler. Elytra irrorate with brown, leaving many pale spots and white areoles. Face pale brownish. Male genitalia similar to those of *parvus*. The dorsal portion of the aedeagus short, rather thick, broadly rounded at base; the ventral paired processes slender throughout.

Known only from Alabama, this variety appears to be distinct from typical *parvus* in general appearance.

## 25. *Cloanthanus tenuis* DeLong

*Cloanthanus tenuis* DeLong (1945, p. 24).

Length 4.5 mm. Resembling *acutus* in form and general appearance but with a shorter basally rounded dorsal process of the aedeagus. Vertex a little more than half as wide between eyes at base as median length. Pale brown, vertex with pale longitudinal vittae, especially on apical portion. Pronotum darker on disc, scutellum with apical portion orange yellow. Elytra marked with pale brownish irrorations, leaving many pale areas and areolar spots. Face yellow, with a brown border above.

Each male style, fig. 309, with short finger-like process at apex, about one-fifth the length of the style. Dorsal portion of aedeagus medium in length, narrow, and with base sharply curved; ventral paired



processes of aedeagus long and slender, reaching to apexes of pygoferes.

Described from South Dakota and Utah, this species has not been collected in Illinois.

### 26. *Cloanthanus fulvus* (Osborn)

*Platymetopius fulvus* Osborn (1905*b*, p. 519).

Length 4.5 mm. Vertex bluntly angled, in male less than two-thirds as wide between eyes at base as median length. Dorsum brownish fulvus, vertex paler, with three faint longitudinal vittae. Scutellum pale, lateral angles brown. Elytra with pale areoles before and caudad to apical cross-veins, apical veinlets broadly embrowned. Face dull yellowish, without darker margins. Male styles, fig. 302, each long and narrow, with finger-like process on inner margin, which is blunt at apex and projects about one-fourth the length of the style. Dorsal portion of aedeagus long and slender, bowed upward at base; ventral paired processes long and slender, with a slender branch arising on inner margin about two-fifths the distance from each apex.

This is a common species in some north-eastern states. It has been recorded from New York, Pennsylvania, and Ohio, but has not been taken in Illinois. It is similar to *collaris* in genital characters.

### 27. *Cloanthanus collaris* (Sanders & DeLong)

*Platymetopius collaris* Sanders & DeLong (1919, p. 232).

Length 4.5 mm. Closely related to *fulvus*; vertex more bluntly angled and pronotum dark brown or black. Vertex in male more than two-thirds as wide between eyes at base as median length. Median pale vitta at apex of vertex conspicuous. Pronotum dark brown to black, the lateral margins often paler. Scutellum with anterior half black, posterior portion brown. Elytra dark brown, costal veins and veins on apical portions brown, areoles occurring only just anterior and posterior to the apical cross-veins. Face pale brown. The male genitalia are similar to those of *fulvus*. Aedeagus with the long slender paired ventral processes each branched on inner margin about two-fifths the distance from apex.

This species, which is characteristically marked, is known at present only from the mountains of Pennsylvania.

### 28. *Cloanthanus frontalis* (Van Duzee)

*Platymetopius frontalis* Van Duzee (1890*b*, p. 112).

Length 4.0–4.5 mm. Vertex short, bluntly angled, three-fourths as wide between eyes at base as median length. Color black, vertex with conspicuous white vittae on apical portion. Pronotum usually with traces at least of pale longitudinal vittae. Scutellum black. Elytra heavily irrorate with dark brown or black, with numerous small white spots and white areoles; apex of each broadly margined with black. Face bright yellow, infuscated at sides and darker above. Male plates almost as long as pygoferes. Each style, fig. 306, abruptly narrowed at about two-thirds its length, apical third slender and produced into finger-like process. Dorsal portion of aedeagus rather long, broadly curved at base; ventral paired processes long and slender, reaching almost to tips of pygoferes.

This is a common species throughout Illinois, occurring on leguminous and other herbaceous plants and crops. It is recorded from the eastern United States, the Middle West, and California.

**Illinois Records.**—Many males and females, taken May 17 to October 3, are from Adair, Anvil Rock, Arlington Heights, Atlas, Barry, Beach, Bushnell, Cairo, Cave in Rock, Cobden, Cornfield, Cypress, Danville, Decatur, Des Plaines, Dolson, Dubois, Eichorn, Elizabeth, Evergreen Park, Fairfield, Fern Cliff, Fulton, Geff, Gibsonia, Glencoe, Grafton, Grand Detour, Grays Lake, Hamburg, Hanover, Hardin, Harrisburg, Havana, Herod, High Knob, Homer, Justice, Kampsville, Karnak, Kinmundy, Kirkwood, Lawrenceville, Luther, Makanda, Marshall, Momence, Mount Carmel, Muncie, New Holland, Normal, Oak Lawn, Oquawka, Oregon, Ozark, Princeton, Pulaski, Quincy, Seymour, Shawneetown, Sparta, Starved Rock State Park, Summit, Ullin, Urbana, Ursa, Vandalia, Vienna, Virginia, Ware, Watson, Waukegan, Wolf Lake, and Zion.

### 29. *Cloanthanus slossoni* (Van Duzee)

*Platymetopius slossoni* Van Duzee (1910, p. 222).

Length 4 mm. Resembling *acutus* in color but with a long sharp pointed vertex. Definitely less than half as wide between eyes

at base as median length; pale brownish, with pale longitudinal vittae. Pronotum dark brown, with five pale longitudinal vittae. Elytra pale, with brownish irrorations and brown veins, leaving many pale areas and pale areolar spots. Face yellow, infuscated with brown at margins and above. Male plates almost as long as pygofer, gradually narrowed to blunt tips. Apical one-third of each style, fig. 304, narrowed to form a thick finger-like process. Dorsal portion of aedeagus slightly tapered to a blunt apex; ventral paired processes narrow, scarcely widened at apexes, tips sharp pointed.

This long-headed species is known only from Florida.

### 50. *ACURHINUS* Osborn

*Acurhinus* Osborn (1920, p. 153).

Fig. 205. Head strongly produced, the vertex with sides nearly straight, apex acute, slightly concave above; frons reaching close to eyes, antennal pits touching eyes, and ocelli very close to eye borders; a distinct furrow beneath the front margin between vertex and front; front strongly convex. Costa with strongly reflexed veinlets next to the outer anteapical cell, which is much reduced.

Only one species from the United States is placed in this genus.

#### 1. *Acurhinus pyrops* (Crumb)

*Deltocephalus pyrops* Crumb (1915, p. 191).

Length 3.5–4.0 mm. Brownish yellow, with a very long pointed vertex. Eyes and ocelli bright red. Vertex with a black spot on either side of apex, a posterior spot and two pairs of transverse marks on disc fuscous. Face yellow, margined above with brown. Elytra pale, nervures margined with fuscous, costal areas yellowish.

Female seventh sternite, fig. 290C, with posterior margin gradually sloping to the middle third, which is almost squarely excavated one-fourth the distance to base and bears a short broad black tooth. Male plates, fig. 290, short and broad, lateral margins convexly rounded to broad blunt slightly divergent apexes.

This species occurs in the eastern United States, and is abundant in Illinois.

Illinois Records.—Many males and fe-

males, taken June 12 to October 3, are from Albion, Alton, Anvil Rock, Cave in Rock, Dixon Springs, Dolson, Dongola, Eichorn, Elizabethtown, Geff, Herod, Metropolis, Parker, St. Anne, Vienna, and Watson.

### 51. *FLEXAMIA* DeLong

*Flexamia* DeLong (1926a, p. 22).

Figs. 224, 326. Vertex strongly produced, pointed, disc flattened or slightly depressed, acutely and sharply angled with the front.

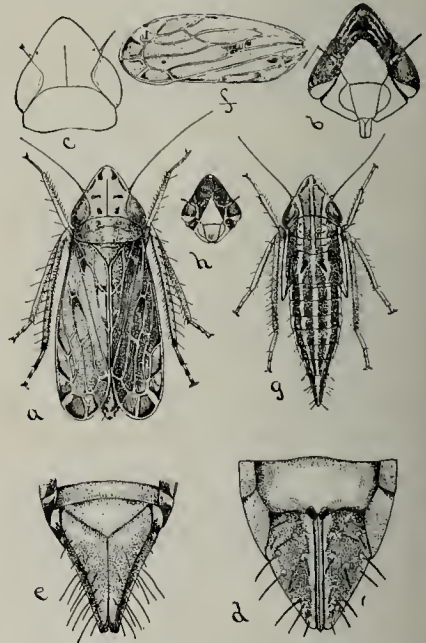


Fig. 326.—*Flexamia reflexa*: a, adult; b, face; c, head and pronotum; d, female genitalia; e, male genitalia; f, elytron; g, nymph; h, face of nymph. (From Osborn.)

Face elongated, elytra with apical costal veinlets reflexed or very short and right angled. Inner claval veins often partially coalescing, with or without appendix.

The species of this genus are usually conspicuously marked by the broad white coloration on the apical costal reflexed veinlets. In habit they are all grass feeding and live in meadows, pastures, and prairies. Twenty-seven species have been recorded for the United States, chiefly middle western regions. Eleven of these species have been taken in Illinois. Several others may occur in this state.

KEY TO SPECIES

1. Vertex, pronotum, and scutellum, fig. 327*A*, marked by heavy coalescing black bars and spots giving the appearance of a black wedge-shaped marking extending onto clavus of each elytron

**1. rubranura**

Vertex, pronotum, and scutellum without heavy black markings in the form of coalescing bars and spots

2. Color bright yellow or yellowish olive, with a large round black spot on center of each elytron; vertex, fig. 327*B*, without transverse marking

**2. areolata**

Color white, yellowish gray, or brownish yellow, spots when present on elytra smaller; vertex with transverse markings or longitudinal stripes, or both

3. White or lemon yellow, marked with conspicuous brown longitudinal stripes on base of vertex, on pronotum, and on scutellum

Some shade of brownish or grayish yellow, not white, and without definite longitudinal stripes on base of vertex, on pronotum, and on scutellum

4. Length not over 4.5 mm. Head and pronotum, fig. 327*C*, white with brown stripes. Elytra not appearing longitudinally striped

**3. albida**

Length more than 5 mm. Head and pronotum, fig. 327*D*, lemon yellow, with brown stripes. Elytra appearing longitudinally striped

5. Vertex broad, as wide between eyes as median length or slightly longer than width at base

Vertex more narrowed, decidedly longer at middle than basal width between eyes

6. Female seventh sternite, fig. 328*E*, with central obtuse lobe incised at middle and bearing a conspicuous black tooth at middle on each side. Male plates, fig. 337, truncate and divergent at tips; inner margins of pygofers enclosing long black styles that exceed plates

**5. stylata**

Female seventh sternite, fig. 328*F*, without conspicuous black teeth on margins of central lobe. Male plates, fig. 338, convexly rounded to bluntly pointed apexes; styles not visible

7. Female

**6. inflata**

8. Male plates, fig. 339, scarcely narrowed apically, broadly rounded

**7. pectinata**

Male plates decidedly narrowed apically, apexes not broadly rounded, as in fig. 342

9. Male plates, fig. 342, strongly divergent on apical third, apexes pointed

**8. sandersi**

Male plates with apexes appressed or proximal, not divergent on apical third, as in fig. 340

10. Male plates rather long, concavely rounded or straight on outer margins, not greatly exceeded by pygofers, as in fig. 340

Male plates shorter, convexly rounded to blunt apexes, exceeded by pygofers by at least half their length, as in fig. 332

13

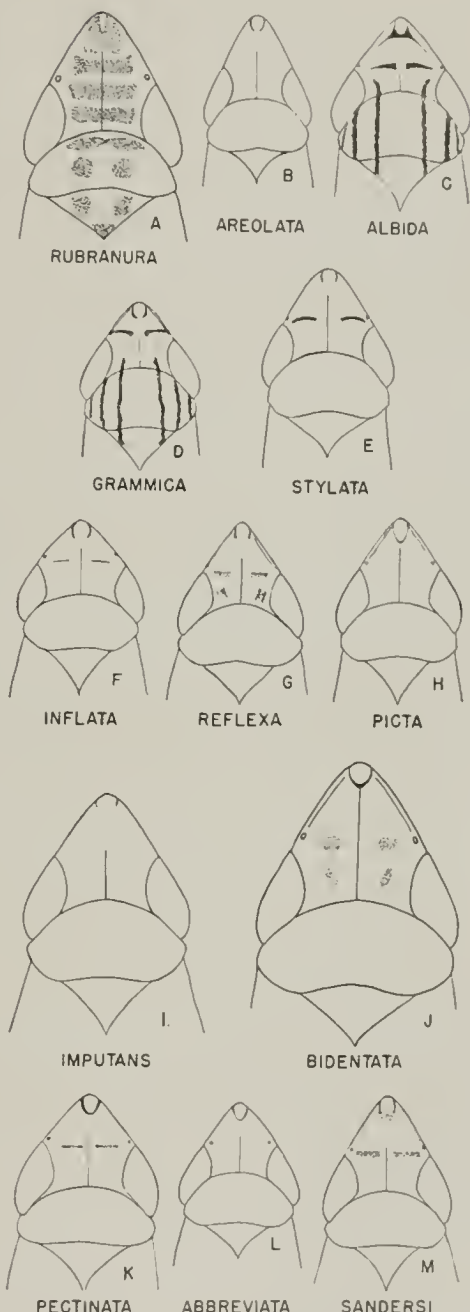


Fig. 327.—*Flexamia*, A-M, heads and pronota.

- 11. Male plates, fig. 340, with produced finger-like processes on outer margins at apex. Aedeagus with two terminal serrate processes.....**9. bidentata**  
Male plates without finger-like processes on outer margins at apex. Aedeagus with three terminal processes, as in fig. 341.....12
- 12. Aedeagus, fig. 341, with a dorsal terminal process; a large ventral process with two large spines at base; small processes at apex of aedeagus not serrate....**10. reflexa**  
Aedeagus, fig. 329, without a dorsal terminal process; large ventral process without spines; small lateral apical processes serrate.....**11. prairiana**
- 13. Plates very short, pygofers exceeding plates by their length. Aedeagus, fig. 331, with two terminal lateral processes.....**12. picta**  
Plates long, pygofers exceeding plates by about one-half their length, as in fig. 332.....14
- 14. Aedeagus, fig. 332, with terminal processes. Color creamy yellow, face black.....**13. imputans**  
Aedeagus, fig. 330, without terminal processes. Color pale cinereous, face infuscated.....**14. abbreviata**
- 15. Female seventh sternite, fig. 328G, notched, forming four median teeth on posterior margin.....**7. pectinata**  
Female seventh sternite with not more than two distinct teeth, as in fig. 328K.....16
- 16. Median notch on female seventh sternite, fig. 328K, forming two broad teeth, each of which is either truncate or concave at apex.....**14. abbreviata**  
Teeth of median portion of seventh sternite, if present, sharp pointed, sometimes wanting.....17
- 17. Posterior margin of seventh sternite truncate or sloping from lateral angles to median produced portion, figs. 328I, 328J.....**10. reflexa**, **8. sandersi**

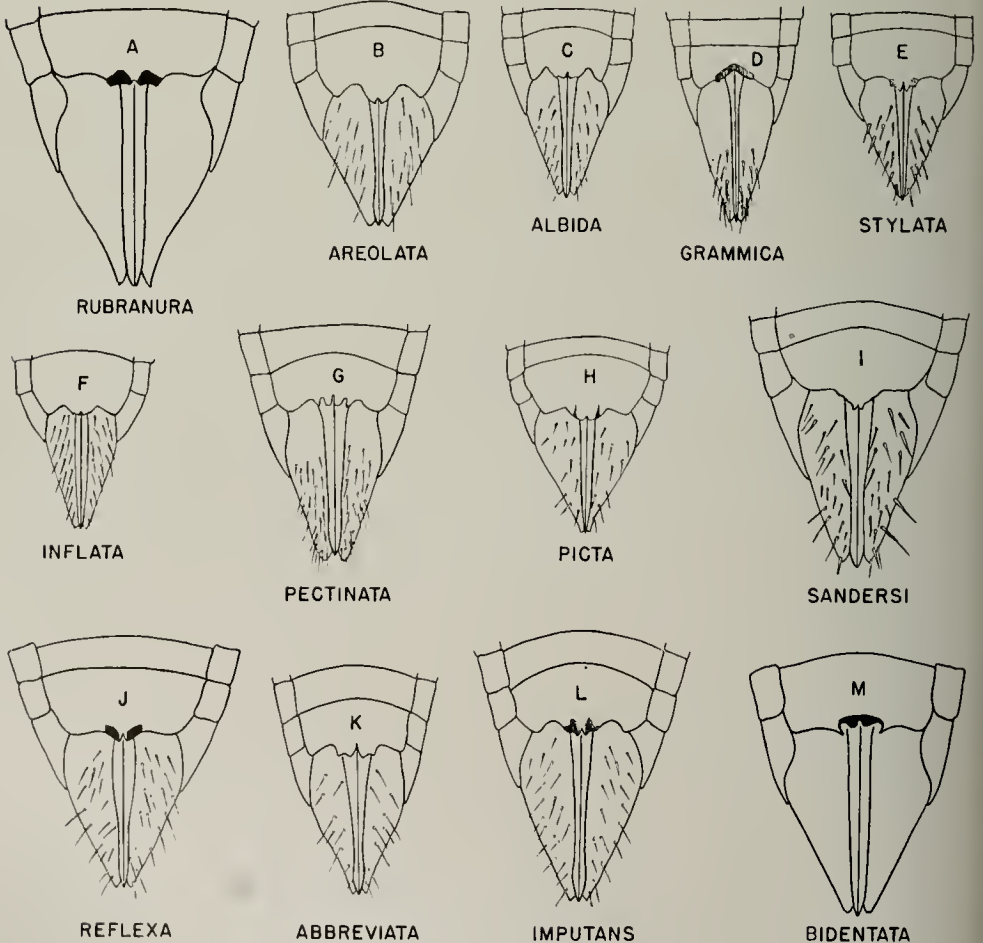
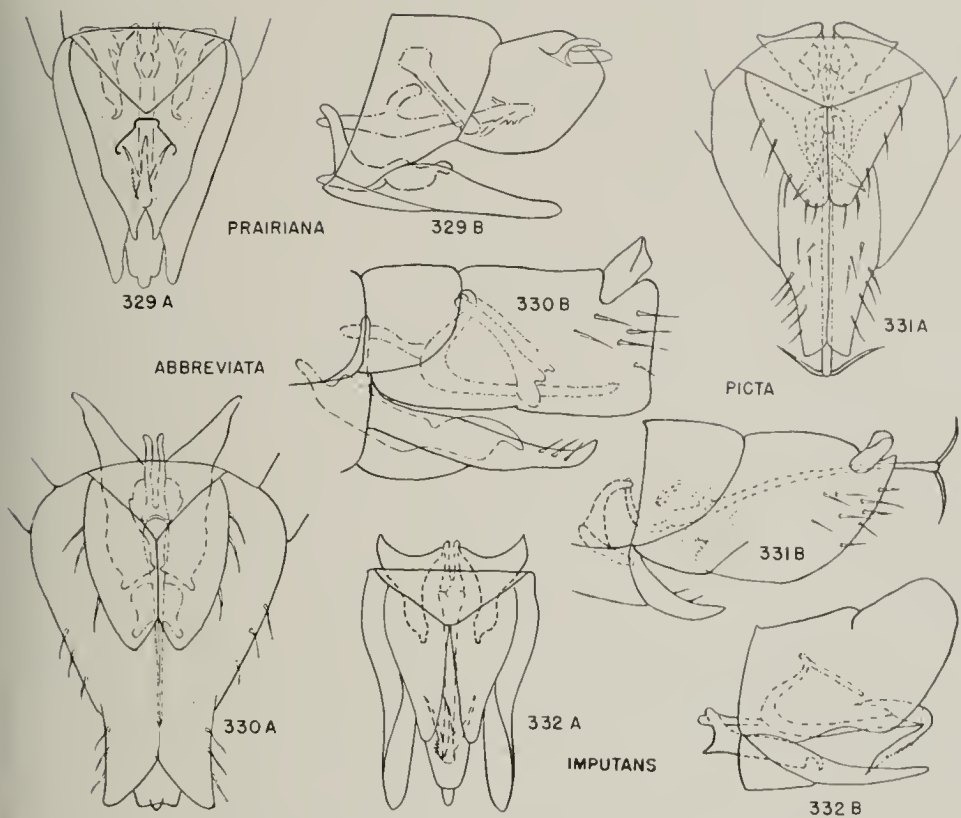


Fig. 328.—*Flexamia*, A-M, female genitalia.



Figs. 329-332.—*Flexamia*, male genitalia. A, ventral aspect; B, lateral aspect.

Posterior margin of seventh sternite broadly notched or concavely emarginate between lateral angles and median notch, as in fig. 328L . . . . . 18

18. Creamy yellow in color, face black . . . . . 13. *imputans*

Pale cinereus in color, face infuscated and with some pale markings . . . . . 19

19. Usually heavily marked with black or dark fuscous, nervures of veins heavily infuscated . . . . . 12. *picta*

Usually not heavily marked with black, nervures of elytra only moderately infuscated. 11. *prairiana*, 9. *bidentata*

1. *Flexamia rubranura* DeLong

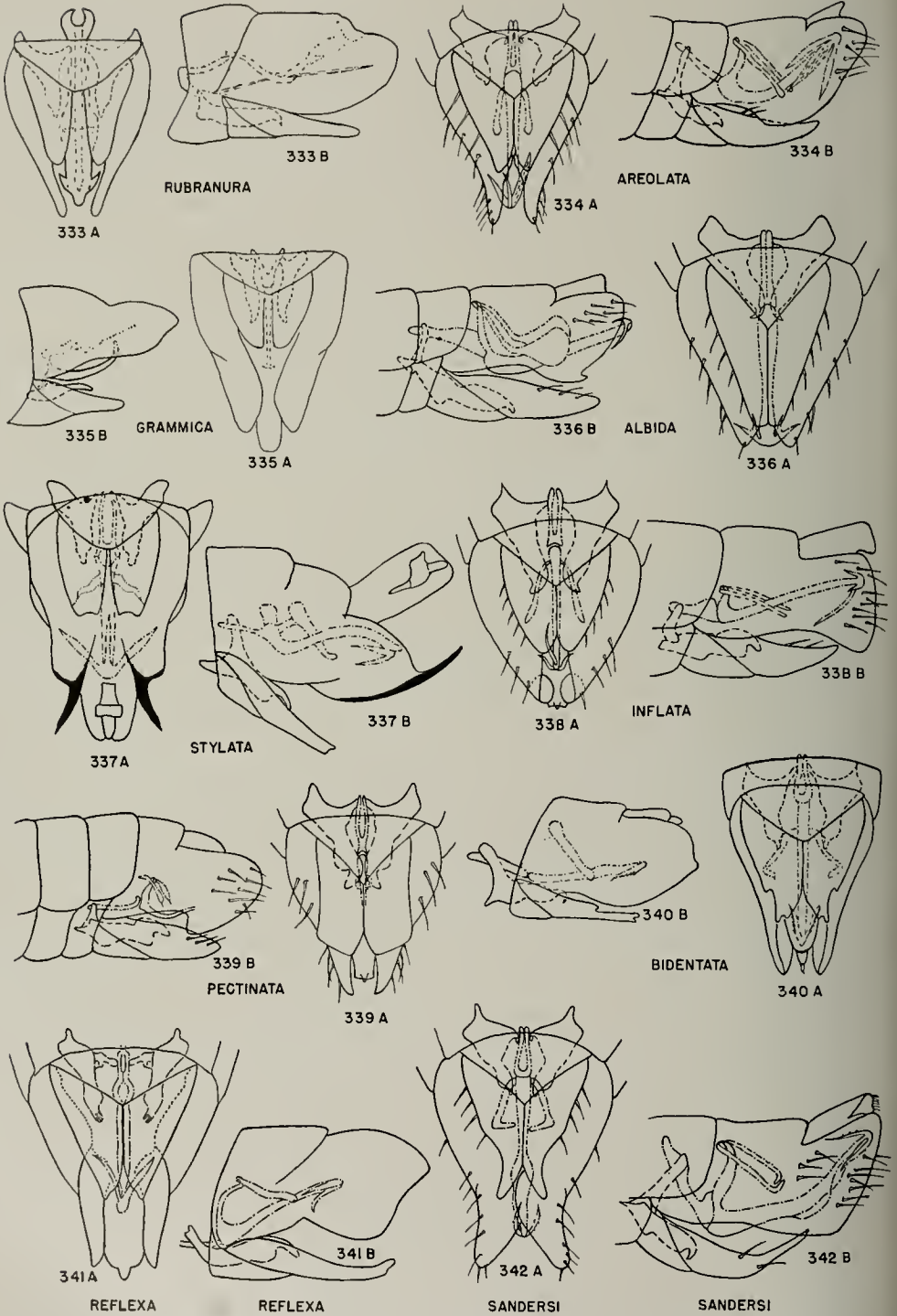
*Flexamia rubranura* DeLong (1935a, p. 154).

Length 3.0-3.2 mm. Yellowish, with heavy markings. Vertex, fig. 327A, one-third longer than width between eyes. Elytra short, covering only the first three or four abdominal segments. A broad black wedge-shaped mark composed largely of wide black transverse bars extending from apex of vertex to claval area of the elytra; a pair of black spots on pronotum behind

the eyes and two pairs at about the middle of the wings. Abdomen with four longitudinal black lines. Face and venter dark brown to black. Tips of male pygofer bright red.

Female seventh sternite, fig. 328A, almost truncate, middle third slightly produced and notched, forming a broad truncated or concavely rounded tooth on either side and with a black spot on either side of middle. Male plates gradually tapered to broadly rounded apices that are about one-half as wide as basal width, exceeded in length by the bright red pygofer. Aedeagus, fig. 333, with body short; a process arises on either side and extends into genital chamber; a ventral process arises from base, curves ventrally and caudally and lies between the terminals of the two dorsal branches; ventral process consists of two long slender parallel and proximal processes.

This species was described from northern Illinois, where it occurs on the moist prairies in at least two localities.



Figs. 333-342.—*Flexamia*, male genitalia; both internal and external structures shown. A, ventral aspect; B, lateral aspect.

**Illinois Records.**—EVERGREEN PARK: Aug. 23, 1934, DeLong & Ross, 24 ♂, 42 ♀; July 1, 1935, DeLong & Ross, 5 ♂. SUMMIT: July 17, 1935, DeLong & Ross, 12 ♂, 12 ♀.

## 2. *Flexamia areolata* (Ball)

*Deltocephalus areolatus* Ball (1899b, p. 188).

Length 3.5–4.0 mm. Pale olive to bright yellow. Vertex, fig. 327B, more than one-half longer at middle than width between the eyes, with crescent marks at apex enclosing a white spot. Elytra each with a large black or fuscous blotch between sectors and behind the first cross nervure, the outer apical margin and anterior borders of the broad white reflexed veins fuscous. Face and venter black.

Female seventh sternite, fig. 328B, with the posterior margin angularly excavated one-fourth the distance to base on either side of a rounded medially notched tooth, which is one-fourth the width of segment and equals the lateral angles in length. Male plates gradually narrowed to bluntly pointed divergent apices. Aedeagus, fig. 334, with three terminal processes, the two shorter processes smooth; longer process heavily clothed with coarse pubescence.

This species is a prairie type occurring on a *Panicum* or a closely related genus, which grows on sand prairies and in similar habitats. It is very common throughout the prairies of Illinois and is recorded from the eastern United States and west to Arizona.

**Illinois Records.**—Males and females, taken June 14 to October 4, are from Apple River Canyon State Park, Barry, Carman, Cave in Rock, Dixon Springs, Eichorn, Fulton, Hanover, Havana, Marshall, Oquawka, Oregon, Port Byron, St. Anne, Thomson, Urbana, Vienna, and Watson.

## 3. *Flexamia albida* (Osborn & Ball)

*Deltocephalus albidus* Osborn & Ball (1897, p. 201).

Length 4.25 mm. Milky white, with brown marking. Vertex, fig. 327C, a little longer at middle than basal width between eyes, a black or dark brown triangular margin enclosing pale spot at apex, a transverse band between eyes, and four or six longitudinal lines across pronotum, the inner pair arising on the base of vertex and extending across scutellum on to elytra. Elytra

with claval and apical margins, anterior borders of reflected veins, and spots on each clavus and disc, brown or black.

Female seventh sternite, fig. 328C, divided into three lobes by two angular excavations extending one-third the distance to base; central lobe almost as broad as the combined width of the other two, incised at middle, and with a slight blunt tooth on either side. Male plates gradually tapering to blunt convexly rounded apices. Aedeagus, fig. 336, with a pair of terminal processes, each branched near base and giving rise to two short ventrally or laterally directed spines.

A distinctly marked species, *albida* occurs only in prairie habitats in a few middle western states.

## 4. *Flexamia grammica* (Ball)

*Deltocephalus grammicus* Ball (1900b, p. 204).

Length 5.25 mm. Lemon yellow, marked with brown stripes. Vertex, fig. 327D, about one-fifth longer at middle than width between eyes; white, washed with yellow; fuscous crescent marks at apex, marginal line and a transverse medially interrupted band between ocelli also fuscous; a pair of dark brown longitudinal stripes arising on basal third of vertex and continuing across pronotum and scutellum. Pronotum with two additional lines behind each eye; four central lines continuing on to elytra, the two on each side converging and uniting before tip of clavus, where they terminate. Three other bands paler in color on each elytron interrupted by pale yellow veins. Face yellow, a black line just beneath margin of vertex.

Female seventh sternite, fig. 328D, with posterior margin angularly excavated one-third the distance to the base; margin of excavation near center slightly toothed and marked with black. Male plates short and broad, with broadly rounded apices. Aedeagus, fig. 335, slender with two very short laterally directed terminal processes; a short dorsal process arises at base and has a pair of longer processes at its apex.

An abundant species on the sand prairies in Illinois, *grammica* is one of the most striking in color of this genus. It has been recorded previously from Colorado and Nebraska.

**Illinois Records.**—FULTON: Aug. 22, 1935, DeLong & Ross, 5 ♂. THOMSON:

June 30, 1935, DeLong & Ross, 113 ♂, 101 ♀; Aug. 16, 1937, Ross & Burks, 1 ♂, 4 ♀.

### 5. *Flexamia stylata* (Ball)

*Deltocephalus stylatus* Ball (1899b, p. 190).

Length 4.5 mm. Pale cinereous. Vertex, fig. 327E, very slightly longer than its basal width, yellowish, with apical dark spots and with a transverse broken line between ocelli. Elytra marked as in *flexulosa* (Ball) (1899b, p. 199), nervures pale, margined with fuscous; outer region of each clavus with a dark spot on either side of first cross nervure of the disc.

Female seventh sternite, fig. 328E, with posterior margin produced on the middle third into an obtusely triangular tooth, bifid at apex and bearing a small lateral tooth on either side. Male plates, fig. 337, roundedly divergent at the apices, which are half as wide as at the bases; apices truncate or slightly and roundedly emarginate. Styles long, narrow, black, exceeding pygofer.

This prairie species has been collected only rarely, and very little is known of its food habits. It has been recorded from Iowa and Nebraska.

### 6. *Flexamia inflata* (Osborn & Ball)

*Deltocephalus inflatus* Osborn & Ball (1897, p. 202).

Length 3.0–4.5 mm. Yellowish to brownish. Vertex, fig. 327F, almost as wide between eyes as length at middle, similarly marked as in *stylata*. Pronotum and scutellum with longitudinal markings. Elytra with veins on each clavus, on the disc, and on apical portion of each elytron bordered with fuscous.

Female seventh sternite, fig. 328F, with posterior margin roundedly notched on either side of a central broad produced lobe, which is notched at center and bears a black spot and slight tooth on the sloping sides. Male plates, fig. 338, gradually and convexly rounded to appressed roundedly pointed apices, sometimes notched at apices by the sharp pygofer edges. Pygofers enlarged and inflated. Aedeagus with a pair of short lateral terminal processes and a long slender ventral process that is twice the length of the lateral.

This is one of the most common grass-feeding species in Illinois and occurs abun-

dantly in meadow, pasture, and prairie habitats.

It is distributed over the eastern United States and west to Colorado.

**Illinois Records.**—Many males and females, taken May 30 to September 20, are from Alsip, Amboy, Antioch, Barry, Beach, Des Plaines, Evergreen Park, Fulton, Homer, Kankakee, Macomb, McHenry, Oak Lawn, Odin, Ogden, Oquawka, Orangeville, Palos Park, Pike, Princeton, St. Anne, Shawneetown, Summit, Urbana, Vienna, Wauconda, and White Pines Forest State Park.

### 7. *Flexamia pectinata* (Osborn & Ball)

*Deltocephalus pectinatus* Osborn & Ball (1897, p. 205).

Length 3.5–4.0 mm. Dorsum pale cinereous. Vertex, fig. 327K, one-fourth longer than basal width between eyes, with the usual marks at apex and on disc for the more typical members of the genus. Elytra with nervures pale, margined with fuscous; apical and discal cells darker. Face dark above, shading to pale below.

Female seventh sternite, fig. 328G, with posterior margin slightly concave and bearing four black comblike teeth on the central third; inner pair rounded and close together and separated by a notch from the outer pointed pair. Male plates, fig. 339, broad, almost parallel margined and broadly rounded to blunt almost truncate tips. Ventral keels of pygofers exposed between the plates at their apices. Aedeagus simple, without terminal processes; very short curved basal portion extending anteriorly, with a pair of short dorsal processes.

This distinctive species occurs in a mixed association on the prairie and seems to live on *Bouteloua* grasses. It has been recorded from only the Middle West.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, Frison & DeLong, 3 ♂; Aug. 22, 1935, DeLong & Ross, 5 ♀. OGDEN: on prairie, July 1, 1934, DeLong & Ross, 1 ♀. WARREN: Aug. 28, 1934, Frison & DeLong, 1 ♀.

### 8. *Flexamia sandersi* (Osborn)

*Deltocephalus sandersi* Osborn (1907, p. 164).

Length 3.5 mm. Yellowish gray; vertex, fig. 327M, about one-third longer at middle than width between eyes at base, with the



pale tip enclosed in a darker circular or quadrate ring; margins with pale fuscous lines from apex to ocelli and with the usual transverse band and basal oblique marks. Nervures of elytra usually paler than surface; apical margin of each elytron and costal reflexed veins heavily bordered with dark fuscous.

Female seventh sternite, fig. 328I, with lateral margins rounding to median third of posterior margin, which is strongly produced into a broad tooth slightly incised at middle and black on either side. Male plates, fig. 342, broad at base, narrowed rapidly for two-thirds their length, then abruptly concave and strongly divergent, with acutely pointed apices. Aedeagus with two terminal anteriorly directed processes that are short and barbed.

This is another typical prairie species, which occurs on *Andropogon virginicus* and probably other species of the same genus. It is found in the eastern United States and west to Illinois.

**Illinois Records.**—ANVIL ROCK: Oct. 3, 1934, Frison & Ross, 1 ♀. CAVE IN ROCK: Oct. 3, 1934, Frison & Ross, 1 ♂, 1 ♀. DIXON SPRINGS: July 29, 1934, DeLong & Mohr, 1 ♀. EICHORN: Hicks Branch, June 13, 1934, DeLong & Ross, 2 ♂, 3 ♀. HIGH KNOB: Oct. 3, 1934, Frison & Ross, 1 ♀. LA RUE: July 11, 1934, DeLong & Ross, 1 ♀. SHAWNEETOWN: June 23, 1936, DeLong & Ross, 2 ♀. VIENNA: savanna grasses, June 14, 1934, DeLong & Ross, 3 ♂, 4 ♀; July 29, 1934, DeLong & Ross, 3 ♂, 4 ♀.

#### 9. *Flexamia bidentata* DeLong

*Flexamia bidentata* DeLong (1935a, p. 155).

Length 3.0–3.3 mm. Tawny, marked with brown. Vertex, fig. 327J, with the usual markings at apex and on disc. Veins of elytra heavily infuscated. Female seventh sternite, fig. 328M, with a large median tooth, which is bifid at apex, forming two sharp-pointed teeth. Male plates, fig. 340, similar to those of *visenda* (Crumb) (1915, p. 189) but broader at apices and more deeply notched on inner margins. Male pygofers without the broad conspicuous ventral flaps that overlap as in *visenda*. Male aedeagus with two terminal processes.

This species was described from Illinois and has been taken in two localities, both on the prairies.

**Illinois Records.**—ST. ANNE: Aug. 21, 1935, DeLong & Ross, 5 ♂, 10 ♀. ZION: June 25, 1934, Frison & DeLong, 2 ♂, 2 ♀; Aug. 7, 1935, Ross & DeLong, 5 ♂.

#### 10. *Flexamia reflexa* (Osborn & Ball)

*Deltocephalus reflexus* Osborn & Ball (1897, p. 203).

Length 4.0–4.5 mm. Pale cinereous, with dark markings. Vertex, fig. 327G, about one-fourth longer at middle than basal width between eyes; apex often ivory white, enclosed between crescent marks; marginal line to ocelli, transverse dashes before eyes, and oblique marks on base fuscous. Pronotum pale, with faint longitudinal stripes. Nervures of elytra margined with fuscous; spots on each clavus and on disc conspicuous; reflexed veins, apical margin of each elytron broadly bordered with fuscous.

Female seventh sternite, fig. 328J, with posterior margin almost truncate, central third roundedly and broadly produced into a tooth that is notched at center and has a large black spot on either side of notch. Male plates, fig. 341, long, rather narrow, and concavely and attenuately pointed. Aedeagus with three anteriorly directed terminal processes, one of which occurs on the dorsal side; the largest process with two spines on basal portion.

A common prairie species of the Middle West, *reflexa* has apparently been confused with other closely related species of *Flexamia*, thereby rendering many reports of its occurrence and abundance as unreliable.

**Illinois Record.**—OQUAWKA: sand prairie, July 30, 1936, Mohr & Burks, 1 ♀.

#### 11. *Flexamia prairiana* DeLong

*Flexamia prairiana* DeLong (1937a, p. 32).

Length 4.0–4.5 mm. Yellowish, closely resembling *reflexa*. Vertex about one-fifth longer at middle than basal width between eyes, with apical dark ring and cross band on disc. Elytra yellowish, veins bordered with brown, especially heavy along reflexed veins to each costa.

Female seventh sternite rather deeply emarginate on either side of the median produced third, which is rounded at apex and notched so as to form several minute teeth. Male plates, fig. 329, long, tapered to pointed apices, which are slightly divergent. Aedeagus bearing three anteriorly directed

processes as in *reflexa*, but differing by the absence of a process on the dorsal side and by having the large process on ventral side. In this species there is a finely serrate smaller lateral process.

This is a common species on sandy lake-bottom prairies and probably the most abundant species of this genus in the northern part of Illinois. It is known only from this state.

**Illinois Records.**—ALSIP: Aug. 23, 1934, DeLong & Ross, 11 ♂. EVERGREEN PARK: Aug. 23, 1934, DeLong & Ross, 41 ♂. SUMMIT: July 17, 1935, DeLong & Ross, 2 ♀. ZION: July 16, 1935, DeLong & Ross, 1 ♂.

## 12. *Flexamia picta* Osborn

*Deltocephalus pictus* Osborn (1907, p. 165).

Length 3 mm. Pale gray, vertex, fig. 327H, about one-fifth longer than width between eyes, a black circle at tip enclosing a pale spot; the usual marginal line, one or two transverse bands, and spots at base are present. Pronotum with prominent transverse band. Elytra with veins pale, usually heavily bordered with fuscous or black; central apical cell often entirely brown or black.

Female seventh sternite, fig. 328H, almost truncate, central third broadly and roundedly produced, two small incisions form a minute tooth at apex on either side of a median rounded lobe. Male plates, fig. 331, slightly and convexly rounded to blunt apexes. Pygofers more than twice as long as plates. Aedeagus with two slender laterally directed apical processes.

This species occurs in the eastern United States, especially on hillsides and in certain prairie types where *Aristida gracilis* and related species grow in abundance.

**Illinois Records.**—Males and females, taken June 12 to October 3, are from Adair, Albion, Alton, Amboy, Anvil Rock, Barry, Cave in Rock, Dixon Springs, Dongola, Fairfield, Galeoa, Geff, Harrisburg, Kampsville, Marshall, Metropolis, Parker, Pike, Shawneetown, Vienna, and Watson.

## 13. *Flexamia imputans* (Osborn & Ball)

*Deltocephalus imputans* Osborn & Ball (1898, p. 75).

Length 3.5–4.0 mm. Creamy yellow, tinged with olive. Vertex, fig. 327I, about one-third longer at middle than width be-

tween eyes, a black spot on either side of pale apex. Reflexed veins of elytra broadly white, margined anteriorly with fuscous; outer apical cell of each elytron with the posterior margin fuscous. Face black, venter infuscated.

Female seventh sternite, fig. 328L, with emargination posteriorly on either side of a central broadly produced lobe that is angular and somewhat incised at center and has a black spot on either side. Male plates, fig. 332, gradually narrowed to rounded divergent tips.

This species has been recorded from Kansas, Iowa, and Wisconsin, and is found on *Muhlenbergia* growing in sheltered situations.

## 14. *Flexamia abbreviata* (Osborn & Ball)

*Deltocephalus abbreviatus* Osborn & Ball (1897, p. 206).

Length 3.0–3.25 mm. Pale, cinereous, with vertex markings nearly as in *reflexa*. Vertex, fig. 327L, at least one-third longer at middle than basal width between the eyes. Elytra with almost all the veins dark margined, reflexed veins and apical margin of each more heavily marked. Entire face infuscated.

Female seventh sternite, fig. 328K, with posterior margin excavated on either side of the central fourth, which is abruptly produced one-third the length of the segment, truncated, incised at middle, and slightly arcuate on either side, forming four rather distinct teeth. Male plates, fig. 330, convexly rounded from bases and slightly rounded from inner margins near tips to bluntly pointed apexes. Pygofers narrow, greatly exceeding plates. Aedeagus curved, rather long, without apical processes; anterior dorsally curved portion bearing a bifurcate dorsal process with rather long ventrally directed arms.

Another of the prairie species, *abbreviata* occurs along with *pectinata* in the *Bouteloua hirsuta* association. It is recorded only from the Middle West and Texas.

**Illinois Record.**—THOMSON: July 8, 1934, DeLong & Ross, 21 ♂, 39 ♀.

## 52. *LATULUS* DeLong & Slesman

*Latulus* DeLong & Slesman (1929, p. 87).

Fig. 222. Vertex angularly produced, but usually not greatly longer than width be-

tween eyes. Reflexed arcs of front not visible from above. Elytra with short veinlets meeting each costa at about right angles but with no reflexed veins to costa; elytra usually short, just covering abdomen.

The species of this genus are typically wet meadow forms and with few exceptions occur in that habitat. Several are found at high mountain elevations. Eleven species are known for the United States, of which two have been collected in Illinois; two others may occur here.

KEY TO SPECIES

1. Color gray to dull green; length 4.0 mm. or more. Female seventh sternite, fig. 343, with a pair of median produced teeth. Male plates, fig. 344, shorter than combined basal width, apices obliquely sloping . . . . . **1. configuratus**  
Color some shade of brown; length not exceeding 3.5 mm. Female seventh sternite without median teeth. Male plates longer than combined basal width . . . . . 2
2. Female seventh sternite, fig. 343, deeply notched at either side, forming a broad median tooth. Male plates, fig. 344, divergent at apices, sloping to outer margins . . . . . **2. latidens**  
Female seventh sternite entire, not deeply notched. Male plates not divergent at apices . . . . . 3
3. Female seventh sternite, fig. 343, concave. Male plates, fig. 344, sloping to inner pointed appressed apices . . . . . **3. sayi**  
Female seventh sternite, fig. 343, rounded. Male plates, fig. 344, broader at rounded apices, not pointed on inner margins . . . . . **4. missellus**

1. *Latulus configuratus* (Uhler)

*Deltocephalus configuratus* Uhler (1879, p. 511).

Length 4.0-4.5 mm. Gray to dull greenish. Vertex, fig. 343, flat, bluntly angled, wider between eyes than length at middle, marked with a white cross and with the margin pale. Pronotum usually marked by longitudinal bands. Nervures of elytra paler than adjacent areas, faintly margined with fuscous. Face pale fuscous.

Female seventh sternite, fig. 343, black on central half with the posterior margin concavely rounded on either side of a rather long pointed median tooth, which is usually bifid. Male plates, fig. 344, gradually sloping along outer margins; inner margins suddenly diverging at two-thirds their length and rounded to outer blunt apices. Aedeagus short, apical fifth bifid.

This species has a northern range throughout Canada and the northern portion of the United States. It is common on *Poa compressa* and may occur in northern Illinois.

2. *Latulus latidens* (Sanders & DeLong)

*Deltocephalus latidens* Sanders & DeLong (1919, p. 234).

Length 3 mm. The size, form, and appearance as for *missellus*, but distinguished

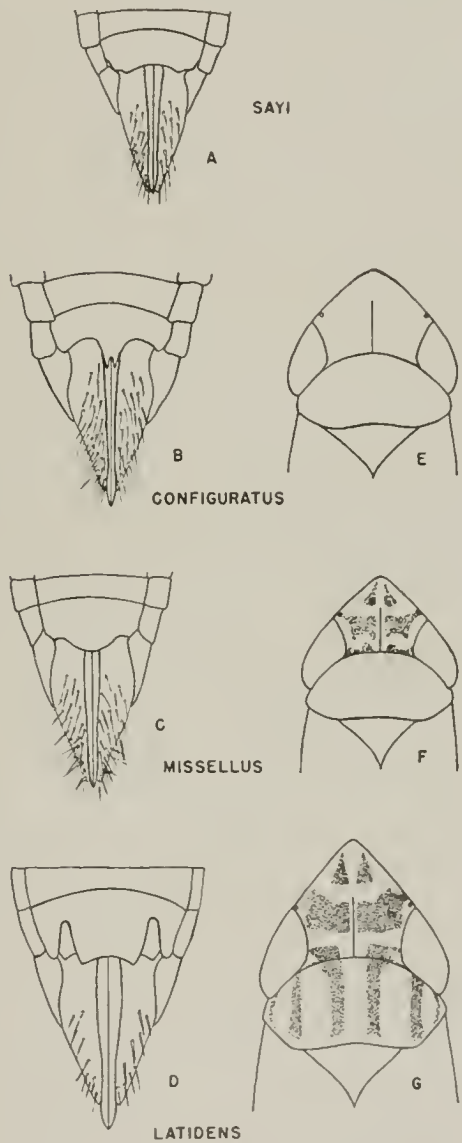


Fig. 343.—*Latulus*. A-D, female genitalia; E-G, heads and pronota.

by the external genital characters. Female seventh sternite, fig. 343, more than twice as long as preceding sternite, posterior margin deeply and roundedly incised near lateral margins for two-thirds the distance to base, leaving a broad central truncated tooth; tooth one-half the width of entire segment and produced beyond the lateral angles, the latter appearing as long, narrow, spatulate processes. Male plates, fig. 344, long, strongly divergent, inner margins curving to form bluntly pointed outer margins.

This species has been recorded only from Wisconsin and occurs in wet meadows and pastures.

### 3. *Latulus sayi* (Fitch)

*Amblycephalus sayi* Fitch (1851, p. 61).

Length 3.5 mm. Yellowish to brownish, with banded elytra. Vertex longer at middle than width between eyes, with four fuscous spots arranged in two somewhat concentric rows about the apex; anterior spots triangular, the posterior pair somewhat irregular in shape. Elytra each with two transverse pale bands, one at base and another just posterior to the middle; nervures of bands usually milky white.

Female seventh sternite, fig. 343, with posterior margin shallowly, concavely, and

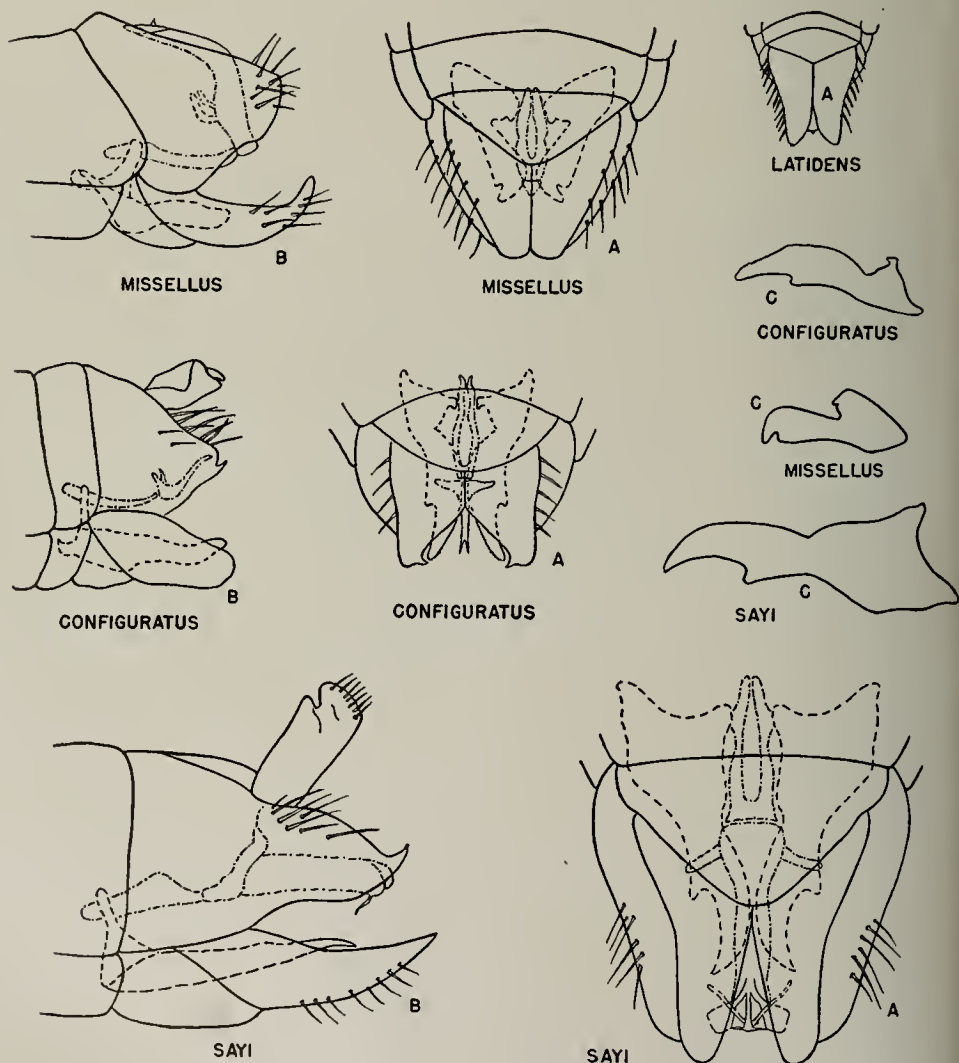


Fig. 344.—*Latulus*, male genitalia. A, ventral aspect; B, lateral aspect; C, style.

often sinuately rounded. Male plates, fig. 344, with outer margins slightly and concavely narrowed to near apexes, where they are suddenly convexly rounded to the inner blunt apexes. Aedeagus with two short lateral processes arising dorsally at base; apical portion broadened into winglike structures between which a pair of long slender processes arise and extend ventrally and anteriorly.

This is a common meadow and pasture species occurring upon bluegrass and probably other common grasses in these areas. It has a wide range over the eastern and middle western states.

**Illinois Records.**—Many males and females, taken from May 3 to November 13, are from Aldridge, Algonquin, Apple River Canyon State Park, Aurora, Browns, Cave in Rock, Decatur, Des Plaines, Dixon, Dolson, Dubois, East St. Louis, Eichorn, Elgin, Elizabethtown, Evergreen Park, Fern Cliff, Galena, Geff, Grand Detour, Hardin, Havana, Herod, Homer, Kankakee, Lima, Mahomet, Makanda, Marshall, Monticello, Muncie, Newton, Oakwood, Odin, Oregon, Palos Park, Princeton, Rago, Rock Island, St. Joseph, Seymour, Shawneetown, Thebes, Urbana, Vandalia, Vienna, Volo, Warren, Watson, White Heath, and White Pines Forest State Park.

4. *Latulus missellus* (Ball)

*Deltocephalus missellus* Ball (1899b, p. 191).

Length 2.75–3.0 mm. Brownish, resembling *sayi* in general appearance but without distinct banding of the elytra. Vertex, fig. 343F, about as long as wide, pale, with the four brownish spots, as in *sayi*, separated by a white cross, and often with two other irregular spots near base. Elytra pale cinereous; nervures pale, irregularly margined with fuscous.

Female seventh sternite, fig. 343C, with the middle half of posterior margin convexly rounded, on either side of which it is shallowly concave to the lateral angles. Male plates, fig. 344, broad at bases, gradually narrowed to bluntly rounded and slightly divergent apexes. Aedeagus with a pair of spinelike structures near the base; apex of dorsal portion pointed.

Distributed from Maine to Utah in the northern region of the United States, *missellus* occurs on grasses in meadows, open woodland, and pastures.

**Illinois Records.**—Many males and females, taken June 10 to October 7, are from Amboy, Antioch, Apple River Canyon State Park, Beach, Byron, Des Plaines, Duncans Mills, Elizabeth, Evergreen Park, Fox Lake, Galena, Grand Detour, Grays Lake, Hanover, Herod, Lima, New Milford, Oregon, Palos Park, St. Anne, Savanna, Volo, White Pines Forest State Park, and Zion.

53. *PALUS* DeLong & Slesman

*Palus* DeLong & Slesman (1929, p. 85).

Fig. 221. Vertex variable in length and angle, margin not sharply defined. Elytra each with a definite but small appendix, with central antepical cell constricted at center but not divided, outer antepical cell quite small, sometimes almost obsolete; two or three costal veinlets slightly reflexed. Illinois species with dark spot inside posterior angle of inner apical cell.

The coloration and the form of the head vary decidedly among the species of this genus, but the genitalia are quite uniform. Leafhoppers of this genus live in marsh habitats or in very humid swampy woods. Seven species are recorded for the United States, and one of these has been taken in Illinois. Several others may occur in this state.

KEY TO SPECIES

1. Vertex ivory white, tinted with yellow, without dark markings, fig. 346B . . . . . 1. *luteocephalus*  
Vertex, pronotum, and scutellum with dark longitudinal stripes . . . . . 2
2. Vertex sharply angled, longer at middle than width between eyes, fig. 345B; length not exceeding 3.5 mm. . . . . 2. *delector*  
Vertex more bluntly angled, width and length nearly equal, fig. 347B; length 4.0 mm. or more . . . . . 3. *marginatus*

1. *Palus luteocephalus* (Sanders & DeLong)

*Deltocephalus luteocephalus* Sanders & DeLong (1917, p. 84).

Length 3.5–4.0 mm. Vertex, fig. 346B, a little wider than median length, white to pale yellow, with a median black line on basal two-thirds. Anterior margin of pronotum ivory white, darker posteriorly. Scutellum yellow. Face pale yellow, immaculate, antennal pits black. Elytra smoky subhyaline; claval, discal, and apical cells

darker; costal reflexed veins and apical margin of each heavily bordered with fuscous; nervures conspicuously pale, narrowly margined with fuscous.

Female seventh sternite, fig. 346A, with posterior margin slightly and concavely excavated to a broad median U-shaped notch that has a slight incision at the center; a black spot on either side of notch. Male plates gradually narrowed to bluntly rounded apexes.

A marsh-inhabiting species occurring only in small numbers in this habitat, *luteocephalus* is recorded from Wisconsin and South Dakota. It has not yet been taken in Illinois.

## 2. *Palus delector* (Sanders & DeLong)

*Deltocephalus delector* Sanders & DeLong (1919, p. 233).

Length 3.0–3.5 mm. Vertex, fig. 345B, pointed, one-fourth longer at middle than width between eyes; creamy white, with two broad tawny bands extending from base to apex, where they converge and form two black triangular spots, one on either side of white apex, and extend over the margin; a narrow black curved line extending from eye around ocellus on margin toward apex. Pronotum whitish, with four longitudinal tawny bands: one behind each eye, and a central pair, the extension of the bands on vertex; bands continuing across scutellum. Elytra tawny, with costal, sutural, and apical margins and veins white. Each elytron with a spot on inner apical cell, reflexed veinlets, and posterior white margin black bordered.

Female seventh sternite, fig. 345A, with the posterior margin sinuately sloping to form a broad shallow median notch slightly indented at center, on either side of which is a round black spot. Male plates, fig. 345C, gradually sloping to broad subtruncate apices, inner apical third of each black, white margined. Male internal genitalia as in fig. 345D.

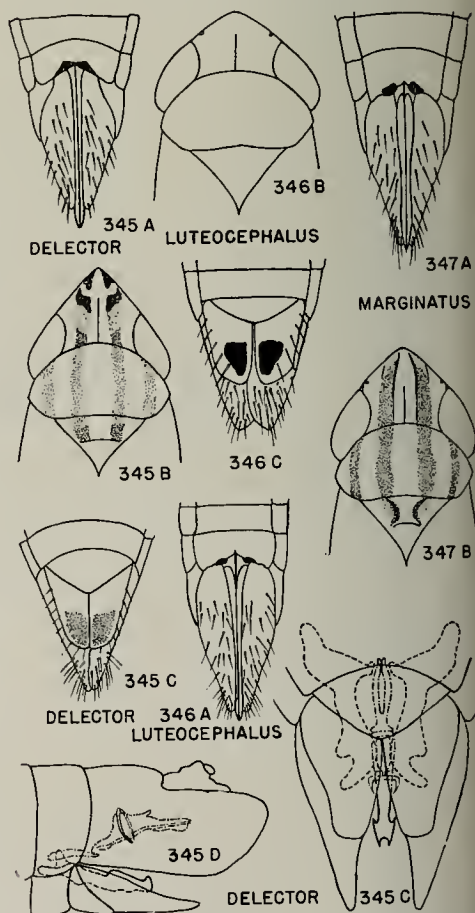
This species occurs on herbaceous plants in woodland areas and seems to be restricted to that association. It is found in the eastern part of the United States, ranging from Illinois to Maine.

**Illinois Records.**—OREGON: Castle Rock, June 30, 1935, DeLong & Ross, 5 ♂. WHITE PINES FOREST STATE PARK: June 30, 1935, DeLong & Ross, 5 ♂, 1 ♀.

## 3. *Palus marginatus* (DeLong)

*Deltocephalus marginatus* DeLong (1918a, p. 228).

Length 4 mm. Pale, with two longitudinal stripes. Vertex, fig. 347B, as long as basal width between eyes; two pale testaceous bands extending from apex of vertex to disc of scutellum, where they end in black spots, each band bordered interiorly by black broken lines that converge at apex; a black transverse band extending across margin of vertex and recurving on to vertex near eyes at each end. Pronotum with four longitudinal bands. Elytra pale testaceous, nervures white, heavily margined with fuscous along each claval margin and on apical portion; reflexed veinlets, posterior margins, and inner apical cells heavily marked.



Figs. 345–347.—*Palus*. A, female genitalia; B, head and pronotum; C, ventral aspect of male genitalia; D, lateral aspect of male genitalia.

Female seventh sternite, fig. 347A, with posterior margin sloping to a rather broad shallow U-shaped notch, slightly incised at center, a large oval black spot on each side of notch. Male unknown.

This is a fresh-water marsh species recorded from Maine, Wisconsin, and North Dakota. It occurs on either tall grasses or sedges.

54. *POLYAMIA* DeLong

*Polyamia* DeLong (1926a, p. 46).

Figs. 226, 348. Vertex rather short, bluntly angled, disc slightly convex or sloping forward, and thickly, rather bluntly

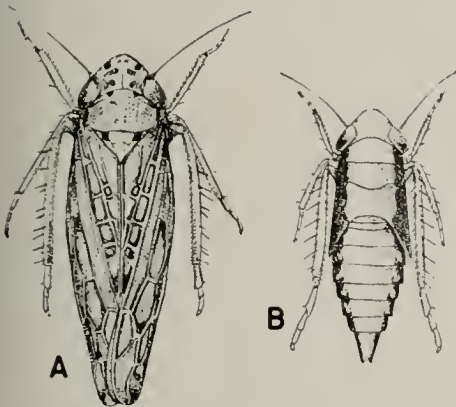


Fig. 348.—*Polyamia inimica*: A, adult; B, nymph. (From Osborn.)

angled with front. Elytra each with outer clavus strongly reticulate veined, central anteapical cell constricted and divided.

With few exceptions the species of the genus are grass feeders and frequent meadows, pastures, and prairies. Several seem to be quite restricted in food plant and habitat. About 35 species have been recorded for the United States, approximately half of which are known to occur in Illinois.

KEY TO SPECIES

1. Vertex with one or two narrow lines of recurved arcs which extend from front and are definitely visible on the dorsal curved margin of vertex, as in fig. 349A . . . . . 2
- Vertex often showing a heavy black coloring on either side of apex distinct from coloration of face, but usually without definite recurved narrow lines on margin of vertex, as in fig. 349C . . . . . 6

2. Females . . . . . 5
- Males . . . . . 3
3. Aedeagus, fig. 362, long, tapered to narrow tubular apex . . . . . 1. *obtecta*  
Aedeagus enlarged at apex, or apical portion broader than body of aedeagus, as in figs. 356, 357 . . . . . 4
4. Aedeagus, fig. 357, with a circular apical enlargement notched on anterior dorsal border . . . . . 2. *rossi*  
Aedeagus, fig. 356, with a broad rather short terminal portion bearing a curved dorsal spur, and gradually narrowed apically to a blunt tip . . . . . 3. *similaris*
5. Posterior margin of seventh sternite, fig. 349X, rather broad, only slightly indented, forming three rather broad rounded lobes . . . . . 2. *rossi*  
Posterior margin narrower, indentations deeper and closer together, forming a more narrow bluntly and angularly produced lobe at center, lateral lobes narrower, figs. 349M, 349V . . . . . 1. *obtecta*, 3. *similaris*
6. Vertex not marked with definite spots or bands . . . . . 7  
Vertex marked with spots or transverse bands or both . . . . . 8
7. Entire insect pale yellowish, unmarked; elytra short, covering only first four or five segments . . . . . 4. *brevipennis*  
Vertex yellowish; elytra chestnut brown, with pale veins, apex broadly white . . . . . 5. *apicata*
8. A pair of large round black spots on anterior margins of vertex, on pronotum, and on basal angles of scutellum, fig. 349C . . . . . 6. *inimica*  
Without three pairs of black spots arranged on anterior margin of vertex, on pronotum, and on scutellum . . . . . 9
9. Vertex with a transverse fuscous band, broken at middle, or a transverse spot either side resembling an interrupted band . . . . . 10  
Vertex without interrupted transverse band or transverse spots . . . . . 15
10. Vertex angularly produced, longer at middle than width between eyes . . . . . 11  
Vertex not longer at middle than width between eyes . . . . . 13
11. Transverse band orange or tawny; vertex, fig. 349D; sharply pointed, one-fourth longer than wide; elytra heavily marked with fuscous, appearing obliquely handed . . . . . 7. *arundinea*  
Transverse band fuscous or brown; vertex more bluntly angled; elytra mottled, not appearing banded . . . . . 12
12. Robust, 3.5 mm. in length; male plates, fig. 350, longer than pygofers, longer than combined basal width; female seventh sternite as in fig. 349R . . . . . 8. *interrupta*  
More slender, not exceeding 3.0 mm. in length; male plates, fig. 360A, not exceeding pygofers, less than combined basal width; female seventh sternite as in fig. 349S . . . . . 9. *herbida*
13. Female seventh sternite, fig. 349P, entire, broadly and concavely excavated; male

plates, fig. 351, short, broad, apex blunt.....10. *weedi*  
 Female seventh sternite with very short

lateral margins exposing lobes of underlying segments at lateral angles, as in figs. 349Q, 349U. Male plates longer,

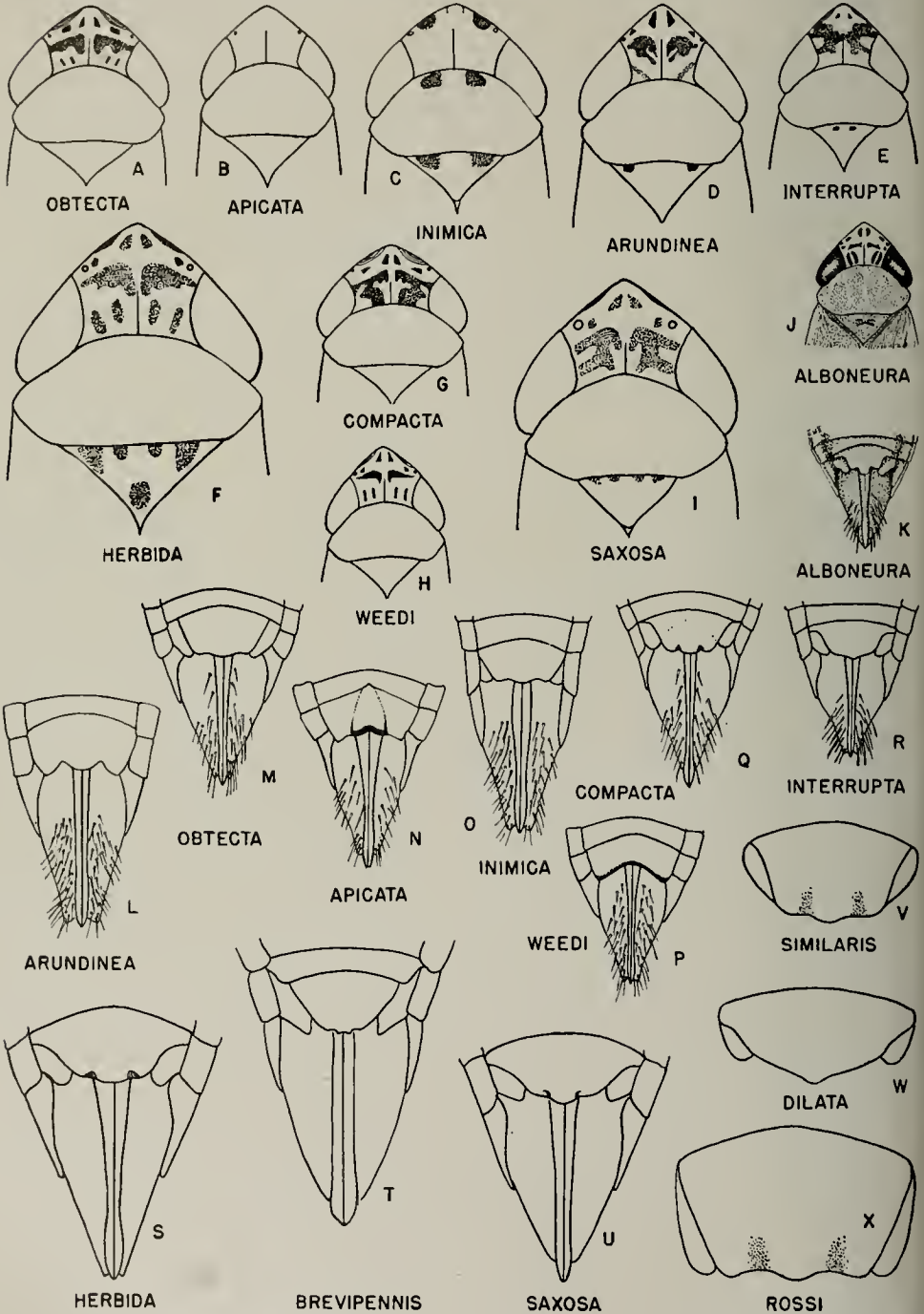


Fig. 349.—*Polyamia*. A-J, heads and thoraxes; K-X, female genitalia.



- concavely rounded to acute apices, as in figs. 355, 359*A* . . . . . 14
14. Median spots on apex of vertex, fig. 349*G*, conspicuous, band dark in color; male plates, fig. 355, longer than combined basal width; female seventh sternite as in fig. 349*Q*. . . . . 11. **compacta**  
 Median spots of apex of vertex, fig. 349*I*, usually wanting, band faint; male plates, fig. 359, about as long as basal width; female seventh sternite as in fig. 349*U*. . . . . 12. **saxosa**
15. Length 3.5 mm.; elytra heavily infuscated, appearing obliquely banded . . . . . 7. **arundinea**  
 Length less than 3.0 mm.; elytra mottled, not appearing banded. . . . . 16
16. Vertex, fig. 349*J*, with a distinct row of black spots above margin. . . . . 13. **alboneura**  
 Spots above margin of vertex faint, the middle spots often wanting . . . . . 17
17. Yellowish, with four large faint black spots above margin; elytra infuscated. . . . . 4. **brevipennis**  
 Pale brownish, a small round black spot next to each ocellus, a pair of faint triangular orange spots at apex of vertex separated by white lines. Veins of elytra broadly white, heavily margined with brown. . . . . 14. **dilata**

1. *Polyamia obtecta* (Osborn & Ball)

*Deltocephalus obtectus* Osborn & Ball (1898, p. 78).

Length 3.0-3.5 mm. White to gray, marked with black and fuscous. Vertex, fig. 349*A*, almost one-fourth wider between eyes than median length, and whitish in color except following black or fuscous marks: reflexed arcs of face, a pair of spots just back of apex, another either side midway to eye, an irregular interrupted band, broadest at middle, between anterior margins of eyes, and an indefinite spot on either side behind band. Scutellum with a large black spot in each basal angle. Elytra with nervures broadly whitish, the cells darker, and the nervures bordered with fuscous.

Female seventh sternite, fig. 349*M*, appearing to arise abruptly from the preceding segment, not touching the pleura, produced more than twice the length of preceding segment to a truncated posterior margin; lateral lobes produced beyond median portion as rounded lobes. Male plates, fig. 362, triangular, broad at base, strongly and concavely narrowed to produced attenuated tips that are much shorter than pygofer. Aedeagus long, in lateral view appearing broadened at middle, bent caudally, and tapered to a narrow bent apex.

This is a common grass species in the eastern United States and Middle West in open grassy areas and upon the prairie.

**Illinois Records.**—Many males and females, taken June 13 to October 1, are from Alton, Billett, Dixon Springs, Eichorn, Fern Cliff, Fulton, Galena, Grand Detour, Hauerover, Havana, Kankakee, Marshall, Oquawka, Oregon, St. Anne, Thomson, Vienna, and Watson.

2. *Polyamia rossi* DeLong

*Polyamia rossi* DeLong (1937*a*, p. 32).

Length 3 mm. Gray, marked with black, closely resembling *obtecta*. Vertex bluntly angled, as long at middle as basal width between eyes, with a pair of proximal pale spots, a darker spot next to either eye, and a black transverse band, which is broken at middle, between anterior margins of eyes. Thorax pale brownish, a black spot just back of each eye. Elytra white, veins bordered with brown; brown spots on middle of each clavus and disc of elytra.

Female seventh sternite, fig. 349*X*, with side margins sloping to posterior margin, which is almost truncate and dark margined; side lobes of underlying membrane conspicuous. Male plates, fig. 357, triangular, apexes rather long, tapered to acute tips. Aedeagus in lateral view long, slender on basal two-thirds, then abruptly and greatly enlarged, the ventral portion broadly curved, semicircular, with a short apical process extending dorsally and anteriorly, and a basal dorsally directed spur.

This is a rather abundant species on grasses on the sand prairie in Illinois. It is known only from this state.

**Illinois Records.**—AMERICA: July 16, 1937, 1 ♀. FULTON: Aug. 22, 1935, DeLong & Ross, 26 ♂, 17 ♀. THOMSON: July 4, 1936, 2 ♀; Aug. 16, 1937, 1 ♂.

3. *Polyamia similaris* DeLong & Davidson

*Polyamia similaris* DeLong & Davidson (1935, p. 164).

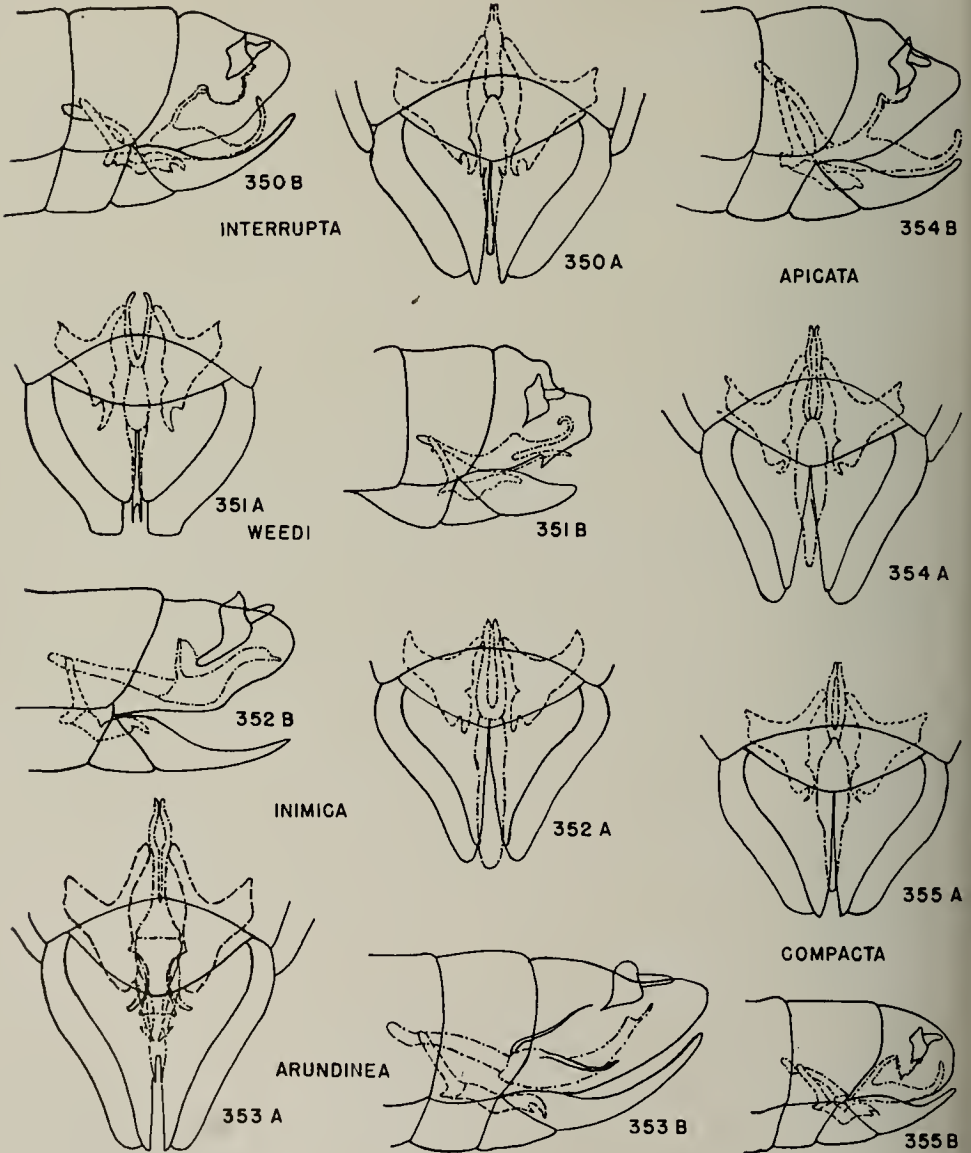
Length 3 mm. Gray, with dark markings, resembling *obtecta* in general appearance. Vertex bluntly angled, slightly wider between eyes than length at middle, with recurved arcs on either side of apex; a pair of proximal brown to black spots at apex, and one spot next to each ocellus, a broken

band between anterior margins of the eyes, and oblique markings either side on basal portion. Mottling on anterior margin of pronotum brown. Veins of elytra rather heavily infuscated.

Female seventh sternite, fig. 349I', produced rather abruptly on posterior margin, which is trilobate; central lobe slightly broader and not quite as long as the lateral lobes; lateral lobes of underlying membrane

conspicuous at sides of seventh sternite. Male plates, fig. 356, broad at base, short, triangular, one-third wider at base than long. Male aedeagus in normal position curved dorsally and with a dorsal curved finger-like spur.

This species is apparently southern in its distribution and has been taken in large numbers from grasses in southern Illinois. It resembles *obtecta* and *compacta* closely



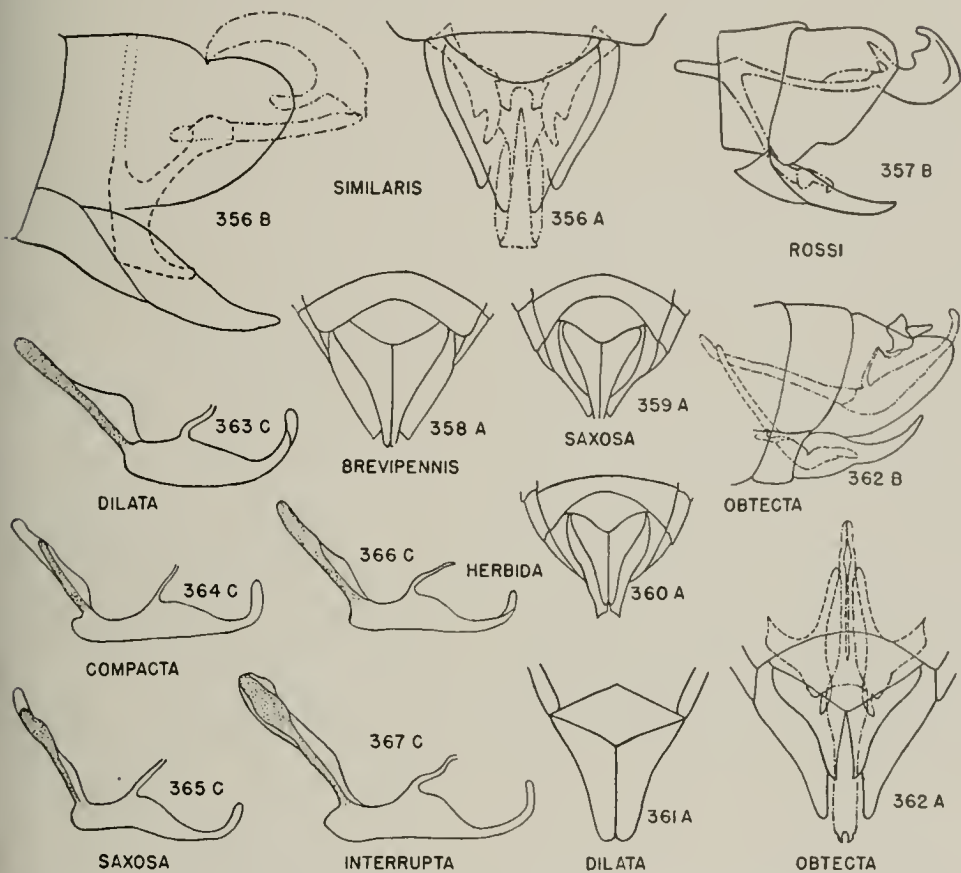
Figs. 350-355.—*Polyamia*, male genitalia. A, ventral aspect; B, lateral aspect.

and has apparently been confused with them previously.

**Illinois Records.**—Males and females, taken June 10 to October 3, are from Cave

spots on anterior margin of pronotum, veins of elytra heavily infuscated.

Female seventh sternite, fig. 349T, with short lateral margins; posterior margin con-



Figs. 356-367.—*Polyamia*, male genitalia. A, ventral aspect; B, lateral aspect; C, aedeagus.

in Rock, Dixon Springs, Eichorn, Fairfield, Galena, Hanover, Havana, Herod, High Knob, Luther, Marshall, Oquawka, St. Anne, Shawneetown, Vienna, and Watson.

4. *Polyamia brevipennis* DeLong & Davidson

*Polyamia brevipennis* DeLong & Davidson (1935, p. 164).

Length 2.0-2.5 mm. Yellowish, short-winged; vertex frequently unmarked, bluntly angled, a little longer at middle than basal width between eyes; ocelli black; dark specimens with four large faint brownish

vexly rounded, with a slight notch on either side; lateral portions of underlying membrane conspicuously produced as lobes at either side. Male plates, fig. 358A, triangularly elongate, longer than combined basal width.

This species has been taken in a prairie habitat and also in moist open wooded areas in southern Illinois. It was previously recorded from Alabama.

**Illinois Records.**—CAVE IN ROCK: July 9, 1935, DeLong & Ross, 1 ♀. DIXON SPRINGS: July 9, 1935, DeLong & Ross, 2 ♂, 3 ♀. ELIZABETHTOWN: July 8, 1935, DeLong & Ross, 1 ♂.

### 5. *Polyamia apicata* (Osborn)

*Deltocephalus apicatus* Osborn (1900*b*, p. 285).

Length 3 mm. Brown, with the head, anterior portion of pronotum, and caudal end of body pale yellow. Vertex, fig. 349*B*, bluntly angled, as long at middle as basal width between eyes; posterior portion of pronotum shading to brown; face often slightly darker than dorsal light areas of body; scutellum and elytra to apical transverse veins reddish brown, the nervures yellowish, apical cells yellowish hyaline.

Female seventh sternite, fig. 349*N*, very short at side margins, then abruptly produced, and semicircularly rounded, posterior margin bisinuate, with a brown spot on either side of middle producing trilobate appearance; underlying membrane deeply and concavely rounded, the only visible portions being the outer rounded lateral angles. Male plates, fig. 354, broad at bases, concavely rounded to narrow tips, which are produced almost the length of pygofers.

This is a very common prairie species in the eastern states and occurs on sandy areas and sand prairies on *Panicum villosissimum* and probably other species of this genus.

**Illinois Records.**—Males and females, taken June 12 to October 2, are from Apple River Canyon State Park, Beach, Cave in Rock, Dongola, Fern Cliff, Fulton, Galena, Geff, Grand Detour, Hanover, Harrisburg, Oquawka, St. Anne, Shawneetown, Thomson, Vienna, and Zion.

### 6. *Polyamia inimica* (Say)

*Jassus inimicus* Say (1831, p. 305).

*Jassus 6-punctatus* Provancher (1872, p. 378).

Length 4 mm. Grayish yellow, with a pair of black spots on vertex, pronotum, and scutellum; vertex, fig. 349*C*, bluntly angled, one-fourth wider between eyes than median length, a pair of minute spots at apex in addition to the pair of larger spots. Two large black spots on anterior margin of pronotum and one in each basal angle of scutellum. Elytra grayish, nervures broadly white, cells margined with fuscous.

Female seventh sternite, fig. 349*O*, short at lateral margins, then produced to posterior margin, which is trilobate; underlying membrane with prominent lateral angles. Male plates, fig. 352, concavely narrowed to pointed apices.

This is one of the most common species of North American leafhoppers, and is transcontinental in distribution. It is found abundantly in all types of vegetation, especially on grasses, both native and cultivated species.

**Illinois Records.**—Many males and females, taken May 8 to October 20, are from Aldridge, Algonquin, Alton, Amboy, Anna, Antioch, Anvil Rock, Apple River Canyon State Park, Atlas, Aurora, Barry, Beach, Bradley, Buckley, Bushnell, Cairo, Carman, Cave in Rock, Centralia, Champaign, Cornfield, Decatur, Des Plaines, Dixon Springs, Dolson, Dongola, Dubois, Duncans Mills, Eichorn, Elgin, Elizabeth, Elizabethtown, Evergreen Park, Fairfield, Forrest, Fox Lake, Fulton, Galena, Geff, Golconda, Grafton, Grand Detour, Grays Lake, Hardin, Harrisburg, Havana, Hillsboro, Ingleside, Justice, Kampsville, Kankakee, Keithsburg, Kirkwood, Lake Villa, Marshall, Mason City, Meredosia, Mokena, Momence, Monmouth, Monticello, Mount Carmel, Muncie, New Holland, Niota, Normal, Oak Lawn, Oakwood, Ogden, Onarga, Palos Park, Pecatonica, Pegrim, Plainview, Princeton, Putnam, Quincy, Rock Island, Round Lake, St. Anne, St. Joseph, Savanna, Seymour, Shawneetown, Sheffield, Sparta, Springfield, Starved Rock State Park, Summit, Taylorville, Thomashoro, Thomson, Tremont, Urbana, Ursa, Vandalia, Vienna, Virginia, Volo, Watson, Wilmington, White Heath, White Pines Forest State Park, and Zion.

### 7. *Polyamia arundinea* (Crumb)

*Deltocephalus arundineus* Crumb (1915, p. 191).

Length 3.5 mm. Pale creamy, with black spots on vertex, pronotum, and scutellum and a cross on each elytron. Vertex, fig. 349*D*, almost one-fourth longer at middle than width between eyes; a pair of triangular spots near apex, and a spot each side midway to eye black; a pair of large irregular fuscous spots forming a somewhat broken band between anterior margins of eyes; a pair of oblique fuscous dashes at base. Pronotum with indistinct pale longitudinal bands and a black spot behind each eye. Basal angles of scutellum and apex each with a black spot. Elytra fuscous, nervures white, margined with fuscous, three conspicuous dark spots on each elytron; one each at middle of costa, middle

of clavus, and outer apical cell, the three together suggesting a cross band.

Female seventh sternite, fig. 349L, with posterior margin trilobate, central lobe shorter, broadly rounded, on either side of which is a rounded notch. Male plates, fig. 353, long, rather strongly and concavely narrowed and produced into long acute tips.

This is one of the abundant species living on cane, *Arundinaria tecta*, and apparently is restricted to that host plant, which occurs abundantly in the southeastern United States. It is found in the southern portion of Illinois, where the cane is distributed along the streams.

**Illinois Records.**—DOLSON: July 24, 1936, DeLong & Mohr, 1♂. ELIZABETH-TOWN: May 27, 1931, H. L. Dozier, 1♂. HEROD: Oct. 7, 1932, Ross & Burks, 1♂, 4♀; Aug. 4, 1934, DeLong & Mohr, 6♂, 11♀; May 29, 1935, Ross & Mohr, 1♂, 1♀; June 24, 1936, DeLong & Ross, 4♂, 15♀. KARNAK: Aug. 8, 1934, DeLong, Ross, & Mohr, 1♀. THEBES: July 11, 1935, DeLong & Ross, 1♂, 8♀. ULLIN: May 26, 1932, H. L. Dozier, 1♀. VIENNA: June 14, 1934, DeLong & Ross, 41♂, 32♀; July 10, 1935, DeLong & Ross, 2♂, 5♀.

#### 8. *Polyamia interrupta* (DeLong)

*Deltocephalus interruptus* DeLong (1916, p. 51).

Length 3.5–3.7 mm. Dull yellowish to brownish, with black and fuscous markings. Vertex, fig. 349E, slightly longer than basal width; two large spots at apex, sometimes joined with reflexed coloration of the face, a smaller spot on either side between these and eyes, and an irregular transverse band, broadest at middle between anterior margins of eyes, black or dark brown. Pronotum with longitudinal dark stripes. Elytra testaceous, nervures white, heavily and irregularly bordered with fuscous.

Female seventh sternite, fig. 349R, strongly and convexly produced at median two-thirds from near its base; rounded lateral lobes conspicuous at sides and produced to a line through posterior margin of seventh sternite. Male plates, fig. 350, strongly and concavely narrowed to long acute apices. Male aedeagus, fig. 367C, with basal portion slender, enlarged at about half its length to a broader portion, which is constricted to a long narrow dorsally curved apical fourth.

This species has been taken rather abundantly in open wooded areas where there is a luxuriant growth of herbaceous vegetation. It occurs in the eastern United States and is often confused with *weedi*.

**Illinois Records.**—Males and females, taken June 14 to September 30, are from Dixon Springs, Dolson, Dubois, Eichorn, Elizabethtown, Golconda, Herod, Karnak, Muncie, St. Anne, and Vienna.

#### 9. *Polyamia herbida* DeLong

*Polyamia herbida* DeLong (1935a, p. 155).

Length 2.8–3.0 mm. Resembling *weedi* in form and coloration. Vertex, fig. 349F, bluntly angled, slightly longer at middle than width between eyes; a pair of black spots next to ocelli and a pair of proximal oblique dashes just above apex of vertex; a dark band between anterior margins of eyes and a brownish blotch on posterior portion of vertex on either side of middle. Pronotum brown, with five pale longitudinal stripes. Scutellum pale, with a dark spot in each basal angle. Elytra brownish, veins mostly dark margined; some of veins conspicuously milky white, particularly the inner vein of each clavus, crossveins of outer clavus, basal crossveins between sectors, crossveins of corium, and veins surrounding outer anteapical cell.

Female seventh sternite, fig. 349S, roundly produced, lobes of underlying membrane conspicuous at each side. Male plates, fig. 360A, rapidly narrowed and produced in long attenuate apices. Male aedeagus, fig. 366C, very similar in form to that of *compacta*.

Described from Illinois, this species has been collected only on the sand prairie.

**Illinois Records.**—HANOVER: June 29, 1935, DeLong & Ross, 26♂, 21♀; sand prairie, July 10, 1934, DeLong & Ross, 4♂, 5♀; Aug. 22, 1935, DeLong & Ross, 1♀. SAVANNA: June 29, 1935, DeLong & Ross, 1♂. THOMSON: sand prairie, July 8, 1934, DeLong & Ross, 1♀.

#### 10. *Polyamia weedi* (Van Duzee)

*Deltocephalus weedi* Van Duzee (1892c, p. 306).

Length 3 mm. Dull yellowish, marked with black and fuscous. Vertex, fig. 349II, bluntly angled, as long as width between eyes, with four large black spots, the central

pair, just above apex, triangular, and an irregular brown band between anterior margins of the eyes; usually some indefinite markings at base of vertex. Pronotum faintly and longitudinally striped. Scutellum with a large brown spot in each basal angle and at apex. Elytra pale brown, nervures white, bordered with fuscous, cells usually dark in color.

Female seventh sternite, fig. 349P, with posterior margin rather evenly and strongly concave. Male plates, fig. 351, short and broad, triangular, apex bluntly angled. Aedeagus in lateral view appearing incised at apex more than half way to base, the dorsal portion curved dorsally and anteriorly at apex.

This is a very common grass-feeding species in the eastern half of the United States and is probably the most common species of the genus with the exception of *inimica*. It is commonly found in meadows, pastures, and other grassy areas.

**Illinois Records.**—Many males and females, taken June 10 to October 3, are from Aldridge, Alton, Anna, Apple River Canyon State Park, Brownfield, Browns, Bluff Springs, Cave in Rock, Dixon, Dixon Springs, Dolson, Dongola, East St. Louis, Eichorn, Elizabethtown, Fern Cliff, Fox Lake, Fulton, Galena, Gibsonia, Grand Detour, Grand Tower, Hanover, Havana, Herod, High Knob, Karnak, La Rue, Marshall, Monticello, Mount Carmel, Muncie, Newton, Oakwood, Oregon, Ripley, Rock Island, Shawneetown, Springfield, Starved Rock State Park, Thomson, Urbana, Vandalia, Vienna, White Heath, and White Pines Forest State Park.

## 11. *Polyamia compacta* (Osborn & Ball)

*Deltocephalus compactus* Osborn & Ball (1897, p. 217).

Length 2.75 mm. Yellowish, vertex, fig. 349G, marked somewhat similarly to that of *weedi*, bluntly angled, one-fourth wider between eyes than length at middle; black line from face visible from above, the four spots behind anterior margin and the transverse band between eyes fuscous. Elytra tawny to fuscous, some of the nervures broadly white, most cells heavily margined with fuscous.

Female seventh sternite, fig. 349Q, very short at lateral margins, then strongly and

roundedly produced on median two-thirds, forming a slightly trilobate posterior margin; underlying membrane deeply and circularly emarginate, visible only as acute lateral angles at the sides of the seventh sternite. Male plates, fig. 355, broad at bases, rapidly and concavely narrowing and produced to long attenuated tips, which exceed the pygofers. Aedeagus as in fig. 364C.

This is a very short robust species common in grassy areas and frequently abundant in hillside pastures or on prairies. It is distributed through the eastern United States and occurs as far west as the states of Iowa and Kansas.

**Illinois Records.**—METROPOLIS: Aug. 18, 1891, 2♂, 1♀; Aug. 19, 1891, Shiga & Hart, 1♂. PARKER: Aug. 14, 1909, 2♀. ZION: Aug. 7, 1935, Ross & DeLong, 16♂, 21♀.

## 12. *Polyamia saxosa* DeLong

*Polyamia saxosa* DeLong (1935a, p. 156).

Length 2.5–2.7 mm. Closely related to *compacta*. Vertex, fig. 349I, bluntly angled, about as wide between eyes as median length, pale straw yellow, with a pair of brownish quadrate spots, one next to either eye, and a pair of pale, orange, triangular spots at apex, an interrupted brownish band between anterior margins of eyes, and a dark area on posterior portion on either side of middle. Pronotum with dark spots on anterior portion. Scutellum pale, with a brown spot at apex. Elytra straw to pale brown; veins broadly white, with brown areas on apical, costal, and discal cells; each clavus white, with two brown elongated cells.

Female seventh sternite, fig. 349U, with side margins short, gradually sloping to broadly rounded posterior margin, which is slightly indented on either side of a median rounded lobe. Male plates, fig. 359, long, tapering to acute tips. Male aedeagus, fig. 365C, with apical constricted portion longer than in *compacta*, but otherwise very similar.

This species was taken from small grasses and herbaceous plants in a prairie habitat in Illinois and has not been recorded outside of this state.

**Illinois Record.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, DeLong & Ross, 6♂, 1♀.

13. *Polyamia alboneura* (DeLong)

*Deltocephalus alboneura* DeLong (1918b, p. 236).

Length 2.0–2.5 mm. Closely related to *apicata* but with black markings on vertex and with a more produced head. Vertex, fig. 349J, one-fourth longer at middle than basal width between eyes, pale yellow, with ocelli and four quadrate spots above margin black; a pair of transverse dashes between margins of eyes and a pair of oblique dashes on either side at base of vertex black or fuscous. Pronotum black, with five yellowish longitudinal stripes. Scutellum and elytra black, veins pale yellow. Face yellow, venter dark.

Female seventh sternite, fig. 349K, with posterior margin produced and appearing trilobate; visible portions of underlying membrane conspicuous as rounded lateral angles. Male plates concavely rounded to narrow tips, which are strongly produced.

Found in small numbers in grassy habitats, especially under humid conditions, this species is recorded from Mississippi, Tennessee, and the southern part of Illinois.

**Illinois Records.**—ELIZABETHTOWN: July 8, 1935, Ross & DeLong, 2♂. HEROD: July 6, 1935, DeLong & Ross, 3♂, 3♀. VIENNA: June 14, 1934, DeLong & Ross, 1♀.

14. *Polyamia dilata* DeLong

*Polyamia dilata* DeLong (1937a, p. 33).

Length 2.5–2.75 mm. Gray, resembling *compacta* in general appearance. Vertex bluntly angled, a little longer at middle than basal width between eyes; whitish in color, ocelli and an interior mesal spot black; a pair of proximal triangular spots just above apex pale brown, or orange; indications of a pale orange band at anterior margin of eyes and a pair of oblique marks each side at base; face dark, with pale arcs above. Pronotum brown, with pale longitudinal stripes. Scutellum pale brown. Elytra pale brown, veins broadly white, heavily margined with dark brown.

Female seventh sternite, fig. 349H, broadly and roundedly produced, with a slightly produced rounded lobe on central fourth; lateral lobes of underlying sternite conspicuous. Male plates, fig. 361A, long, concavely narrowed to acutely pointed

apexes. Aedeagus in lateral view, fig. 363C, with the body rather broad, scarcely narrowed anteriorly, posteriorly narrowed gradually to form a long apical third that is produced and curved caudally.

Occurring on prairie grasses in restricted habitats, this species has been taken in Illinois at only one locality, and is known only from Illinois.

**Illinois Record.**—APPLE RIVER CANYON STATE PARK: Aug 22, 1935, Ross & DeLong, 16♂, 18♀.

55. *DELTOCEPHALUS* Burmeister

*Deltocephalus* Burmeister (1838, pl. 14).

Vertex rather short, usually roundedly produced or bluntly angled, disc sloping or convexly rounding from pronotum to front, or with margin thick, scarcely angled with front. Ocelli close to the eyes and distinctly below the level of the disc. Venation of elytra simple, each central anteapical cell elongate, constricted, and usually divided.

The group of species in this genus can usually be recognized by the black coloration on the vertex in the form of spots, bars, and bands, which in some cases extend down along the eyes on the face, and by numerous heavy black arcs or bars on the face. The female seventh sternite is usually concave and frequently bears a sunken tooth.

About 35 species of *Deltocephalus* have been recorded for the United States; of these 7 are known to occur in Illinois. One or more others may eventually be found here.

## KEY TO SPECIES

1. Color uniform smoky brown, without definite markings; length 4.5 to 5.0 mm. . . . . 1. *fumidus*  
Not uniformly smoky brown, either black and usually with pale markings, or some shade of green or yellow; length not exceeding 3.5 mm. . . . . 2
2. Black in color or heavily marked with black or dark brown . . . . . 3  
Green or yellowish, marked with black spots or bands . . . . . 4
3. Dark brown to black, with several white spots on vertex, fig. 368C; anterior half of costal margins of elytra broadly yellow; length 3.0 mm. or more . . . . . 2. *flavicostus*  
Black, shiny, with few pale spots; costal margin not marked with yellow; length not more than 2.5 mm. . . . . 3. *gnarus*
4. Vertex with a broken band between anterior margins of eyes . . . . . 5  
Vertex without a broken band between

- anterior margins of eyes, a row of spots above margin.....8
5. With two small spots above apex of vertex.....6  
With a row of four spots above apex, fig. 368D.....7. **balli**
6. Band of vertex narrow, with an anterior projection at each end on inside margin of ocellus; body pale beneath.....7  
Band of vertex, fig. 368F, broad, irregular in outline, usually with a posteriorly projecting mark near each eye; body black beneath.....4. **nigriventris**
7. Elytra yellow, without dark markings.....5. **caperatus**

- Elytra pale, heavily infuscated.....6. **gramus**
8. Median spots of vertex, fig. 368A, usually merged, forming a larger transverse marking just above apex.....9. **decisus**  
Median spots not merged or proximal, distinctly separated at middle.....9
9. Vertex with four black spots above margin, the median pair smaller and approximate; two pairs of oblique dashes on base.....8. **sonorus**  
Vertex spots on margin, fig. 368D, larger, the outer spots usually elongate; oblique spots on base of vertex.....7. **balli**

1. *Deltocephalus fumidus* Sanders & DeLong

*Deltocephalus fumidus* Sanders & DeLong (1917 p. 86).

Length 4.5-5.0 mm. Smoky brown, iridescent in color. Vertex, fig. 368E, bluntly angled, a little wider between eyes than length at middle, smoky, darker at apex, ocelli black, encircled with white. Elytra pale brown, nervures paler, narrowly brown margined.

Female seventh sternite, fig. 374C, with posterior margin truncate, slightly sinuate, and infuscated either side of middle; underlying membrane with prominent lobes visible at side of seventh sternite. Male plates, fig. 374A, long, broad at base, and concavely narrowed to pointed apices.

This species has been collected only in southern Wisconsin but it should eventually be found in northern Illinois.

2. *Deltocephalus flavicostus* Stål

*Deltocephalus flavicostus* Stål (1859, p. 53).  
*Deltocephalus flavocostatus* Van Duzee (1892b, p. 116).  
*Deltocephalus retrorsus* Uhler (1895, p. 78).

Length 3.0-3.5 mm. Dark brown to black, with costal margins of elytra yellowish. Vertex, fig. 368C, roundedly conical, wider between eyes than median length, with a pale spot enclosing each ocellus, a pale spot at tip of apex, three pale spots arranged concentrically behind apex, and pale spots at the base. Pronotum with faint traces of pale longitudinal lines. Elytra with veins usually paler, the anterior half of each costa usually broadly yellow, and the costal veinlets on posterior portion broadly white. Face black.

Female seventh sternite, fig. 369C, with posterior margin sinuate, forming four rather distinct lobes, the inner pair nar-

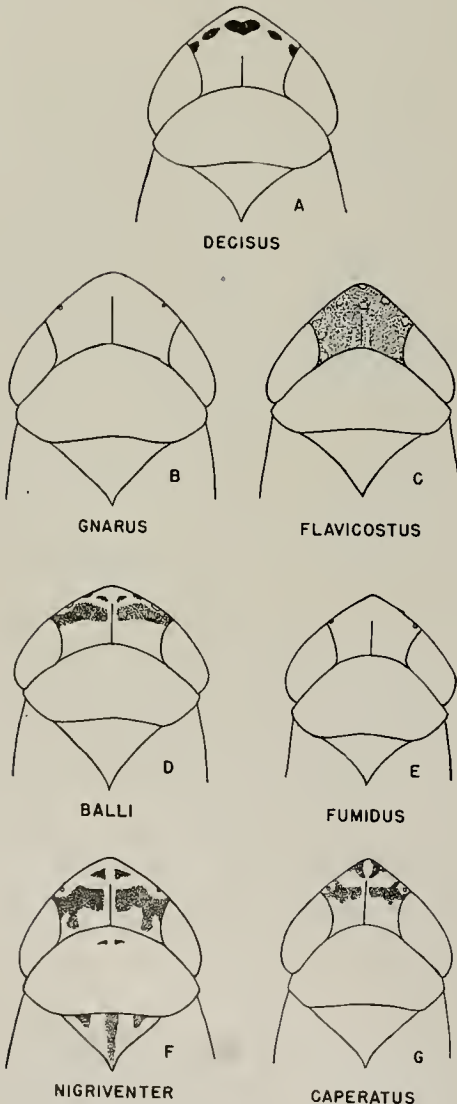
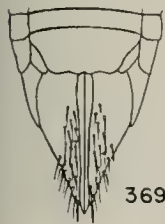


Fig. 368.—*Deltocephalus*. A-G, heads and pronota.



rower; lobes of underlying membrane visible at the sides. Male plates, fig. 369, gradually narrowed to blunt rounded tips.

Aedeagus with a dorsal spur at base, body curved dorsally, constricted on apical third, apex bluntly pointed.



369 C



369 A



369 B

FLAVICOSTUS

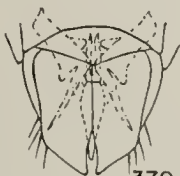


374 C

FUMIDUS

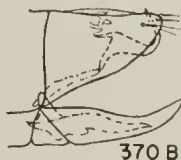


370 C



370 A

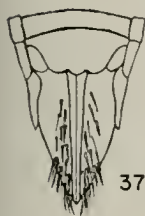
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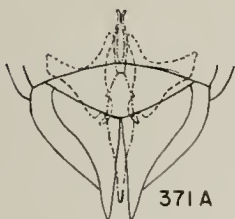
370 B



374 A

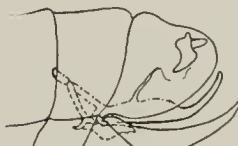


371 C

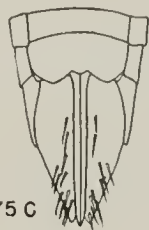


371 A

CAPERATUS



371 B



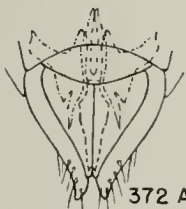
375 C

GNARUS



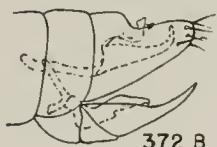
372 C

BALLI

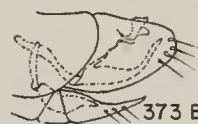


372 A

BALLI

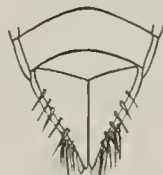


372 B



373 B

SONORUS

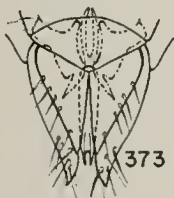


375 A

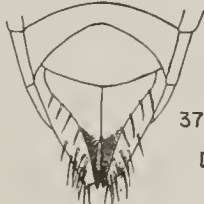


373 C

SONORUS

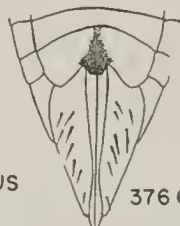


373 A



376 A

DECISUS



376 C

Figs. 369-376.—*Deltocephalus*. A, ventral aspect of male genitalia; B, lateral aspect of male genitalia; C, female genitalia.

This is a common grass-feeding species in the East and Middle West and occurs abundantly in almost every grassy area, especially in meadows and pastures.

**Illinois Records.**—Many males and females, taken from May 25 to November 4, are from Aldridge, Alto Pass, Amboy, Anna, Anvil Rock, Brownfield, Cave in Rock, Champaign, Clay City, Cobden, Decatur, Dixon Springs, Dolson, Dongola, Eichorn, Elizabethtown, Fern Cliff, Fountain Bluff, Fulton, Grand Detour, Grand Tower, Hardin, Harrisburg, Jonesboro, Karnak, Macomb, Marshall, Metropolis, Mount Carmel, Muncie, Normal, Oak Lawn, Oakwood, Pekin, Port Byron, Quincy, Shawneetown, Sparta, Springfield, Temple Hill, Urbana, Vandalia, Vienna, Villa Ridge, Virginia, and Watson.

### 3. *Deltocephalus gnarus* Ball

*Deltocephalus gnarus* Ball (1900c, p. 345).

Length 2.25–2.5 mm. Minute, shiny black. Vertex, fig. 368B, blunt, one-fourth wider between eyes than median length, a pale spot at apex often connected to a cross back of it, and sometimes connecting by lines to the circles around ocelli; a pair of pale oblique dashes from margin toward disc. Pronotum with a row of light submarginal spots, and with the posterior margin narrowly light. Scutellum black. Elytra white, subhyaline, veins milky; in the male the disc of each elytron is often smoky. Face black, with numerous dashes and pale arcs.

Female seventh sternite, fig. 375C, with posterior margin almost truncate; central fourth slightly indented, bearing a very minute blunt tooth at center; membranous plates exposed at sides of seventh sternite. Male plates, fig. 375A, slightly and roundedly narrowed to pointed tips.

This is a minute species known previously from Iowa, South Dakota, and Tennessee. It closely resembles *Macrosteles potoria*, and the two species occur together on *Eleocharis* and similar aquatic plants. It has been taken in Illinois only in the central and northern parts of the state.

**Illinois Records.**—BEACH: July 25, 1934, Frison & DeLong, 2 ♀. CHAMPAIGN: Sept. 20, 1886, C. A. Hart, 1 ♀. OAK LAWN: July 1, 1935, DeLong & Ross, 26 ♂, 21 ♀. URBANA: May 27, 1889, C. A. Hart, 1 ♂.

### 4. *Deltocephalus nigriventer* Sanders & DeLong

*Deltocephalus nigriventer* Sanders & DeLong (1917, p. 85).

Length 2.5–2.75 mm. Yellow, robust, with dark markings. Vertex, fig. 368F, about two-thirds as long as basal width between eyes; yellow, with a pair of apical black spots just back of apex, and a broad sinuate black band, interrupted at middle, between anterior margins of eyes and ocelli. Pronotum pale; scutellum, spots in basal angles, and a median longitudinal stripe black. Elytra milky gray, subhyaline, each clavus irregularly mottled with brown; a large black spot on each discal cell, one on third anteapical cell, and another midway on costal margin. Nervures milky white. Face and venter black.

Female seventh sternite, fig. 370C, with posterior margin almost truncate and incised at middle almost to the base, the margins of incision almost overlapping. Male plates, fig. 370, broadly convex, tapering to rounded upturned blunt apices. Aedeagus short, rapidly tapered on basal half to a slender tapered upturned apical half, which is sharp pointed.

A northern species occurring in old pastures on grasses, *nigriventer* will probably be found in northern Illinois.

### 5. *Deltocephalus caperatus* Ball

*Deltocephalus caperatus* Ball (1900c, p. 343).  
*Deltocephalus vinnulus* Crumb (1915, p. 192).

Length 3 mm. Pale yellow, with black markings. Vertex, fig. 368G, bluntly angled, about as long at middle as width between eyes, with black markings from the front extending on to vertex and forming a triangular spot on either side of apex, and a broken transverse black band between anterior margins of eyes. Elytra olive, subhyaline, veins whitish, sometimes narrowly fuscous margined. Face black above, with pale arcs, a black band along apex on the front.

Female seventh sternite, fig. 371C, with lateral margins short, lateral angles rounded to posterior margin, which is bisinuate, forming three lobes, the central one smallest; membranous lateral angles visible. Male plates, fig. 371, concavely narrowed and produced to gradually tapering acutely angled apices.

This species is commonly found in the *Andropogon virginicus* association, and apparently feeds on that plant. It is distributed through the eastern half of the United States and ranges west to Colorado.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: Aug. 22, 1933, DeLong & Ross, 1 ♀; July 11, 1934, DeLong & Ross, 4 ♂, 3 ♀. DIXON SPRINGS: July 9, 1935, DeLong & Ross, 1 ♀. EVERGREEN PARK: Aug. 23, 1934, DeLong & Ross, 1 ♂, 2 ♀. FERN CLIFF: Aug. 3, 1934, DeLong & Mohr, 2 ♀.

#### 6. *Deltocephalus gramus* (DeLong)

*Polyamia grama* DeLong (1935a, p. 156).

Length 2.3 mm. Yellowish, with black markings. Vertex bluntly angled, longer than basal width between eyes; a pair of large spots just back of apex; a broad transverse black band, broken at middle, extending between anterior margins of eyes; a portion of band arises at outer end and extends anteriorly, surrounding the ocelli; posterior half of vertex dark. Pronotum dark, marked with heavy black spots on anterior half. Elytra pale brown, veins lighter, margined with heavy brown infuscations; elytra appearing longitudinally striped. Face with a prominent curved marginal band just below vertex, extending down either side of face, and arcs of face dark brown.

Male plates rather broad at bases, rapidly narrowed to finger-like apices, which are greatly produced and acutely pointed.

Only two male specimens of this species are known, and these were taken in northern Illinois on grasses in prairie habitats.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: Aug. 27, 1934, Frison & DeLong, 1 ♂. CHICAGO: Sept. 16, 1930, D. M. DeLong, 1 ♂.

#### 7. *Deltocephalus balli* Van Duzee

*Deltocephalus nigrifrons* Van Duzee (1894c, p. 293). Name preoccupied.

*Deltocephalus balli* Van Duzee (1916, p. 71). New name.

Length 3.0–3.5 mm. Yellow to greenish, marked with black spots. Vertex, fig. 368D, bluntly angled, almost one-third wider between eyes than median length, usually with four eyes above the front margin; the inner pair of spots may vary in size and

the outer pair are often short bands extending from margins of the eyes and interrupted at the middle. Pronotum usually pale anteriorly and darker posteriorly. Elytra smoky or olive subhyaline, nervures paler. Face black, with pale arcs.

Female seventh sternite, fig. 372C, with posterior margin sinuately sloping to a slightly excavated central portion that bears a minute black tooth at its apex; membranous lobes conspicuous at sides of segments. Male plates, fig. 372, broad at bases, convexly rounded to blunt tips, which equal or surpass pygofers. The aedeagus is short, gradually narrowed to a blunt upturned tip.

This species is abundant in meadows and pastures, and is commonly found throughout the northeastern United States.

**Illinois Records.**—Many males and females, taken from March to October 16, are from Albion, Algonquin, Alsip, Antioch, Beach, Dixon, Duncans Mills, Fox Lake, Fulton, Galena, Grafton, Gullport, Havana, Homer, Karnak, Luther, McHenry, Mount Carmel, Muncie, Oak Lawn, Oquawka, Pere Marquette State Park, Port Byron, Putnam, Savanna, Sheffield, Summit, Urbana, Vienna, Volo, Watson, Wauconda, Waukegan, and Zion.

#### 8. *Deltocephalus sonorus* Ball

*Deltocephalus sonorus* Ball (1900c, p. 344).

Length 3.25 mm. Slender, green to yellowish, marked with black spots. Vertex rounded at apex, one-fourth wider between eyes than median length, with four black spots on the anterior margin; inner pair usually quadrate and smaller than outer; usually a pair of elongate fuscous spots on either side of middle at base, and a pair on disc. Pronotum with five yellowish longitudinal stripes. Elytra olive to yellowish, subhyaline, veins pale, often margined with fuscous.

Female seventh sternite, fig. 373C, with posterior margin slightly excavated and with a short produced rounded median lobe. Male plates, fig. 373, broad at bases, gradually narrowed to acute tips. Aedeagus rather short, curved dorsally on apical third, narrowed, and with a bluntly pointed apex.

This species occurs upon grasses and many cultivated crops, for example, wheat, clover, and alfalfa, and it can be found in abundance in pastures, meadows, and other open

habitats where grasses are common. It is widely distributed from Florida through the Middle West to Arizona and California.

**Illinois Records.**—ALTON: June 26, 1934, DeLong & Ross, 2 ♀. AMBOY: Aug. 8, 1934, DeLong & Ross, 1 ♀. EVERGREEN PARK: Aug. 23, 1934, DeLong & Ross, 1 ♂. GIBSONIA: Oct. 2, 1934, Frison & Ross, 1 ♀. HAVANA: Aug. 8, 1934, Frison & Mohr, 3 ♂, 8 ♀. OQUAWKA: July 30, 1936, Mohr & Burks, 1 ♀. VIENNA: on cane, June 14, 1934, DeLong & Ross, 1 ♀.

### 9. *Deltocephalus decisus* DeLong

*Deltocephalus decisus* DeLong (1926a, p. 55).

Length 2.5 mm. Straw yellowish, with black spots. Vertex, fig. 368A, as long at middle as basal width, the sides convexly rounded, with a large black transverse spot just behind apex, this spot sometimes divided into two separate spots; also an elongated black spot on either side along margin midway to eye and a smaller one next to each eye; margin of vertex milky white between this row of spots and a heavy black band on front just below margin. Elytra brownish yellow, subhyaline, nervures paler. A black spot on last dorsal tergite of both sexes.

Female seventh sternite, fig. 376C, with posterior margin broadly and angularly excavated one-third the distance to base and bearing a broad blunt tooth at apex. Male plates, fig. 376A, broad at bases, concavely narrowed and produced into long blunt processes, these black on either apical half.

This is another grass-feeding species that is not found abundantly but seems to occur in moist habitats on short grasses. It was previously recorded from Florida only, and has been taken in southern Illinois.

**Illinois Records.**—SHAWNEETOWN: June 23, 1936, DeLong & Ross, 1 ♂. VIENNA: June 14, 1934, DeLong & Ross, 1 ♂, 1 ♀.

### 56. *LONATURA* Osborn & Ball

*Lonatura* Osborn & Ball (1898, p. 83).

Fig. 203. Head conically and obtusely angled, pronotum with posterior margin truncate. Macropterous form with long narrow elytra, appendix large, venation obscure. Brachypterous form with short elytra, covering second abdominal segment; wings rudimentary, venation obscure.

The species of this genus are grass-feed-

ing forms and as far as known live in prairie habitats or upland pastures and meadows. Eleven species and one variety are known to occur in the United States, and one of these has been taken in Illinois.

### 1. *Lonatura catalina* Osborn & Ball

*Lonatura catalina* Osborn & Ball (1898, p. 83).

Length of macropterous form 2.75 mm.; brachypterous 1.8–2.25 mm. Vertex about as long as basal width. Macropterous form greenish gray, vertex tinted with yellow; eyes black. Brachypterous form, fig. 238C, uniform creamy white or orange in color, vertex and face often yellow; pronotum and elytra brown, and abdomen almost black.

Female seventh sternite emarginate posteriorly, with a bilobed process. Male plates small, triangular, apexes produced.

In the Middle West this is a very abundant species in the *Aristida gracilis* association, and is frequently found on hillside pastures or in areas that have been denuded and where *Aristida* is the pioneer vegetation. It also occurs in sand prairies and certain of the more moist prairies.

**Illinois Records.**—CAVE IN ROCK: Oct. 2, 1934, Frison & Ross, 1 ♂, 2 ♀. HARDIN: June 27, 1934, DeLong & Ross, 43 ♂, 39 ♀. HEROD: July 8, 1935, DeLong & Ross, 1 ♀.

### 57. *HEBECEPHALUS* DeLong

*Hebecephalus* DeLong (1926a, p. 58).

Fig. 227. Vertex bluntly angled, disc usually flattened, margin thickened and bluntly angled with front. Elytra usually rather long, central anteapical cell of each elongated, strongly constricted at middle, enlarged at either end, and decidedly produced beyond the other anteapical cell.

More than 30 species of *Hebecephalus* have been recorded for the United States, nearly all of which occur in the West. Only two of these species are found in the East, and they have been collected in Illinois.

#### KEY TO SPECIES

1. Vertex wider than long; female seventh sternite, fig. 377D, with a deep narrow abrupt excavation at center; male plates, fig. 377C, broad, shorter than combined width at base, apexes truncate. . . . .  
 . . . . . **1. signatifrons**  
 Vertex as long as wide; female seventh sternite, fig. 377D, sinuate or truncate, not excavated; male plates, fig. 377C,

as long as combined basal width, more narrowed, wedge shaped. 2. *cruciatu*s

tween eyes than length at middle; ocelli, a pair of marginal dashes close to apex, a pair of large rectangular spots behind these, each with a spur extending to margin, and a pair of large round spots on base fuscous. Pronotum with traces of five pale longitudinal stripes. Elytra gray, nervures pale, margined with fuscous, often appearing banded by heavy fuscous markings.

Female seventh sternite, fig. 377D, with posterior margin shallowly and concavely rounded between prominent lateral angles and a pair of large rounded median lobes; lobes separated by a square notch extending almost half way to the base; at the bottom of notch a broad tooth is slightly produced. Male plates, fig. 377C, broad at bases, gradually narrowed to very broad rounded apices. Aedeagus, fig. 377B, with a pair of apical spines directed laterally.

This species, which is western and middle western in distribution, occurs commonly on grasses and herbaceous vegetation. It has been reported as living in the *Setaria-Panicum* association.

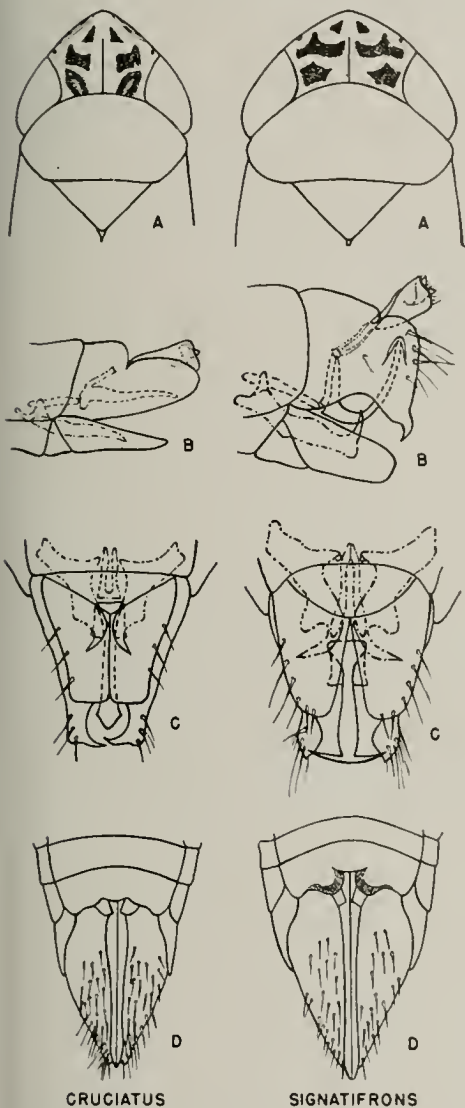
**Illinois Records.**—Males and females, taken May 30 to September 20, are from Apple River Canyon State Park, Beach, Decatur, Dixon, Fulton, Grand Tower, Herod, Homer, Karnak, Muncie, Seymour, Springfield, Starved Rock State Park, Summit, Urbana, Wauconda, and Zion.

## 2. *Hebecephalus cruciatus* (Osborn & Ball)

*Deltocephalus cruciatus* Osborn & Ball (1898, p. 77).

Length 2.75–3.0 mm. Pale gray, resembling *signatifrons* but smaller. Vertex, fig. 377A, bluntly angled, length equaling basal width between eyes. Frontal arcs extending over margin, a pair of fuscous triangular spots just back of apex, two irregular fuscous oblique spots between ocelli, and a pair of fuscous spots on each side at base. Pronotum with five pale longitudinal stripes. Scutellum with four small spots along anterior margin. Elytra whitish, nervures pale, margined with fuscous, a few cells often quite dark.

Female seventh sternite, fig. 377D, with posterior margin slightly concave and sinuate. Male plates, fig. 377C, broad at base, gradually narrowed to truncate tips, which are one-half as wide as at base. Aedeagus in lateral view, fig. 377B, tapered to a nar-



CRUCIATUS

SIGNATIFRONS

Fig. 377.—*Hebecephalus*. A, head and pronotum; B, male genitalia, lateral aspect; C, male genitalia, ventral aspect; D, female genitalia.

## 1. *Hebecephalus signatifrons* (Van Duzee)

*Deltocephalus signatifrons* Van Duzee (1892c, p. 305).

Length 3.0–3.5 mm. Pale yellow to gray, with fuscous markings. Vertex, fig. 377A, bluntly angled, about one-third wider be-

row apex; in ventral view widened just before apex and bluntly pointed.

This species, reported previously from North Dakota and Iowa, occurs on prairie plants in the prairie habitat.

**Illinois Records.**—**DECATUR:** June 29, 1935, Frison & Mohr, 1 ♀. **FULTON:** Aug. 22, 1935, DeLong & Ross, 2 ♂, 8 ♀. **HANOVER:** sand prairie, July 10, 1934, DeLong & Ross, 1 ♂, 1 ♀; June 29, 1935, DeLong & Ross, 10 ♀; Aug. 22, 1935, DeLong & Ross, 7 ♂, 8 ♀. **ST. ANNE:** July 20, 1934, DeLong & Ross, 2 ♂, 1 ♀. **THOMSON:** July 8, 1934, DeLong & Ross, 5 ♂, 2 ♀; June 30, 1935, DeLong & Ross, 21 ♀; Aug. 16, 1937, 1 ♀. **ZION:** July 16, 1935, DeLong & Ross, 1 ♀.

58. *LAEVICEPHALUS* DeLong

*Laevicephalus* DeLong (1926a, p. 64).

Vertex varying from a sharply angled and pointed type, the vertex acutely angled with front, to a rather bluntly angled type with sides often rounding to apex, and with vertex bluntly angled with front. Vertex flattened on disc. Venation simple.

With few exceptions the species belonging to this genus are some shade of green or yellow, quite uniform in color, and without dark markings.

About 60 species of *Laevicephalus* have been described for the United States, 9 of which are known to occur in Illinois. As far as is known, practically all of them are grass feeders and are usually found in pastures and meadows.

KEY TO SPECIES

- 1. Vertex longer than basal width between eyes, usually distinctly angled and pointed, occasionally with tip more blunt.....2
- Vertex broader between eyes than length at middle, or, if as long, then with apex roundedly pointed, not sharply angled.....7
- 2. Length not more than 3.0 mm.....3
- Length more than 3.5 mm.....5
- 3. Dull yellowish, with two broad longitudinal brown stripes extending across pronotum to scutellum.....1. *shingwauki*
- Greenish or greenish yellow, with definite dark markings.....4
- 4. Female seventh sternite, fig. 386E, narrowly incised at middle, a round black spot on either side. Male plates, fig. 382A, convexly rounded, almost as long as pygofer, apices angled.....2. *minimus*

- Female seventh sternite, fig. 386H, with a broad shallow excavation; male plates, fig. 381, shorter, apices broadly rounded, almost truncate.....3. *melsheimerii*
- 5. Female seventh sternite, fig. 386G, sinuate, with three small lobes at center; male plates, fig. 379, tapered and abruptly narrowed to narrow attenuated apices.....4. *unicoloratus*
- Female seventh sternite distinctly produced at center, as in fig. 386I; apices of male plates not attenuated, but narrowed and pointed.....6
- 6. Female seventh sternite, fig. 386I, with median third abruptly produced and truncated. Male plates, fig. 383, with tips quite broad, bluntly pointed and divergent.....5. *ylvestris*
- Female seventh sternite, fig. 386A, with median half gradually produced to a pointed brownish tooth. Male plates, fig. 378, tapered to narrowly rounded tips.....6. *acus*
- 7. Greenish, with two parallel brownish stripes on vertex, on pronotum, and on scutellum.....7. *concinus*
- Greenish, without parallel brownish stripes.....8
- 8. Female seventh sternite, fig. 386F, produced and incised at middle; male plates, fig. 385, strongly and convexly rounded to broad blunt apices.....8. *orientalis*
- Female seventh sternite, fig. 386B, produced but not incised; male plates, fig. 380, narrowed to pointed apices.....9. *pravus*

1. *Laevicephalus shingwauki* Beamer & Tuthill

*Laevicephalus shingwauki* Beamer & Tuthill (1934, p. 19).

Length 2.5–3.0 mm. Dull yellow, with black markings. Vertex slightly longer than width between eyes, with two dark almost parallel broad stripes extending across pronotum to scutellum. Elytra somewhat smoky. Male and female with two large black spots on last abdominal segment, spots of female smaller. Female seventh sternite, fig. 386D, with posterior margin produced at middle into a broad tooth. Male plates, fig. 384A, broad at bases, slightly converging to broad truncate apices. Male aedeagus, fig. 384B, short, broad, cylindrical, a narrow process arising on dorsocaudal margin, bifurcate near its base, the two processes long, curved laterally and ventrally.

This is an abundant species in the fresh-water marshes of Illinois, occurring on tall grasses that grow in clumps. It is known only from this state and Minnesota.

**Illinois Records.**—Males and females,

taken June 30 to September 18, are from Amboy, Beach, Des Plaines, Fox Lake, Oak Lawn, St. Anne, Summit, Volo, Waukegan, and Zion.

2. *Laevicéphalus minimus* (Osborn & Ball)

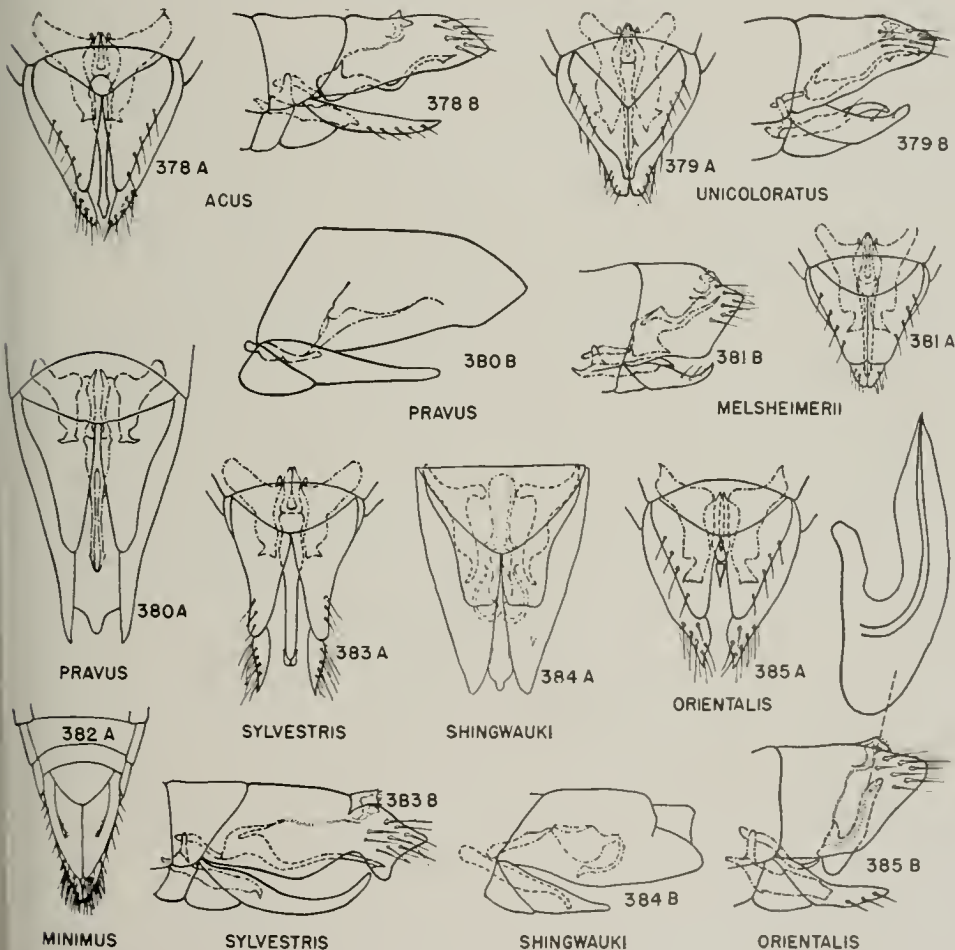
*Deltocéphalus minimus* Osborn & Ball (1897, p. 211).

Length 2.5-3.0 mm. Small, greenish yellow, with a bluntly angled vertex. Paler on vertex, with traces of two brownish arcs on each side extending from apex toward ocellus. Elytra milky hyaline, nervures yellowish, faintly bordered with fuscous, especially in male. Face dull brownish. Female seventh sternite, fig. 386E, with posterior

margin roundedly produced, narrowly incised at middle, with a very small rounded notch on either side, median third black margined. Male plates, fig. 382A, tapering to bluntly pointed tips, almost as long as the pygofers and each bearing a black spot at middle.

This is a middle western species, and has been found on grasses of the genus *Stipa* in the *Sporobolus-Stipa* habitats of northern Illinois.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, Frison & DeLong, 7♂, 3♀; Aug. 22, 1935, DeLong & Ross, 2♂, 1♀. WARREN: Aug. 28, 1934, Frison & DeLong, 1♂, 5♀. WHITE PINES FOREST STATE PARK: Aug. 27, 1934, Frison & DeLong, 69♂, 69♀.



Figs. 378-385.—*Laevicéphalus*, male genitalia. A, ventral aspect; B, lateral aspect.

### 3. *Laevicephalus melsheimerii* (Fitch)

*Amblycephalus melsheimerii* Fitch (1851, p. 61).

Length 2.5–2.75 mm. Vertex longer than width between eyes, sharply angled. Female uniform yellowish, with milky white ner-

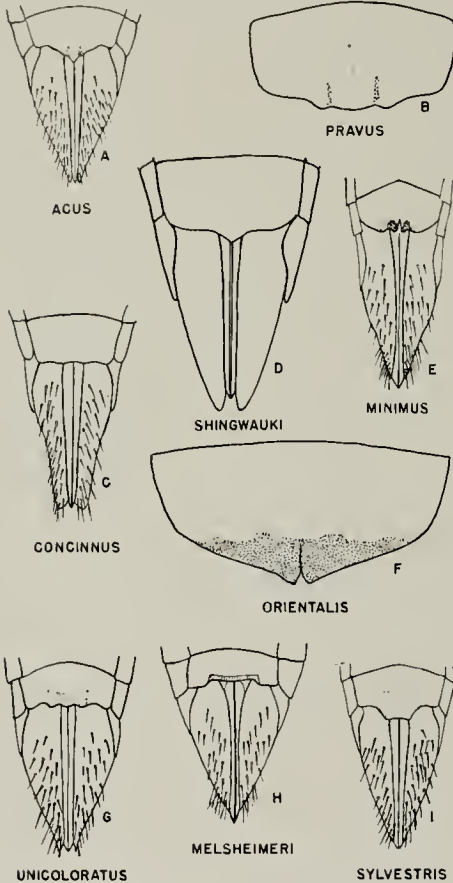


Fig. 386.—*Laevicephalus*. A–I, female genitalia.

vures. Male head, pronotum, and scutellum brighter yellow, a faint brown arc on either side of vertex extending from apex to black ocelli. Elytral nervures faintly bordered throughout with fuscous. Face pale brown.

Female seventh sternite, fig. 386H, with median half of posterior margin having a simple very shallow black-bordered excavation. Male plates, fig. 381A, broad at bases, only slightly narrowed to broadly rounded upturned tips appearing from below as almost truncate; a median brownish line expanding toward tip of each plate. Aede-

agus in lateral view, fig. 381B, broad at base, with a short dorsobasal process; notch at about the middle of caudal side producing a long narrowed attenuated process dorsal to notch.

Distributed through the eastern states and west to Colorado, this species occurs on dry uplands, pastures, and meadows in the *Danthonia* association, where it has been collected from *Danthonia spicata* and *compressa*.

**Illinois Records.**—Males and females, taken March 28 to October 3, are from Anvil Rock, Dixon Springs, Dolson, Elizabethtown, Gibsonia, Grand Detour, High Knob, Monticello, Muncie, Norris City, Ozark, Palos Park, and Starved Rock State Park.

### 4. *Laevicephalus unicoloratus* (Gillette & Baker)

*Deltocephalus unicoloratus* Gillette & Baker (1895, p. 89).

*Deltocephalus oculatus* Osborn & Ball (1897, p. 212). Preoccupied.

*Deltocephalus nominatus* Sanders & DeLong (1920, p. 9). New name for *oculatus* O. & B.

Length 3.5 mm. Pale yellowish to greenish. Vertex a little longer than basal width between eyes. Ocelli, impressed line on vertex, and eyes dark; interocellar line from apex to ocelli pale brownish. Elytra subhyaline, nervures yellowish. Female seventh sternite, fig. 386G, with median third of posterior margin produced, dark margined, and scarcely trilobate. Male plates, fig. 379A, convex, narrowed to produced attenuated tips. Aedeagus, fig. 379B, long, narrowed, and slender on median third, broadened on apical third and bearing a ventral tooth about one-fourth the distance from apex.

This species is common on *Andropogon* in the east-central states and in Illinois in certain of the dark prairie and sand prairie habitats.

**Illinois Records.**—CAVE IN ROCK: Oct. 2, 1934, Frison & Ross, 1 ♀. DONGOLA: May 11, 1917, 1 ♀. EVERGREEN PARK: Aug. 23, 1934, DeLong & Ross, 31 ♂, 28 ♀; July 1, 1935, DeLong & Ross, 5 ♂, 6 ♀. HANOVER: June 29, 1935, DeLong & Ross, 1 ♀. OAK LAWN: in lamp globe, Aug. 23, 1934, 1 ♂, 1 ♀. ST. ANNE: July 20, 1934, DeLong & Ross, 3 ♂, 16 ♀; Aug. 21, 1934, DeLong & Ross, 3 ♀; Aug. 26, 1935, DeLong & Ross, 1 ♀. VIENNA: June 14, 1934, DeLong &



Ross, 1 ♀. ZION: July 16, 1935, DeLong & Ross, 1 ♂, 3 ♀; Aug. 7, 1935, DeLong & Ross, 1 ♀.

5. *Laevicephalus sylvestris* (Osborn & Ball)

*Deltocephalus sylvestris* Osborn & Ball (1897, p. 213).

Length 3.5 mm. Dull greenish, tinged with yellow. Vertex distinctly angled, about one-fourth longer than width between eyes. Ocelli and eyes dark; a rather heavy fuscous stripe on either side of apex extending obliquely onto disc, then broadening and continuing to pronotum. Elytra whitish or dull hyaline, nervures greenish yellow, often broadly margined with fuscous, especially on apical portions and along sutural line.

Female seventh sternite, fig. 386I, emarginate posteriorly on either side of an abruptly produced black truncated process that is almost one-third the length of the segment on the median third. Male plates, fig. 383A, with sides concavely narrowed to bluntly pointed divergent tips. Aedeagus long, in lateral view, fig. 383B, with basal third broadened and bearing a dorsal spine; apical two-thirds narrow and slightly enlarged at apex.

This distinctive species occurs with *mel-sheimerii* in the *Danthonia spicata* association and probably feeds on several of the grasses. It is a common and widely distributed species from the Great Lakes region to the Gulf Coast.

**Illinois Records.**—Many males and females, taken May 18 to November 4, are from Alton, Apple River Canyon State Park, Atlas, Barry, Cave in Rock, Dixon Springs, Dolson, Dubois, Eichorn, Fairfield, Fox Lake, Galena, Geff, Havana, Herod, Hope-dale, Jonesboro, Karnak, Mahomet, Marshall, Monticello, Mount Carmel, Muncie, New Milford, Newton, Olive Branch, Oregon, Ozark, Pike, Port Byron, St. Anne, Savanna, Seymour, Shawneetown, Temple Hill, Urbana, Vienna, Watson, White Pines Forest State Park, and Wilmington.

6. *Laevicephalus acus* (Sanders & DeLong)

*Deltocephalus acus* Sanders & DeLong (1920, p. 10).

Length 4 mm. Yellowish green, sharp headed. Vertex one-fifth longer at middle

than width between eyes; the median impressed line, ocelli, and arcuate line from apex toward eye pale brown. Elytra milky hyaline, veins paler, faintly bordered with fuscous. Face sordid yellow, with paler arcs.

Female seventh sternite, fig. 386A, with median half of posterior margin produced, forming a broad, pointed tooth with sinuate sides and margined with brown. Male plates, fig. 378A, concavely narrowed to bluntly pointed apices. Aedeagus in lateral view, fig. 378B, broad at base, with a very blunt dorsal spur; narrowed at one-third its length to a narrow apical portion that is slightly enlarged at apex.

This is a grass-feeding species that seems to be found more abundantly upon coarse grasses in swampy areas than elsewhere. It has not been taken on the prairies. It is northern in distribution, ranging from New York west to Wisconsin and Illinois.

**Illinois Record.**—WAUCONDA: June 23, 1934, DeLong & Ross, 1 ♀.

7. *Laevicephalus concinnus* (Sanders & DeLong)

*Deltocephalus concinnus* Sanders & DeLong (1917, p. 86).

Length 3 mm. Greenish, marked with longitudinal stripes. Vertex bluntly angled, as long as wide. Ocelli black; vertex, pronotum, and scutellum each with two broad parallel brownish stripes, and an additional stripe behind each eye on pronotum. Elytra with white nervures. Face dusky. Female seventh sternite, fig. 386C, slightly longer than preceding sternite, almost truncate, sinuate, and with median brown spot. The male is not known.

This species has been collected in tall grasses and sedges in marshes in Wisconsin and northern Illinois.

**Illinois Records.**—FOX LAKE: June 30, 1935, DeLong & Ross, 1 ♀; June 26, 1936, 4 ♀.

8. *Laevicephalus orientalis* DeLong & Davidson

*Laevicephalus orientalis* DeLong & Davidson (1935, p. 167).

Length 3.5–4.0 mm. Vertex as long as basal width between the eyes, creamy to bright yellow. Pronotum and scutellum greenish, washed with yellow. Elytra vary-

ing in color, sometimes dark green, with white or yellowish veins, often with apexes smoky.

Female seventh sternite, fig. 386*F*, without lateral angles, posterior margin produced, sloping to middle of segment, which is distinctly incised, leaving a pair of inconspicuous teeth at middle. Male plates, fig. 385*A*, broad at bases, strongly and convexly curved to rather blunt and broad apexes. Aedeagus in lateral view, fig. 385*B*, appearing broad, with a curved portion extending ventrally and posteriorly and produced by being curved upward; this structure open in the middle and appearing as two parallel pieces.

Distributed from Pennsylvania to Tennessee and Illinois, this species has been taken commonly in open woodland on *Elymus* grasses.

**Illinois Records.**—CAVE IN ROCK: May 7, 1932, H. L. Dozier, 1 ♀. DUBOIS: May 21, 1917, 1 ♂. EICHORN: Hicks Branch, June 13, 1934, DeLong & Ross, 6 ♀. ELIZABETHTOWN: May 27–31, 1932, Dozier, 1 ♀. HARDIN: June 5–9, 1932, Dozier, 1 ♀. MONTICELLO: June 11, 1934, Frison & DeLong, 1 ♂. SHAWNEETOWN: June 14, 1934, Ross & DeLong, 2 ♀.

### 9. *Laevicephalus pravus* DeLong

*Laevicephalus pravus* DeLong (1937*b*, p. 34).

Length 3.0–3.5 mm. Yellowish, resembling *unicoloratus* in general appearance. Vertex bluntly angled, a little wider between eyes than median length, bright yellow, unmarked. Ocelli and ovipositor black.

Female seventh sternite, fig. 386*B*, roundly produced, almost truncate. Male plates long, tapered to acute apexes. Aedeagus in lateral view, fig. 380*B*, narrowed at half its length and tapered to a long threadlike attenuated apex; in ventral view it appears broad at base, rapidly narrowed and produced, slightly enlarged just before apex, and with teeth on the outer margin; tip of aedeagus bluntly pointed.

This species was taken abundantly in a prairie habitat in northern Illinois, and from one other locality in the state. It is known only from Illinois.

**Illinois Records.**—DES PLAINES: Sept. 4, 1935, DeLong & Ross, 1 ♂; Sept. 18, 1935, DeLong & Ross, 15 ♂, 52 ♀. HANOVER: Aug. 22, 1936, 1 ♂.

### 59. *PSAMMOTETTIX* Haupt

*Psammotettix* Haupt (1929, p. 262).

Fig. 236*B*. Closely related to *Laevicephalus*, this genus is distinguished chiefly by having the male plates, figs. 387, 388, shorter than the valve, and the female seventh sternite, fig. 236, is usually broadly and concavely rounded and relatively simple on the posterior margin.

Twelve species have been recorded in this genus for the United States under the *striatus* group of *Laevicephalus* (DeLong & Knull, 1945). Two species occur in Illinois.

#### KEY TO SPECIES

Male aedeagus, fig. 387, blunt and entire at apex; connective long, slender. . . . **1. striatus**  
Male aedeagus, fig. 388, sharp pointed at apex and bifurcate one-third the length of aedeagus; connective short, horseshoe shaped. . . . **2. ferratus**

#### 1. *Psammotettix striatus* (Linnaeus)

*Cicada striata* Linnaeus (1758, p. 437).

Length 3.5–4.0 mm. Greenish, markings variable in color. Vertex blunt and broadly angled, often with definite fuscous spots or blotches, interocellar line pale. Elytra variable, nervures frequently fuscous margined, and often so dark that elytra appear striped.

Female seventh sternite, fig. 236*B*, with posterior margin shallowly concave on median half. Male plates, fig. 387, short, apexes obliquely truncate and gently sloping to median line, the large round male valve almost obscuring the plates. Aedeagus connective twice as long as aedeagus, which is slender, curved dorsally, and bears a dorsally directed ventral process.

A transcontinental species, this is one of the most common of the grass leafhoppers and is found in greater abundance in pastures and meadows than in prairie habitats.

**Illinois Records.**—Many males and females, taken May 14 to October 1, are from Algonquin, Alton, Amboy, Antioch, Arlington Heights, Barry, Beach, Bradley, Bushnell, Champaign, Decatur, Des Plaines, Effingham, Elizabeth, Evergreen Park, Forest City, Fox Lake, Fulton, Galena, Grafton, Grand Detour, Grays Lake, Hanover, Hardin, Havana, Homer, Ingleside, Kankakee, Macomb, Marshall, Mason City, McHenry, Monmouth, Monticello, Mount

Sterling, Muncie, New Holland, New Milford, Normal, Oak Lawn, Ogden, Oquawka, Orangeville, Palos Park, Pankeyville, Parker, Port Byron, St. Anne, Savanna, Seymour, Shawneetown, Sheffield, Springfield, Summit, Texas City, Urbana, Volo, Watson, Wauconda, Waukegan, White Heath, White Pines Forest State Park, and Zinn.

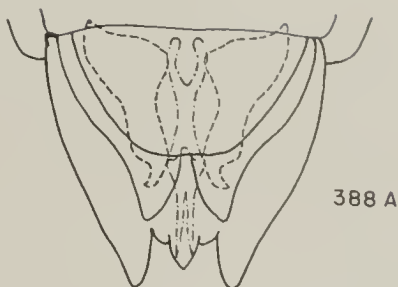
2. *Psammotettix ferratus* (DeLong & Davidson)

*Laevicephalus ferratus* DeLong & Davidson (1935, p. 170).

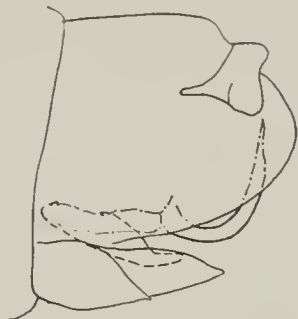
Length 3.5 mm. In size, form, and coloration this species resembles *striatus* so closely it cannot be separated by external markings or by external genital structures.

Female seventh sternite shallowly and concavely rounded as in *striatus*. Male plates, fig. 388, short and truncate. Connectives very short, in ventral view with a rounded horseshoe-shaped base; aedeagus short, angularly bent and directed upward, apex sharply pointed, appearing bifurcate in dorsal view.

This species occurs in various habitats and



388 A



388 B

Fig. 388.—*Psammotettix ferratus*, male genitalia. A, ventral aspect; B, lateral aspect.

has been taken along Lake Erie and in the Chicago area near Lake Michigan. It has also been recorded from Pennsylvania, but has been collected only in small numbers in these localities.

Illinois Records.—MACOMB: in pasture, July 3, 1934, DeLong & Ross, 1♂. ST. ANNE: July 20, 1934, DeLong & Ross, 1♂. VOLO: July 27, 1934, DeLong & Ross, 1♂, 2♀.

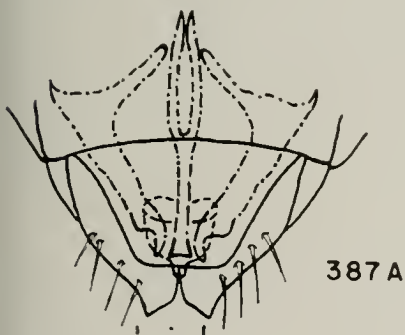
60. *AMPLICEPHALUS* DeLong

*Amplicephalus* DeLong (1926a, p. 83).

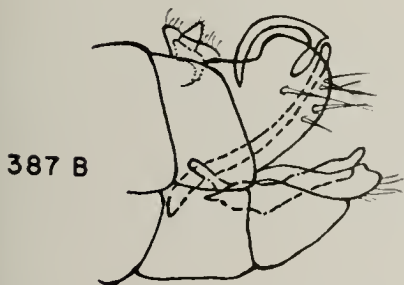
Fig. 208. Vertex transverse and broad, width between eyes greatly exceeding length at middle, strongly rounded or very broadly and bluntly angled with front. Elytra with central anteapical cell constricted and divided, and with one or two crossveins between first and second sectors. Form broad and robust.

KEY TO SPECIES

Tawny, with a row of four or six black spots just above margin of vertex. 1. *osborni*  
Green, with a transverse black band just back of yellow vertex margin. 2. *estacodus*



387 A



387 B

Fig. 387.—*Psammotettix striatus*, male genitalia. A, ventral aspect; B, lateral aspect.

### 1. *Amplicephalus osborni* (Van Duzee)

*Deltocephalus osborni* Van Duzee (1892c, p. 304).

Length 4.5–5.0 mm. Tawny yellow, with black markings. Vertex, fig. 389A, one-third broader than long, with four or six dark spots on anterior margin, the middle pair larger and prominent, the two next to each ocellus smaller, transverse, often wanting; in well-marked specimens there is usually a tawny interrupted transverse band between eyes, and an irregular spot at base on either side. Pronotum with traces of five pale longitudinal stripes. Elytral nervures white, often heavily margined with fuscous.

Female seventh sternite, fig. 389D, with posterior margin bisinuate, forming three

broadly rounded lobes, broadly margined with dark brown; lateral lobes prominent at sides. Male plates, fig. 389C, triangular, gradually narrowed to acute tips. Aedeagus in lateral view, fig. 389B, broad, apical portion inflated and narrowed to a bluntly pointed apex.

This is a fresh-water marsh species found especially in the northern states from Maine to Colorado.

**Illinois Records.**—Many males and females, taken May 8 to September 24, are from Amboy, Antioch, Beach, Clay City, Danville, Dubois, Fox Lake, Grand Detour, Havana, Oak Lawn, Oakwood, Port Byron, Princeton, Sun Lake, Volo, and Wauconda.

### 2. *Amplicephalus estacadus* (Ball)

*Athysanus estacadus* Ball (1911, p. 200).

Length 3.5 mm. Yellow to greenish, with black bands. Vertex, fig. 389A, wider than median length, with a yellow margin, just back of and parallel to which is a broad black band. Pronotum with a transverse median light band. Elytral nervures light. Female seventh sternite, fig. 389D, short, posterior margin slightly and broadly emarginate. Male plates, fig. 389C, triangular, broad at base, convexly rounding to near middle, then concave, gradually narrowing to acute tips. Aedeagus broad in ventral view, fig. 389B, and deeply bifid at apex; in lateral view it appears notched on dorsal surface near base and is tapered to a pointed apex.

This is a grass-feeding species found abundantly in pastures and meadows. It is southern in distribution and will probably be found in southern Illinois.

### 61. *ARUNDANUS* DeLong

*Arundanus* DeLong (1935b, p. 180).

Fig. 220. The genus is characterized by having the vertex produced and bluntly angled, flat, margin rather thick but distinct, not rounded to front. Venation of wing with central anteapical cell greatly elongated, constricted, and divided by a crossvein at center; outer anteapical cell usually elongated but narrow; inner anteapical cell short and rather broad.

As far as known, the 14 described species of this genus are largely confined to cane, *Arundinaria tecta*, an abundant host along stream margins or in low moist areas in the

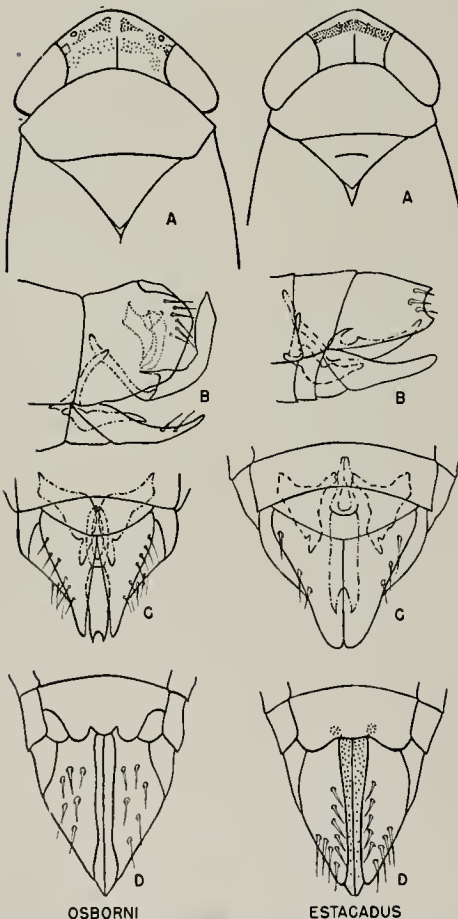


Fig. 389.—*Amplicephalus*. A, head and pronotum; B, male genitalia, lateral aspect; C, male genitalia, ventral aspect; D, female genitalia.

southeastern United States. In Illinois the cane occurs north of the Ohio River, extending to some extent over the southern fourth of the state. Records of four species have been obtained in Illinois, and several other species may occur here.

## KEY TO SPECIES

1. Yellow, orange, or brown, marked with black transverse lines or spots on margin of vertex. . . . . 2  
Color white, yellow, orange, or some shade of brown, without black spots or lines on margin of vertex. . . . . 5
2. Vertex with a black wavy line on margin or just below; margin not white, bordered with dark lines. . . . . 3  
Vertex margin white or pale, bordered with black lines above and below. . . . . 4
3. Vertex with a broad wavy line on margin, with four quadrate black spots above, fig. 390A. . . . . **1. crumbi**  
A heavy wavy line below vertex margin, an interrupted black band above, composed of three narrowly connected triangular spots on either side, fig. 390B. . . . . **2. proprius**
4. Vertex with a broken line composed of four irregular triangular spots above margin, fig. 390E. Female seventh sternite, fig. 390I, deeply and roundedly excavated at middle. Male aedeagus, figs. 390N, 390O, terminating in sharply pointed processes. . . . . **3. arundineus**  
Vertex with a wavy line above the white margin, fig. 390C. Female seventh sternite, fig. 390J, appearing trilobate. Male aedeagus, figs. 390P, 390Q, rounded, blunt at apex, dorsal process broad, serrate on truncate tip. . . . . **4. marginellus**
5. Dorsum uniform in color, deep orange in male, white in female. . . . . **5. nacreosus**  
Dorsum not uniform in color; vertex orange yellow, margin paler; elytra smoky yellow, nervures pale. . . . . **6. flavotinctus**

**1. *Arundanus crumbi* (DeLong)**

*Thamnotettix crumbi* DeLong (1916, p. 81).

Length 5.0–5.5 mm. Orange yellow, with a rather broad wavy line on anterior margin of vertex, fig. 390A, and four quadrate spots just above black, the central pair larger; vertex one-fourth longer at middle than next to eyes. Elytra yellowish, nervures orange yellow, wings smoky. Female seventh sternite, fig. 390K, broadly and angularly excavated, lateral angles produced and prominent. Male plates elongate, longer than combined basal width, gradually tapered from bases to blunt apices. Aedeagus, figs. 390R, 390S, with a long tapering ventral process

that is curved dorsally and anteriorly at apex, also a broad dorsal process, blunt at apex, extending dorsally from base of aedeagus body and curved anteriorly.

Common on *Arundinaria tecta* in Tennessee, *crumbi* should occur in southern Illinois.

**2. *Arundanus proprius* (DeLong)**

*Thamnotettix proprius* DeLong (1918b, p. 238).

Length of male 4.5 mm. Resembling *shermani* Ball (1903, p. 230), in coloration but with a more strongly produced and angled vertex, fig. 390B. Vertex a little wider between eyes at base than median length; margin pale, bordered beneath by a uniform black band and above by a band composed of three large triangular spots on each side, the central pair of spots largest and decidedly separated. Male plates, fig. 390M, long and narrow, bluntly pointed. Aedeagus in lateral view, fig. 390L, curved dorsally at apex and enlarged into a half spearhead, the enlarged portion on the caudal margin. Style with a short outwardly curved apical process.

This species is known to occur in Tennessee only.

**3. *Arundanus arundineus* (DeLong)**

*Thamnotettix arundineus* DeLong (1926b, p. 91).

Length 4.5–5.0 mm. Smoky brown, tinged with orange. Vertex, fig. 390E, bluntly angled, almost one-fourth wider between eyes than length at middle; margin pale, bordered with brown below and with a broken brownish line above, the latter composed of four irregular triangular spots; two broad orange longitudinal bands arise near margin of vertex and extend across pronotum to basal angles of scutellum. Elytra smoky subhyaline, veins whitish.

Female seventh sternite, fig. 390I, produced on either side to form a pair of broadly rounded lobes, between which the posterior margin is broadly and roundedly excavated more than half way to the base. Male valve, fig. 390O, broad, triangular, plates long and narrow, almost three times as long as valve and gradually tapering to rather sharp apices. Ventral process of aedeagus, fig. 390N, with an enlarged blunt rounded apex; dorsal portion slightly enlarged at apex, truncate and with a serrate margin.

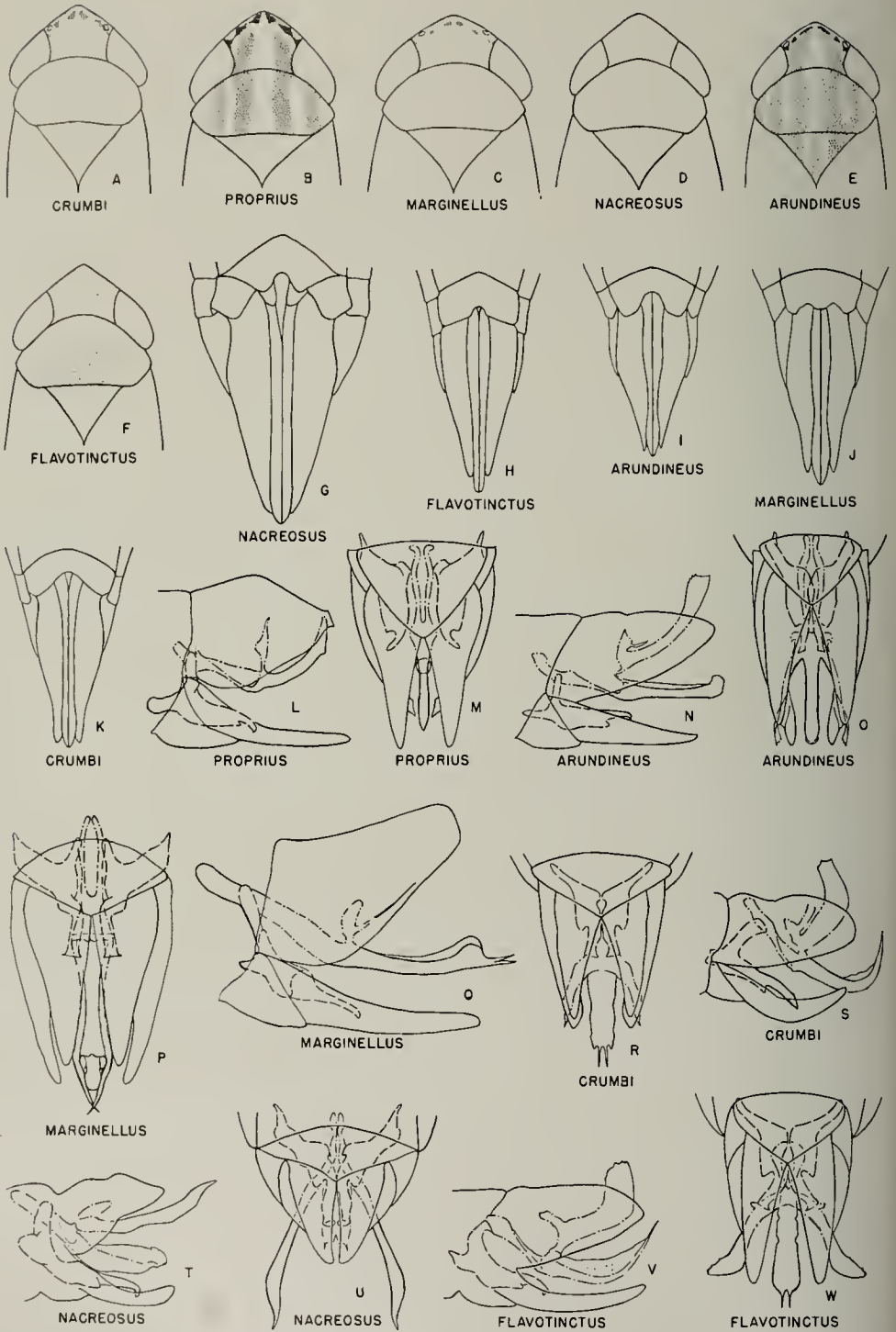


Fig. 390.—*Arundanus*. A-F, head and pronotum; G-K, female genitalia; L-W, male genitalia.

A common species on cane, *Arundinaria tecta*, *arundineus* occurs in southern Illinois and Tennessee.

**Illinois Record.**—VIENNA: June 14, 1934, DeLong & Ross, 12♂, 10♀.

#### 4. *Arundanus marginellus* DeLong

*Arundanus marginellus* DeLong (1935*b*, p. 181).

Length 5.0–5.5 mm. Tawny to grayish, tinged with orange. Vertex, fig. 390C, flat, bluntly angled, a little more than half as long at middle as width between eyes; margin of vertex conspicuously white, bordered above by brownish wavy line and below by a fainter line. Pronotum marked with four conspicuous longitudinal orange stripes. Elytra with pale veins.

Female seventh sternite, fig. 390J, long, with prominent lateral angles, posterior margin indented on either side of a broad median rounded tooth, which is produced as far as the lateral angles and is bifid at apex. Male valve, fig. 390P, broad, obtusely angled; plates long, gradually tapering to narrow acute tips. Ventral portion of aedeagus, fig. 390Q, broad, elongate, slightly enlarged just before apex, then terminating in a pair of long spinelike structures; dorsal portion composed of a long slender tapered spine.

A common species on cane, *Arundinaria tecta*, *marginellus* occurs in Illinois and Tennessee.

**Illinois Records.**—HEROD: July 6–11, 1935, DeLong & Ross, 3♂, 1♀. KARNAK: Aug. 8, 1934, 1♀. THEBES: July 11, 1935, DeLong & Ross, 6♂, 13♀. VIENNA: savanna grasses, June 14, 1934, DeLong & Ross, 30♂, 16♀; July 10, 1935, DeLong & Ross, 4♂, 7♀.

#### 5. *Arundanus nacreosus* (Crumb)

*Chlorotettix nacreosus* Crumb (1915, p. 196).

Length 5.0–5.5 mm. With distinct sexual dimorphic coloration. Male deep orange, female uniformly white. Vertex, fig. 390D, obtusely angulate, one-half longer at middle than next to eye. Female seventh sternite, fig. 390G, twice as broad as long, with posterior margin excavated half way to base by a broad triangular notch, which is interrupted on either side of middle by a pair of rounded lobes, presenting the appearance

of three distinct notches. Male valve, fig. 390U, convex anteriorly, rounded posteriorly, two and one-half times as broad as long; plates longer than broad, tips rounding. Aedeagus, fig. 390T, with a short broad blunt ventral portion and a pair of long slender bladelike structures comprising the dorsal portion.

Very abundant on cane, *Arundinaria tecta*, this species occurs in the Mississippi and Ohio river valleys in southern Illinois.

**Illinois Records.**—ELIZABETHTOWN: June 25, 1932, Ross, Dozier, & Park, 1♂. HEROD: Aug. 4, 1934, DeLong & Mohr, 1♀; June 24, 1936, DeLong & Ross, 5♂, 2♀. KARNAK: Aug. 8, 1934, DeLong & Mohr, 1♂, 1♀. VIENNA: June 14, 1934, DeLong & Ross, 54♂, 1♀; July 29, 1934, DeLong & Ross, 16♂, 21♀.

#### 6. *Arundanus flavotinctus* (DeLong)

*Thamnottix flavotinctus* DeLong (1916, p. 82).

Length 5.5 mm. Yellowish, tinged with orange, margin paler than adjacent areas. Elytra smoky yellow, nervures pale. Vertex, fig. 390E, flat, a little wider between eyes at base than median length. Female seventh sternite, fig. 390H, with posterior margin broadly and angularly excavated half way to the base, bottom of excavation brownish. Male valve, fig. 390H', almost truncated, fitting in the concavity of the seventh sternite; plates rather short and broad, a spot near outer margin at base of each. Ventral portion of aedeagus, fig. 390I', long, gradually narrowed to acutely pointed upturned apex; dorsal portion broad, enlarged, and curved dorsally before blunt apex.

Common on cane, *Arundinaria tecta*, this species is found in the Mississippi River valley.

**Illinois Record.**—VIENNA: July 10, 1935, DeLong & Ross, 2♀.

#### 62. *GRAMINELLA* DeLong

*Graminella* DeLong (1936*a*, p. 218).

Individuals of this genus usually have a produced and bluntly angled vertex with a thin margin, angled with front. Venation simple, central anteapical cell long and constricted at middle; outer anteapical cell comparatively short.

Individuals of the 14 known species of

the genus are comparatively small in size, 3.5–4.5 mm., and so far as is known are all grass feeders. They are common in the fresh- and salt-water marshes of the eastern United States, occurring especially upon the grasses of the *Spartina* association. Six species have been taken in Illinois; some of them occur on the wet and dry prairies.

## KEY TO SPECIES

1. Vertex, pronotum, and scutellum with broad longitudinal red stripes, fig. 391C  
..... **1. aureovittata**  
Without red longitudinal lines on vertex, pronotum, and scutellum.....2
2. Vertex marked with four marginal spots.....3  
Vertex without black spots, sometimes with faint brownish markings.....5
3. Row of black spots on vertex continuing through ocelli along anterior margins of eyes to antennae..... **2. nigrifrons**  
Row of black spots not continuing below the vertex margin; ocelli often pale, inconspicuous.....4
4. Length 4.5 mm. Spots on vertex large, conspicuous; female seventh sternite, fig. 391E3, with broad median sunken tooth; male plates, figs. 391E6, 391E7, one-half longer than combined basal width, apexes pointed..... **3. fitchii**  
Length not exceeding 4.0 mm. Paler in color; ocelli black, spots on vertex often faintly marked; female seventh sternite, fig. 391D3, concavely rounded, without tooth; male plates, fig. 391D6, as long as combined basal width..... **4. pallidula**
5. Female seventh sternite, fig. 391B3, with prominent sunken tooth; apical portion of male aedeagus, figs. 391B4, 391B5, concavely emarginate on ventral side before apex, and with a large black tooth on upper apical portion..... **5. mohri**  
Female seventh sternite, fig. 391A3, concavely rounded, without tooth; male aedeagus, figs. 391A4, 391A5, concave on dorsal surface, a small black tooth on ventral median portion..... **6. ouaka**

1. *Graminella aureovittata* (Sanders & DeLong)

*Thamnotettix aureovittatus* Sanders & DeLong (1920, p. 16).

Length 4 mm. Yellowish or pale brown, ocelli black, a pair of small black triangular spots at apex of vertex; two broad bright red longitudinal bands extend across vertex, pronotum, and scutellum. Elytra brownish, with pale veins. Vertex, fig. 391C1, broadly rounded, one-fourth wider between eyes

than median length and only slightly produced before outer margins of eyes.

Female seventh sternite, fig. 391C3, rather deeply and roundedly excavated on median half of posterior margin, brown bordered; underlying sternite shows conspicuously at lateral edges of seventh sternite. Male plates, fig. 391C6, short and broad, rounded. Aedeagus, figs. 391C4, 391C5, in ventral view broadened at apex and narrowly notched; in lateral view tapered to a pointed apex. Style as in fig. 391C2.

This species occurs abundantly on the wet prairies in the Chicago area. It is recorded from Florida, Massachusetts, and Illinois.

**Illinois Records.**—OAK LAWN: in lamp globe, Aug. 22, 1934, 14♂, 10♀; Aug. 23, 1934, Frison & Ross, 1♂; sand prairie, Aug. 27, 1934, 1♀; Sept. 6, 1935, T. H. Frison, 1♂. ST. ANNE: July 20, 1934, DeLong & Ross, 1♀. SUMMIT: July 17, 1935, DeLong & Ross, 1♂, 3♀; Aug. 21, 1935, DeLong & Ross, 1♂, 1♀.

2. *Graminella nigrifrons* (Forbes)

*Cicadula nigrifrons* Forbes (1885, p. 67).  
*Thamnotettix perpunctata* Van Duzee (1894b, pp. 200, 212).

Length 2.5–4.0 mm. Yellowish green, marked with black spots. Vertex bluntly angled, one-third wider between eyes than median length, with a row of black spots on anterior margin extending down on to front next to eyes. Face almost black and marked with irregular yellow spots. Elytra with pale nervures, these often bordered with fuscous.

Female seventh sternite emarginate posteriorly. Male plates short, broad at base, and narrowed to acute apices. Aedeagus rather rapidly narrowed on basal third to a long slender dorsally curved apical portion, the apex of which is blunt and bent anteriorly.

This is one of the most abundant and common of the grass-feeding species of leafhoppers in the eastern half of the United States. It can be found upon almost every lawn, pasture, and meadow and upon almost every cultivated crop.

**Illinois Records.**—Many males and females, taken May 11 to November 13, are from Albion, Algonquin, Alton, Anvil Rock,



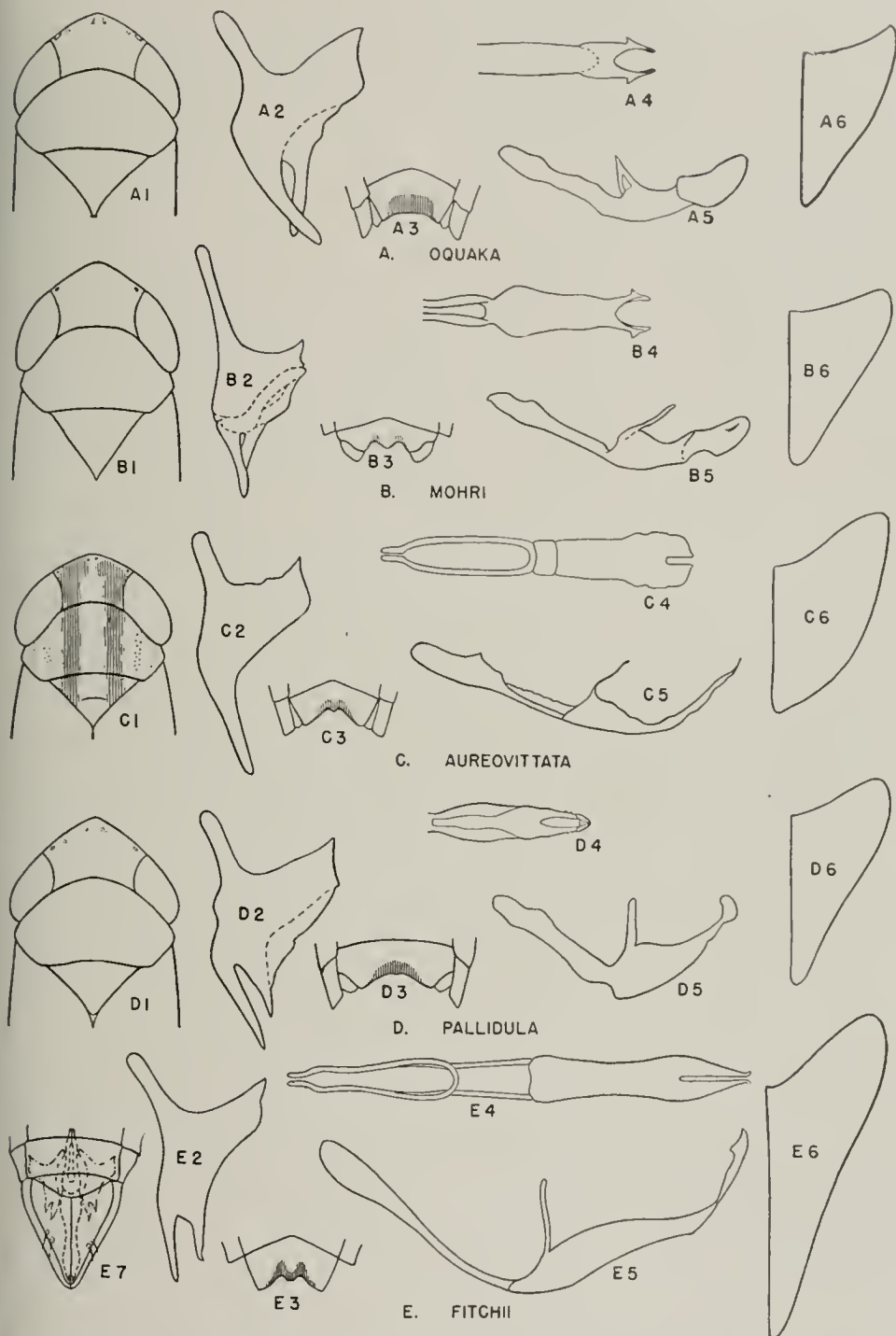


Fig. 391.—*Graminella*. 1, head and pronotum; 2, style; 3, female seventh sternite; 4, ventral view of aedeagus; 5, lateral view of aedeagus; 6, male plate; 7, ventral view of male genitalia.

Anna, Apple River Canyon State Park, Barry, Bushnell, Cache, Cairo, Carbondale, Cave in Rock, Champaign, Cobden, Collinsville, Danville, Decatur, Detroit, Dixon Springs, Dolson, Dongola, Du Quoin, East Cape Girardeau, Eichorn, Elizabethtown, Evergreen Park, Fulton, Geff, Giant City, Gibsonia, Golconda, Grafton, Gulfport, Harrisburg, Havana, Herod, High Knob, Hillsboro, Horseshoe Lake, Kampsville, Kankakee, Karnak, Lawrenceville, Lincoln, Luther, Marshall, McHenry, Meredosia, Metropolis, Mokena, Momence, Mount Carmel, Muncie, Norris City, Oak Lawn, Oakwood, Ogden, Olive Branch, Oquawka, Pike, Port Byron, Princeton, Pulaski, Putnam, Quincy, St. Anne, St. Joseph, Seymour, Shawneetown, Sparta, Sugar Grove, Temple Hill, Thomson, Urbana, Ursa, Vandalia, Vienna, Villa Ridge, Volo, Warsaw, Watson, West Union, White Pines Forest State Park, Wolf Lake, and Zion.

### 3. *Graminella fitchii* (Van Duzee)

*Thamnotettix fitchii* Van Duzee (1890a, p. 133).

Length 4.5 mm. Yellowish green, with four black spots above margin of vertex, a round one next to each ocellus and a pair of triangular spots just back of apex; vertex bluntly angled, slightly wider between eyes than median length. Elytra with pale veins.

Female seventh sternite, fig. 391E3, roundedly excavated on either side of a median slightly produced broad sunken tooth; black markings of posterior margin causing it to appear more deeply notched. Male plates, figs. 391E6, 391E7, long, gradually and concavely tapered to bluntly pointed apexes; valve with a pair of processes at apex. Aedeagus in ventral view, fig. 391E4, broad, slightly constricted at middle, enlarged on apical third, then tapered to a pair of laterally directed pointed apical processes that are formed by a deep narrow median incision; in lateral view, aedeagus, fig. 391E5, broad at base, narrowed near apex, then apparently enlarged by the curling of the apex. Style as in fig. 391E2.

This is the most common species of the genus and has been found throughout Illinois. Distributed through the eastern states and west to Kansas, it occurs in abundance in fresh-water marshes and swamps, on

rank growths of grasses, and on the moist prairies.

**Illinois Records.**—Many males and females, taken May 20 to October 5, are from Algonquin, Alton, Antioch, Apple River Canyon State Park, Beach, Detroit, Dixon Springs, Dolson, Dongola, Elgin, Fern Cliff, Fountain Bluff, Fox Lake, Fulton, Geff, Grafton, Grand Detour, Gulfport, Hamilton, Hanover, Havana, Herod, Homer, Karnak, Keithsburg, Momence, Monticello, Muncie, Newton, Norris, Oak Lawn, Olive Branch, Oquawka, Princeton, Putnam, Quincy, Rock Island, Sheffield, Spring Valley, Starved Rock State Park, Sugar Grove, Summit, Sumner, Temple Hill, Urbana, Vienna, Volo, Waltersburg, White Heath, Wilmington, and Zion.

### 4. *Graminella pallidula* (Osborn)

*Thamnotettix pallidulus* Osborn (1898, p. 245).

Length 4 mm. Pale yellow, with six black spots on or above margin of vertex, middle pair sometimes obsolete, the outer pair on margin anterior to eyes. Vertex, fig. 391D1, bluntly and roundedly angled, one and one-half times as wide between eyes at base as length at middle. Elytra pale brown or tawny, nervures paler.

Female seventh sternite, fig. 391D3, with posterior margin broadly and deeply excavated, bearing an obtuse tooth at its apex. Male plates, fig. 391D6, convexly narrowed to acute apexes. Styles, fig. 391D2, broad, with two anterior processes, which are directed outwardly. Aedeagus in ventral view, fig. 391D4, tapered to bluntly rounded apex; in lateral view, fig. 391D5, broad at base, tapered to a very narrow neck just before a rounded bulbous apex.

This species occurs on prairie grasses and is known only from Illinois and Iowa.

**Illinois Records.**—EVERGREEN PARK: Aug. 23, 1934, DeLong & Ross, 1♀. HAVANA: Aug. 8, 1934, Frison & Mohr, 1♀.

### 5. *Graminella mohri* DeLong

*Graminella mohri* DeLong (1937c, p. 50).

Length 4 mm. Yellowish, unmarked. Vertex, fig. 391B1, bluntly angled, about one-third wider between eyes than length at middle. Female seventh sternite, fig. 391B3, shallowly, roundedly excavated on

either side of a broad rounded median tooth; central half of segment brownish. Male plates, fig. 391B6, short and broad, gradually narrowed to blunt apexes. Styles, fig. 391B2, rather narrow, each with a long basal process. Aedeagus in ventral view, fig. 391B4, broad at base, slightly tapered to apical third, then enlarged; apex bearing a broad deep V-shaped notch, on either side of which is a blunt pointed apical process that is abruptly set off from body of aedeagus at base; in lateral view, the apical portion of aedeagus, fig. 391B5, constricted at base on ventral side, then enlarged; apex broadly rounded, a large black spine on anterior apical margin.

This is a common species of the sand prairies and is common along the Great Lakes and in the upper Mississippi River valley. It is recorded from Pennsylvania, Illinois, and Kansas.

**Illinois Records.**—Many males and females, taken June 26 to August 22, are from Alton, Beach, Fulton, Hanover, Mahomet, Thomson, Waukegan, and Zion.

#### 6. *Graminella oquaka* DeLong

*Graminella oquaka* DeLong (1937c, p. 51).

Length 4 mm. Pale yellow, with black ocelli and indications of four very pale spots on margin of vertex; vertex, fig. 391A1, bluntly angled, about one-third wider between eyes than length at middle.

Female seventh sternite, fig. 391A3, with central half of posterior margin broadly and roundedly excavated about one-fourth the distance to base, at the apex of which is a slightly produced broad median tooth. Male plates, fig. 391A6, rather short, broad at bases, gradually narrowed to acute apices. Each style, fig. 391A2, broad, the apical process long, curved outwardly. Aedeagus in ventral view, fig. 391A4, rather broad, slightly broader on apical third; apex broadly, deeply excavated by a U-shaped notch forming two narrow pointed apical processes that are broadened toward base and abruptly set off from body of aedeagus; in lateral view, fig. 391A5, the apical third is broadened, rounded on ventral surface; apex bluntly rounded, a black tooth on median ventral portion.

Known only from Illinois, this species occurs on bunch grass on the sand prairies of the upper Mississippi River valley.

**Illinois Records.**—HANOVER: Aug. 22, 1935, DeLong & Ross, 1♂. OQUAWKA: July 3, 1934, DeLong & Ross, 8♂, 7♀. THOMSON: June 30, 1935, DeLong & Ross, 3♂, 1♀. ZION: July 25, 1934, Frison & DeLong, 6♀.

#### 63. *AMBLYSELLUS* Slesman

*Amblysellus* Slesman (1930, p. 131).

Vertex produced, almost right angled, wider between eyes than length at middle. Front broad at apex, triangular, clypeus long. Elytra short and broad. Pronotum with a shiny band on front half.

Only one species has been placed in this genus.

#### 1. *Amblysellus curtisii* (Fitch)

*Amblycephalus curtisii* Fitch (1851, p. 61).

*Jassus nervatus* Provancher (1872, p. 378).

Length 3.5 mm. Small, greenish yellow, with black markings. Vertex, fig. 397A, sharply angled, as long as width between eyes; a pair of small black spots on apex, a pair of large shiny black spots between these and a little in front of eyes. Anterior portion of pronotum produced between the eyes, shiny black, posterior portion greenish yellow, narrowly margined with fuscous posteriorly. Elytra brown, the margins and nervures greenish yellow.

Female seventh sternite, fig. 397B, with lateral margins arising near base and produced to posterior margin, which is slightly excavated on either side of a short rounded median lobe; lobes of underlying membrane visible at either side. Male plates, fig. 398A, as long as combined basal width, gradually narrowed to acutely pointed apices. Aedeagus as in fig. 398B.

This is a common species in bluegrass meadows and pastures, also on small grains and legumes in Illinois. It occurs in the northeastern states, Tennessee, and in many parts of the Middle West.

**Illinois Records.**—Many males and females, taken June 2 to November 29, are from Algonquin, Antioch, Apple River Canyon State Park, Bloomington, Carbondale, Champaign, Dolson, Fox Lake, Galena, Ingleside, Kankakee, New Milford, Oakwood, Pecatonica, Rock Island, Rockton, Urbana, White Heath, White Pines Forest State Park, and Wilmington.

64. *UNOKA* Lawson

*Unoka* Lawson (1928, p. 456).

Fig. 225. Related to *Driotura*, but with vertex more angularly produced, almost as long as basal width, and with sloping vertex more broadly rounded to front. The pronotum is slightly longer than vertex. The brachypterous elytra extend to the pygofers, and the macropterous wings extend beyond the tip of the abdomen, forming three ante-apical cells, which are distinct in both forms of elytra; apical cells absent in brachypterous form.

Only one species, *ornata*, is known in this genus, and it has not been recorded for Illinois. However, several species of leafhoppers with western distribution similar to *ornata* have been taken on the sand prairies in Illinois along the Mississippi River, and it may be collected at some future time in the western portion of the state.

1. *Unoka ornata* (Gillette)

*Athysanus ornatus* Gillette (1898a, p. 29).

Length 2-3 mm. Vertex bluntly angled, wider between eyes than median length, and broadly rounded with front. Pronotum two and one-half times as wide as long and slightly longer than vertex. Elytra reaching to pygofers in brachypterous form and produced beyond abdomen in macropterous form. Face, vertex, pronotum, and scutellum black. Posterior two-thirds of pronotum and apex of scutellum yellow. Elytra milky white, with three black transverse bands: a narrow basal one, a wider median one, and a wide apical one; in brachypterous specimens the apical black band covers the apex of the elytra; in macropterous specimens, fig. 225, there is white coloration beyond the apical black band.

Female seventh sternite with posterior border broadly emarginate, emargination with two small rounded median teeth. Male valve long, angled at apex; plates elongate, triangular, exceeding pygofers, slightly and concavely rounded to acute tips.

This species occurs in Kansas and Nebraska on short grasses.

65. *UNERUS* DeLong

*Unerus* DeLong (1936a, p. 219).

Closely related to *Deltocephalus*. The general appearance is deltocephaloid but it

differs from the species of *Deltocephalus* by having only one crossvein between the two sectors instead of two crossveins. The vertex is bluntly angled and rounded to front, without a prominent margin. The genitalia are similar to those of *Deltocephalus*. A single species, *colonus*, is recognized for this genus.

1. *Unerus colonus* (Uhler)

*Deltocephalus colonus* Uhler (1895, p. 80).  
*Deltocephalus comatus* Ball (1900c, p. 343).  
*Athysanus villicus* Crumb (1915, p. 194).

Length 2.5-3.0 mm. Yellowish, with two large round black spots on anterior margin of the vertex and two dark points at apex. Vertex as long as basal width. Front yellow, tinged with orange. Pronotum yellow; a transverse band on the anterior margin and a broad one on the posterior margin orange. Elytra yellowish hyaline. Abdomen orange above, venter pale. Female seventh sternite emarginate posteriorly, emargination with a small median tooth. Male plates gradually narrowed to acute tips.

This is a common meadow and pasture species in the eastern United States.

**Illinois Records.**—CAVE IN ROCK: Oct. 2, 1934, Frison & Ross, 6♂, 7♀; July 9, 1935, Ross & DeLong, 1♂, 1♀. DIXON SPRINGS: July 29, 1934, DeLong & Mohr, 1♀. EICHORN: June 13, 1934, DeLong & Ross, 2♀. GOLCONDA: Sept. 4, 1924, T. H. Frison, 1♀. VIENNA: on grass, June 14, 1934, DeLong & Ross, 4♂, 1♀; Aug. 3, 1934, DeLong & Mohr, 14♂, 4♀.

66. *GILLETTIELLA* Osborn

*Gillettella* Osborn (1930, p. 689).

Figs. 210, 233A. This genus is characterized by a head that appears conical; elytra short, and ovipositor long in the female.

Three species are at present placed in this genus, none of which has been collected in or recorded for Illinois. However, since they occur in states just west of Illinois, at least one species may be found in the short grass areas of the state.

1. *Gillettella atropuncta* (Gillette)

*Deltocephalus atropunctus* Gillette (1898a, p. 28).

Length of male 2 mm.; female 4 mm. Small, with a produced vertex that bears

a black spot at apex. Vertex sharply produced, margins rounded to front, about twice as long at middle as basal width between eyes. Color dull gray, with a black spot at apex of vertex. Pronotum with a transverse row of dark spots anteriorly.

Female seventh sternite with the posterior margin rounded to small lateral processes, margin slightly excavated between lateral processes on either side of a broad rounded middle portion, which is produced the length of lateral processes. Male pygofers with apexes broadly rounded. Valve as long as preceding segment, apex sharply angled. Plates broad at bases, inner margins contiguous, outer margins rounded to sharp apices medially. Each style narrowed on outer third; aedeagus long and slender, in lateral view bent dorsally into a semicircle.

This species has been recorded from Kansas, Nebraska, Colorado, and Texas.

#### 67. *STIRELLUS* Osborn & Ball

*Stirellus* Osborn & Ball (1902, p. 250).

Vertex conically produced, narrow, longer at middle than width between eyes, disc convex, sloping, and merging with front. Elytra short and broad, venation simple. Ovipositor exceeding pygofers.

Thomas (1933) and subsequent authors recorded seven species and two varieties of *Stirellus* for the United States, and two of these occur in Illinois.

#### KEY TO SPECIES

Vertex, fig. 395*A*, greenish, with apex broadly black; elytra greenish yellow, striped with black ..... 1. *bicolor*  
 Vertex, fig. 396*A*, brown, with four spots arranged in two pairs, one pair posterior to the others, the anterior pair larger and sometimes confluent; elytra brownish, not striped ..... 2. *obtusus*

#### 1. *Stirellus bicolor* (Van Duzee)

*Athisanus bicolor* Van Duzee (1892*b*, p. 114).  
*Deltoccephalus virgulatus* Uhler (1895, p. 78).

Length 3.0–3.5 mm. Small, color quite variable, usually greenish yellow, marked with black. Vertex, fig. 395*A*, acutely and conically pointed, as long at middle as width between eyes. Vertex with a pair of black spots before middle, often confluent and covering anterior half. Pronotum with a dark band on anterior portion, often extending across base of elytra. Elytra each with

claval suture, margins of suture, and apical margin dark fuscous, in male often entirely fuscous; nervures indistinct. Female seventh sternite, fig. 395*B*, with posterior margin broadly and shallowly concave. Male plates, fig. 400, short, narrowed to broad blunt apexes, which are about half as wide as bases.

This is a common meadow species throughout the state and is frequently found upon clover, alfalfa, and other crops. It is widely distributed in the eastern and middle western parts of the United States.

**Illinois Records.**—Many males and females, taken June 14 to October 2, are from Albion, Alton, Alto Pass, Anna, Brownfield, Carbondale, Cave in Rock, Cobden, Dixon Springs, Dongola, Dubois, Elizabethtown, Fern Cliff, Fountain Bluff, Gibsonia, Grafton, Grand Tower, Harrisburg, Havana, Herod, Jonesboro, Karnak, Luther, Makanda, Marshall, Metropolis, Oakwood, Odin, Shawneetown, Temple Hill, Thebes, Urbana, Vienna, and Wolf Lake.

#### 2. *Stirellus obtutus* (Van Duzee)

*Athisanus obtutus* Van Duzee (1892*b*, p. 115).

Length 3.0–3.5 mm. Brownish, with four spots on disc of vertex. Vertex, fig. 396*A*, as long at middle as basal width between eyes, with four spots between eyes, the anterior pair darker and usually larger than the posterior pair. Pronotum with a row of brownish spots on anterior margin often confluent. Elytra brownish subhyaline, nervures pale. Female seventh sternite, fig. 396*B*, with posterior margin broadly, shallowly excavated. Male plates, fig. 399, convexly rounded to broad blunt apexes, which are about half as wide as basal width.

Although southern in distribution, this is a common species upon grasses in most parts of Illinois. It is abundant in meadows and pastures and upon cultivated crops of many types.

**Illinois Records.**—Many males and females, taken April 16 to December 4, are from Anvil Rock, Carbondale, Carmi, Cave in Rock, Centralia, Clay City, Cobden, Dixon Springs, Dolson, Dongola, Dubois, East Cape Girardeau, Elizabeth, Fern Cliff, Gibsonia, Golconda, Hardin, Heathsville, Herod, Karbers Ridge, Marshall, Mounds, Murphysboro, Norris City, St. Anne, Shawneetown, Urbana, Vienna, Watson, and Wolf Lake.

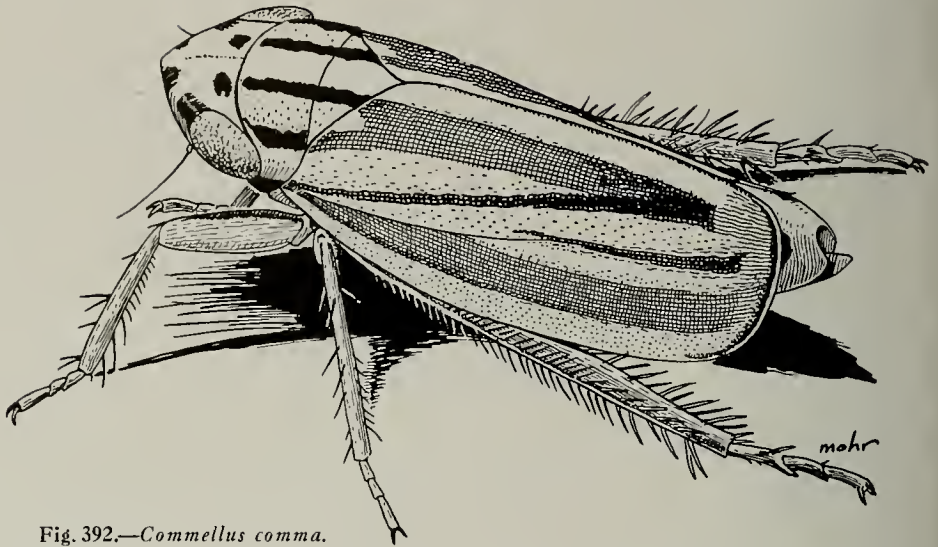


Fig. 392.—*Commellus comma*.

68. *COMMELLUS* Osborn & Ball

*Commellus* Osborn & Ball (1902, p. 245).

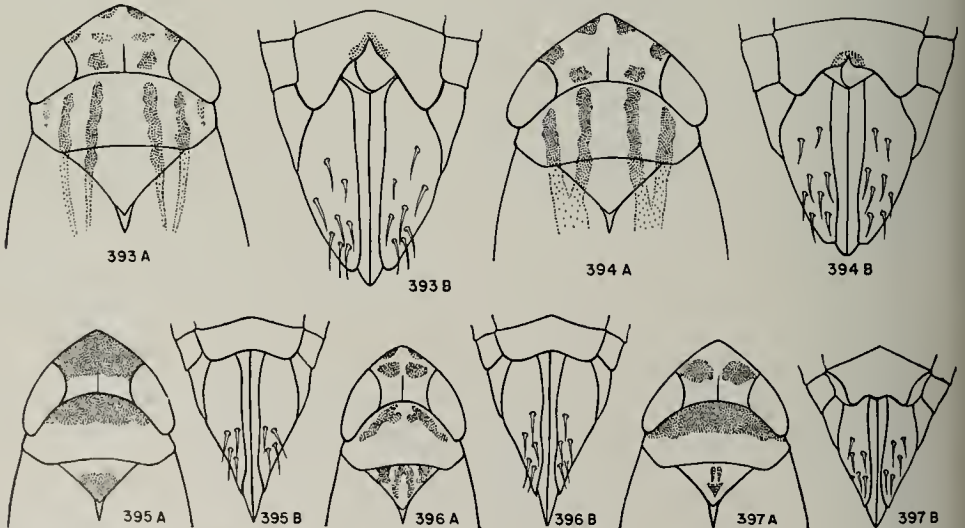
Fig. 392. Form broad and stout. Vertex flattened above, produced in front of eyes, acutely angled with front. Elytra of two forms shorter or decidedly longer than abdomen. Second cross nervure often present.

Four species have been placed in this

genus, and all are prairie forms. Two of them have been found in Illinois.

KEY TO SPECIES

Elytra marked with four distinct, separate stripes; two stripes on pronotum, fig. 394*A*, fused to form stripe on clavus . . . 1. *comma*  
 Elytra marked with eight distinct and separate stripes; two stripes on pronotum, fig. 393*A*, forming two separate narrower stripes on clavus . . . 2. *colon*



*A*, head and pronotum; *B*, female genitalia.

Fig. 393.—*Commellus colon*.

Fig. 394.—*Commellus comma*.

Fig. 395.—*Stirellus bicolor*.

Fig. 396.—*Stirellus obtutus*.

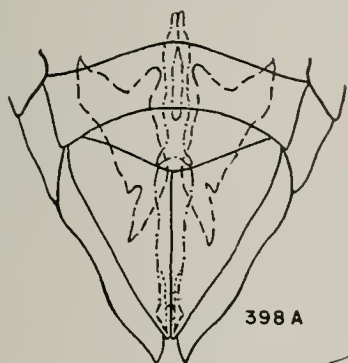
Fig. 397.—*Amblysellus curtisii*.

1. *Commellus comma* (Van Duzee)

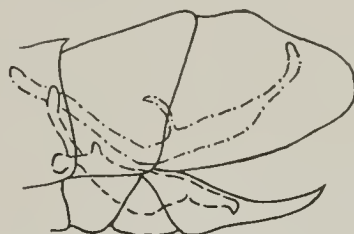
*Athysanus comma* Van Duzee (1892*b*, p. 114).

Fig. 392. Length 4.5–5.0 mm. Broad, stout, creamy white, marked with brown.

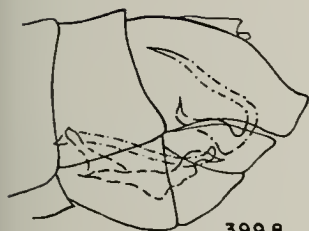
Vertex, fig. 394*A*, obtusely angulate, two-thirds as long as basal width between eyes; four black spots on anterior margin extending onto face; a pair of black spots at base of vertex. Pronotum and scutellum with



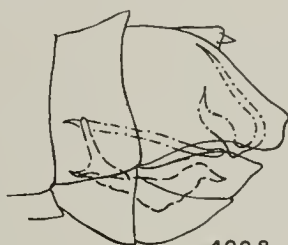
398 A



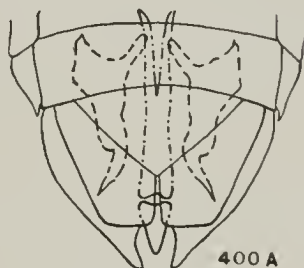
398 B



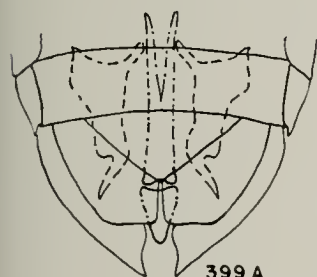
399 B



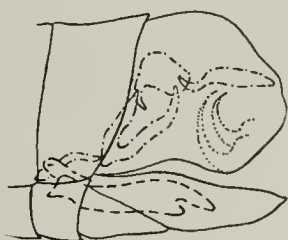
400 B



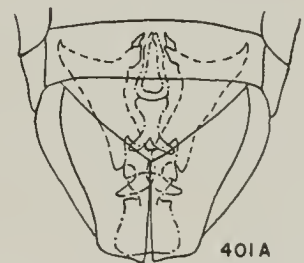
400 A



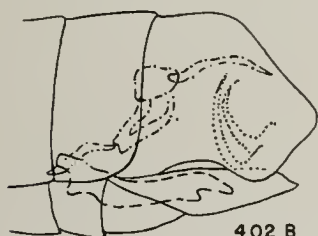
399 A



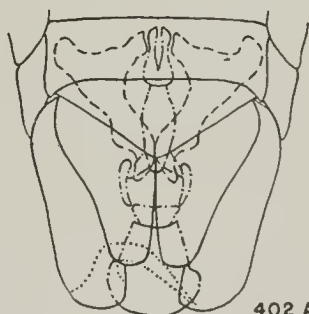
401 B



401 A



402 B



402 A

Male genitalia. *A*, ventral aspect; *B*, lateral aspect.

Fig. 398.—*Amblysellus curtisii*.

Fig. 399.—*Stirellus obtutus*.

Fig. 400.—*Stirellus bicolor*.

Fig. 401.—*Commellus comma*.

Fig. 402.—*Commellus colon*.

four parallel longitudinal stripes. Elytra creamy white, the two bands from pronotum coalescing and extending across each clavus; a broad brown band on claval suture and a narrower band on inner branch of first sector. Female seventh sternite, fig. 394B, with prominent posterior angles, between which the posterior margin is deeply, concavely excavated with a shallow black-margined incision at apex. Male plates, fig. 401, narrowed at apex to about half their basal width; apices broad and blunt.

This is a middle western and northeastern species, and in Illinois occurs in the same association as *Dorycephalus platyrhynchus*. It is reported by Osborn & Ball (1897) as occurring on *Elymus canadensis*, but has not been definitely associated with this species of plant in Illinois.

**Illinois Records.**—DECATUR: June 29, 1935, Frison & Mohr, 19♂, 14♀. GALENA: July 10, 1934, DeLong & Ross, 2♀. LILLY: June 11, 1914, 1♀. ST. JOSEPH: June 27, 1915, 1♀. WESTERN SPRINGS: Aug. 16, 1936, 1♀. ZION: July 25, 1934, H. H. Ross, 1♀.

## 2. *Commellus colon* (Osborn & Ball)

*Athysanus colon* Osborn & Ball (1897, p. 223).

Length 4.5–5.0 mm. Pale, resembling *comma* but with more dark stripes on the elytra. Vertex, fig. 393A, two-thirds as long as width between eyes. Vertex, pronotum, and scutellum with spots and stripes as in *comma*. Each elytron with eight brownish stripes as follows: three on clavus, two of which are continuous with stripes on pronotum and scutellum, one on commissural line, and four on disc of elytron.

Female seventh sternite, fig. 393B, with posterior margin deeply and angularly excavated, black margined at apex. Male plates, fig. 402, short, broad, narrowed to about half their basal width at apices, which are broadly rounded.

This is a distinctly marked species, and the eight stripes on the elytra and the characters of the internal male genitalia serve to separate it from *comma*. A prairie species that occurs on *Stipa spartea*, *colon* is known to occur only in the states of Iowa, Minnesota, and Illinois.

**Illinois Records.**—ELGIN: prairie hill, Aug. 10, 1945, Ross & Sanderson, 12♂, 7♀; Aug. 1, 1944, Ross & Sommerman, 2♀.

## 69. *DORATURA* Sahlberg

*Doratura* Sahlberg (1871, p. 291).

Fig. 240. The vertex is rounded, shorter at middle than width between eyes. The anterior margin of vertex is rather sharply angled, slightly overhanging the front; slightly depressed just behind the middle of disc of vertex. The ovipositor is long and slender.

One species of this genus is known to have been imported from Europe and is well established in Wisconsin.

### 1. *Doratura stylata* (Boheman)

*Athysanus stylatus* Boheman (1847, p. 31).

Length 3.5–4.0 mm. Gray to brownish, with three conspicuous black spots on anterior margin of vertex. Vertex broadly rounded, produced at middle, more than half as long at middle as basal width between the eyes, longer than pronotum. Elytra short, leaving most of abdomen exposed. Dorsal portion of abdominal segments with a series of spots or dots that usually form longitudinal rows. Face pale, marked with two rather broad conspicuous transverse black bands. Female seventh sternite broad, with posterior margin truncate, not produced. Ovipositor long, slender, decidedly longer than pygofers. Male plates short, rather broad, rounded.

This species has not been collected in Illinois.

### 70. *DRIOTURA* Osborn & Ball

*Driotura* Osborn & Ball (1898, p. 87).

Fig. 403. Head short, transverse, almost parallel margined, obtusely conical. Eyes large, face short and broad. Pronotum short, transversely striate posteriorly. Elytra coarsely rugose, short, extending either to second abdominal segment only or almost to end of abdomen.

The members of this genus are grass-feeding species and are found in pastures or prairie habitats. Three species and three varieties are known for the United States. Three of these have been taken in Illinois, and one other may occur here.

#### KEY TO SPECIES

1. Black, reddish brown, or in part tawny yellow.....2



- Gray, vertex and pronotum marked with white..... 1. **robusta**
- 2. Vertex and pronotum reddish brown..... 3. **gammaroides** var. **fulva**
- Vertex and pronotum black..... 3
- 3. Shiny black, without definite pale markings..... 2. **gammaroides**
- Black, with elytra and last two or three segments of abdomen tawny yellow.... 4. **gammaroides** var. **flava**

1. *Driotura robusta* Osborn & Ball

*Driotura robusta* Osborn & Ball (1898, p. 87).

Length 2.75–3.5 mm. Small, robust, gray, with light bands on pronotum. Vertex short, transverse, almost parallel margined, twice as wide as long; a median longitudinal line, two spots on disc, a band between vertex and front, and a stripe on base with white lines extending forward from it along the eyes. Face with a black band near clypeus, pale above, with dark arcs. Pronotum with anterior third black, white posteriorly, often bordered with black on lateral margins. Elytra black, with nervures and ramose lines connecting them light. Light colored specimens almost white.

Female seventh sternite slightly emarginate posteriorly. Male plates with inner margins rounded, outer edges emarginate, apexes obtuse, widely separated.

This species occurs on small grasses and is frequently found in certain meadow or prairie habitats. It is recorded from the Middle West, but is not yet known from Illinois.

2. *Driotura gammaroides* (Van Duzee)

*Athysanus gammaroides* Van Duzee (1894b, p. 209).

Fig. 403. Length 3–4 mm. Short, black, robust, with long or short elytra. Vertex bluntly conical, twice as wide as long; usually glossy black, often with scattered reddish-brown markings. Legs and spines often reddish brown. Female seventh sternite broadly and convexly rounded. Male plates with outer margins convexly rounded to bluntly pointed apexes.

This is a common grass-feeding species in meadows and pastures east of the Rocky Mountains.

**Illinois Records.**—Many males and females, taken April 10 to September 27, are from Adair, Alsip, Alton, Barry, Beach, Carlinville, Cave in Rock, Danville, Dar-

win, Dolson, Dongola, Dubois, Effingham, Eichorn, Elizabethtown, Evergreen Park, Grafton, Golconda, Havana, Karnak, Kin-

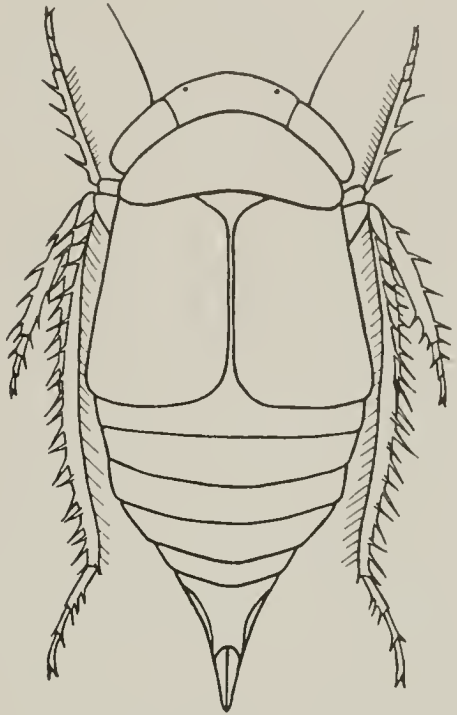


Fig. 403.—*Driotura gammaroides*.

mundy, Marshall, Metropolis, Mozier, Muncie, Niota, Oak Lawn, Oquawka, Parker, Pulaski, Shawneetown, Summit, Thebes, Thomson, Ursa, Vienna, and Zion.

3. *Driotura gammaroides* var. **fulva** Ball

*Driotura gammaroides* var. **fulva** Ball (1903, p. 231).

The coloration of this variety is reddish brown on vertex, pronotum, the last two segments of abdomen, pygofers, and ventral surface. The elytra and the remainder of the abdominal segments are almost uniform dark brown.

This variety is found in fewer numbers but in the same habitat as typical *gammaroides*.

**Illinois Records.**—DONGOLA: Aug. 22, 1916, 1 ♀. DUBOIS: Aug. 9, 1917, 1 ♂, 1 ♀. METROPOLIS: Aug. 20, 1916, 2 ♂, 1 ♀. MOZIER: July 28, 1936, Mohr & Burks, 3 ♂, 1 ♀. MUNCIE: cattail bog, Aug. 20, 1936,

B. D. Burks, 1♂. NIOTA: dry bog, July 28, 1936, Mohr & Burks, 1♀. URSA: July 29, 1936, Mohr & Burks, 1♀.

4. *Driotura gammaroides* var. *flava*  
Osborn & Ball

*Driotura gammaroides* var. *flava* Osborn & Ball (1898, p. 90).

Vertex, pronotum, and basal portion of abdomen black. The elytra and last two or three segments of abdomen yellow.

This variety occurs in the same habitats and in association with typical *gammaroides* and var. *fulva*.

Illinois Records.—Males and females, taken June 21 to August 23, are from Barry, Dubois, Evergreen Park, Kinmundy, Metropolis, Oak Lawn, Oquawka, Parker, Thomson, Vienna, and Zion.

71. *ATHYSANELLA* Baker

*Athysanella* Baker (1898c, p. 185).  
*Nephotettix* Matsumura (1902, p. 378).

Fig. 237. Head wider than pronotum, vertex somewhat produced, obtusely angulate, rounded to front, somewhat depressed on disc. Each hind tibia in male with or without strong spine at apex; spine, if present, about half as long as first tarsal segment.

Ball & Beamer (1940) recorded 45 species of *Athysanella*, including the subgenus *Amphipyga*, from the United States. Most species of this group are distributed from Kansas west to California, but two species of *Amphipyga* are known to occur in Illinois, and at least one *Athysanella* may occur here.

KEY TO SPECIES

1. Each hind tibia of male with spur at apex ..... 1. **robusta**  
Each hind tibia of male without apical spur..... 2
2. Males..... 3  
Females..... 4
3. Plates, fig. 404A, longer than wide, sinuate on sides; elytra marked with faint lines ..... 2. **acuticauda**  
Plates, fig. 404B, wider than long, angled on sides; elytra marked with broad stripes..... 3. **balli**
4. Seventh sternite broadly emarginate or subtruncate on posterior margin, sometimes indented at middle, and with a broad median longitudinal dark band ..... 2. **acuticauda**

Seventh sternite broadly rounded or subtruncate on posterior margin, distinctly emarginate on inside of lateral angles, and with a very narrow posterior marginal dark band..... 3. **balli**

1. *Athysanella robusta* Baker

*Athysanella robusta* Baker (1898c, p. 187).

Length 3.0–3.75 mm. Pale gray, with two shiny black spots near the eyes, also brown spots at apex of vertex and on the disc. Pronotum with three pairs of black dots near the front margin. Elytra with veins whitish, cells somewhat infuscated. Abdomen striped. Female seventh sternite deeply excavated, median lobe about half as long as lateral lobes. Male pygofers rounded, subangulate on posterior borders. Plates short, half as long as pygofers, divergent, rounded posteriorly. Styles elongate, each with two long widely separated spurs curved at tips.

Although this species has not been collected in Illinois, it occurs in Iowa and Nebraska and will probably be found in the western or northwestern part of the state.

Subgenus *Amphipyga* Osborn

*Amphipyga* Osborn (1928, p. 289).

Vertex short, rounded or slightly angulate, usually with two conspicuous black spots or lines between the ocelli. Males without tibial spurs. Female ovipositor extremely long, extended beyond pygofers. Male pygofers inflated or elongate.

Most of the species of this subgenus are western and only two are known to occur in Illinois. They live on very short grasses and are found abundantly in the plains or short-grass region, or on the short grasses of the barren-appearing sandy plains.

2. *Athysanella (Amphipyga) acuticauda*  
Baker

*Athysanella acuticauda* Baker (1898c, p. 187).

Length 3–4 mm. Dull greenish to brownish, robust. Vertex blunt, angularly or roundedly produced, with a pair of large round black spots extending to front, and with a spot on middle of front visible from above. Elytra usually short, covering only basal two or three segments of abdomen, occasionally reaching almost to tip of abdomen; elytra often striped with brown, abdomen marked with brownish spots and darker

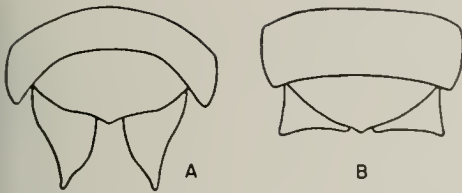


Fig. 404.—*Athysanella*, male plates. *A*, *acuticauda*; *B*, *balli*.

areas. Female seventh sternite emarginate posteriorly on either side of a slightly produced broad median lobe. Male plates, fig. 404*A*, short and broad, divergent, notched on outer margins, apices bluntly pointed.

A common species in dry upland pastures and prairie habitats, *acuticauda* is the most common and widely distributed of all the species of the subgenus. It occurs from Maine to Colorado and Montana.

**Illinois Records.**—Many males and females, taken May 10 to August 28, are from Apple River Canyon State Park, Evergreen Park, Galena, Grand Detour, St. Anne, Volo, Warren, Wauconda, and Zion.

### 3. *Athysanella (Amphipyga) balli* (Osborn)

*Amphipyga balli* Osborn (1928, p. 289).

Length 3 mm. Light gray, resembling *acuticauda* in form and size. Vertex broad, slightly angled and as long as pronotum, with a round black spot on each side of apex extending to front, and with a small black dot at apex. Elytra dark brown, veins white so that elytra appear longitudinally striped. Female seventh sternite truncate or slightly sinuate. Male plates, fig. 404*B*, short triangular, sinuate on inner margins, apices blunt.

This species has been taken in prairie habitats and in barren sandy areas on sparse patches of short grass. It occurs also on dry upland pastures and in meadows. It was previously recorded from Iowa and Ohio.

**Illinois Record.**—ALTON: June 27, 1934, DeLong & Ross, 10 ♀.

## 72. *EXITIANUS* Ball

*Exitianus* Ball (1929, p. 5).

Fig. 216. Characterized by a bluntly angled vertex, convex between eyes, anterior margin rounded to front, and front not inflated. Venation of elytra simple, apical cells much longer than broad; appendix of each elytron broad. Ovipositor extremely

long, acutely produced, greatly exceeding the slender pygofer.

Only one of the two species of this genus is known to occur in Illinois.

### 1. *Exitianus obscurinervis* (Stål)

*Thamnotettix obscurinervis* Stål (1858, p. 293).

*Cicadula exitiosa* Uhler (1880, p. 72).

*Athysanus miniaturatus* Gibson (1919, p. 26).

Length 3.5–5.0 mm. Variable in color and markings. Vertex obtusely angled, almost twice as wide at base as median length; vertex pale grayish white, often tinged with orange yellow; ocelli red, a pair of large round black spots on the margin, often a smaller one between these two, also two oblique dashes on basal angles, a transverse crescent mark between the anterior extremities and parallel to the anterior margin. Pronotum with irregular black spots. Triangular spots in basal angles of scutellum brown. Elytra hyaline, nervures dark fuscous.

Female seventh sternite, fig. 287*C*, with posterior margin subtruncate, slightly, convexly produced at middle. Male plates, fig. 287*A*, long, narrow, gradually tapering outer margins slightly concave, tips acute, often divergent. Aedeagus as in fig. 287*B*.

This is a very common and abundant species throughout the United States on several types of plants. It occurs especially on grasses, and attacks many cultivated crops, particularly small grains and legumes.

**Illinois Records.**—Many males and females, taken May 7 to November 22, are from Alton, Anvil Rock, Bloomington, Bradley, Carman, Cave in Rock, Champaign, Chicago, Collinsville, Danville, Decatur, Dongola, Dubois, East Cape Girardeau, Evergreen Park, Fern Cliff, Gibsonia, Golconda, Grand Detour, Harrisburg, Havana, Herod, High Knob, Jonesboro, Mahomet, Marshall, Mason City, Mederosia, Metropolis, Monmouth, Moweaqua, Niota, Norris City, Oak Lawn, Onarga, Oquawka, Palos Park, Port Byron, Quincy, Springfield, Starved Rock State Park, Thomson, Topeka, Urbana, Vienna, Villa Ridge, Watson, White Heath, and Zion.

## 73. *EUSCELIS* Brullé

*Euscelis* Brullé (1832, p. 109).

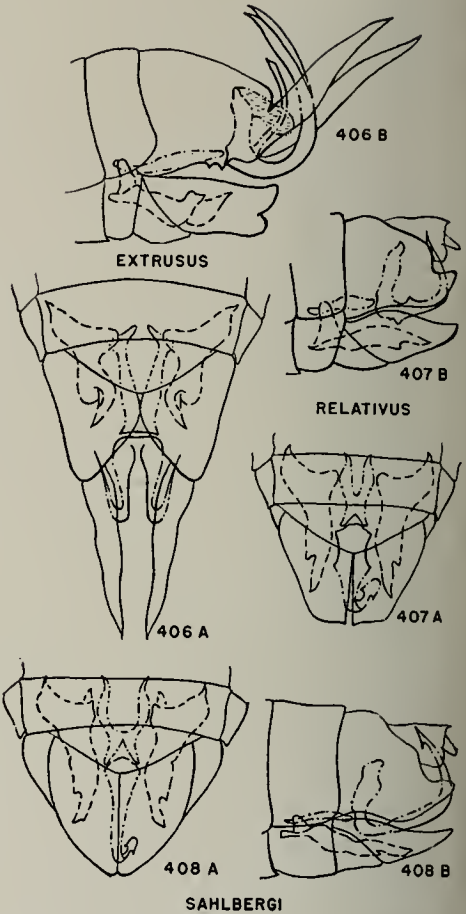
Body broad and robust. Vertex bluntly and conically produced, disc between eyes

convex, margin thick, rounded to front. Elytra broad, usually shorter than abdomen, second cross nervure often present, apical cells short and broad.

Eight species of this genus are known for the United States, and two are recorded for Illinois. At least one other species may occur here.

KEY TO SPECIES

1. Length not exceeding 4 mm. Each male plate, fig. 407A, truncate at apex; excavation of female seventh sternite, fig. 405A, with a prominent apical tooth..... 1. *relativus*  
Length 5 mm. or more. Each male plate not truncate at apex; tooth in excavation of female seventh sternite, if present, very small..... 2
2. Vertex, fig. 405B, broadly rounded, less than half as long at middle as width between eyes. Each male plate, fig.



Figs. 406-408.—*Euscelis*, male genitalia, A, ventral aspect; B, lateral aspect.

408A, with bluntly rounded apex; excavation of female seventh sternite, fig. 405A, angular and with a minute black tooth..... 2. *sahlbergi*  
Vertex, fig. 405B, obtusely angled, almost three-fourths as long at middle as width between eyes. Each male plate, fig. 406A, with blunt divergent apex. Female seventh sternite, fig. 405A, with basal margin of excavation broadly and roundedly produced..... 3. *extrusus*

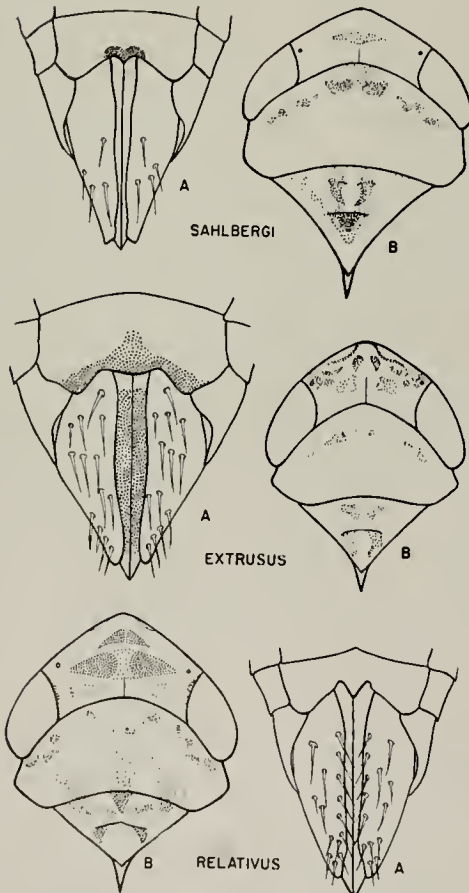


Fig. 405.—*Euscelis*. A, female genitalia; B, head and pronotum.

I. *Euscelis relativus* (Gillette & Baker)

*Athysanus relativus* Gillette & Baker (1895, p. 93).

Length 4 mm. Short, stout, pale brownish to straw colored, marked with fuscous. Vertex, fig. 405B, obtusely angled, a little more than half as long as basal width between the eyes, often with a few irregular pale markings. Ocelli red. Elytra subhya-

line, nervures indistinct. Female seventh sternite, fig. 405*A*, with lateral angles rounded to posterior margin, which is rather deeply and roundedly excavated; apex with a black acutely pointed tooth. Male plates, figs. 407*A*, 407*B*, about as long as combined basal width, narrowed to about half their width at apex, which are broad and truncate.

This is a grass-feeding species recorded from the northeastern states. It has been taken from timothy, and apparently its habitat conditions are quite similar to those of *extrusus* and *sahlbergi*.

## 2. *Euscelis sahlbergi* (Reuter)

*Athysanus sahlbergi* Reuter (1880, p. 220).  
*Euscelis deceptus* Sanders & DeLong (1917, p. 87).

Length 5.5–6.0 mm. Yellowish, marked with brown. Vertex, fig. 405*B*, broadly rounded, more than twice as wide between eyes as median length; with irregular transverse brown markings. Ocelli red. Pronotum and scutellum with irregular brown spots. Elytra dull yellow, with indistinct nervures and brownish markings. Female seventh sternite, fig. 405*A*, with lateral angles rounded to a broadly and angularly excavated posterior margin that bears at its apex a short median black tooth. Male plates, figs. 408*A*, 408*B*, broad, convexly rounded to blunt apices.

This species occurs in the New England states and west to South Dakota, and is found in fresh-water marshes.

**Illinois Records.**—DES PLAINES: Sept. 4, 1935, Frison & DeLong, 1 ♂. FOX LAKE: June 26, 1936, Frison & DeLong, 2 ♂, 1 ♀; June 30, 1935, DeLong & Ross, 1 ♂; Aug. 12, 1937, Ross, 3 ♂. GRAYS LAKE: June 10, 1936, Ross & Burks, 1 ♂, 1 ♀. OAK LAWN: summer, 1934, at light, 1 ♀. VOLO: in bog, June 11, 1936, Ross & Burks, 1 ♂. ZION: July 16, 1935, DeLong & Ross, 1 ♀.

## 3. *Euscelis extrusus* (Van Duzee)

*Athysanus extrusus* Van Duzee (1893, p. 283).

Length 5–6 mm. Broad, stout, yellowish, with dark markings. Vertex, fig. 405*B*, obtusely angled, almost three-fourths as long as width between eyes, with a pair of oblique fuscous spots at apex and a transverse spindle-shaped spot between eyes. Pronotum and scutellum with irregular

markings. Elytra pale yellow, nervures paler, areoles margined with fuscous; in pale specimens, markings often faint or wanting. Female seventh sternite, fig. 405*A*, with lateral lobes pointed, posterior margin rather broadly and deeply excavated, the margin of excavation slightly produced at middle. Male plates, figs. 406*A*, 406*B*, with outer margins sloping, inner margins divergent, forming blunt almost rounded apices.

This species, previously recorded from the northeastern states, occurs in moist habitats on grasses. It has been taken in low wet pastures and meadows and is frequently found in fresh-water marshes.

**Illinois Records.**—ELIZABETH: July 7, 1917, 1 ♀. GRAND DETOUR: July 2, 1934, DeLong & Ross, 1 ♀. OAKWOOD: May 30, 1932, T. H. Frison, 1 ♀. OREGON: June 21, 1917, 1 ♀; June 30, 1935, DeLong & Ross, 3 ♂, 1 ♀. URBANA: June 18, 1889, 1 ♀; May 1, 1890, C. A. Hart, 1 ♀; June 2, 1890, C. A. Hart, 1 ♀; July 27, 1891, Marten, 1 ♂; July 29, 1891, Terrill, 1 ♂.

## 74. *OPHIOLA* Edwards

*Ophiola* Edwards (1922, p. 206).

Vertex produced before anterior margins of eyes, acutely conical, disc not strongly convex between eyes, sloping regularly from pronotum to apex. Form small, narrow, and elongate.

The 20 or more species of this genus are usually found in bogs or heaths, occurring on *Vaccinium*, *Arctostaphylos*, and *Symphoricarpos*; probably a few species occur in marsh habitats. Five species are recorded for Illinois, and at least four others may occur in this state.

### KEY TO SPECIES

1. Elytra short, reaching tip of or only slightly exceeding abdomen; apical cells relatively short . . . . . 2  
Elytra longer, definitely longer than abdomen; apical cells long and narrow . . . . . 5
2. Length 4.0 mm. or more . . . . . 3  
Length not exceeding 3.5 mm. . . . . 4
3. Color shiny black, vertex, fig. 409*A*, broadly rounded, scarcely longer at middle than next to eyes . . . . . 1. *anthracina*  
Dark in color, not shiny black, vertex, fig. 409*D*, with yellowish lines or spots, distinctly longer at middle than next to eyes . . . . . 2. *uhleri*
4. Vertex, fig. 409*F*, sulfur yellow, without definite markings . . . . . 3. *humida*

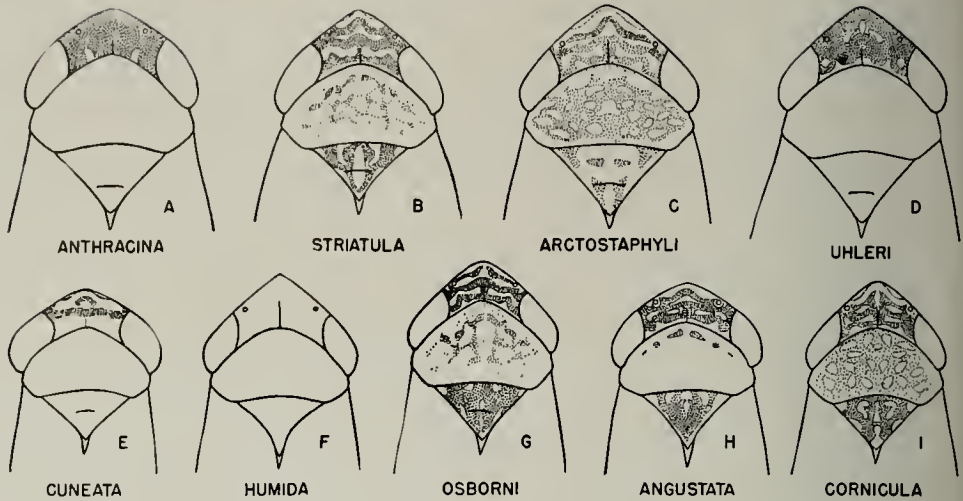


Fig. 409.—*Ophiola*. A-I, heads and pronota.

- Vertex, fig. 409C, tawny, with three transverse fuscous bands..... 4. *arcostaphyli*
5. Vertex, fig. 409E, scarcely longer at middle than next to eyes, marked with one black transverse band; length not exceeding 3.5 mm..... 5. *cuneata*
- Vertex definitely longer at middle than next to eyes, with three transverse bands or indefinite markings; length exceeding 4.0 mm..... 6
6. Slender, elongate; elytra long, greatly exceeding abdomen in length; abdomen reaching about to apex of clavus..... 7
- Broader, more robust, not slender; elytra not greatly exceeding abdomen, latter extending to about cross nervures of apical cells..... 8
7. Vertex, fig. 409I, distinctly and obtusely angled, twice as long at middle as next to eyes and with three distinct dark transverse bands; length 4.5 mm..... 6. *cornicula*
- Vertex, fig. 409H, broadly rounded, one-half longer at middle than next to eyes; markings indefinite, bands not distinct; length not exceeding 4.0 mm..... 7. *angustata*
8. Color olive; fore and middle femora twice banded with white..... 8. *striatula*
- With a definite orange coloration; fore and middle femora shiny black, abruptly orange at apexes, tibia orange..... 9. *osborni*

1. *Ophiola anthracina* (Van Duzee)

*Athysanus anthracinus* Van Duzee (1894a, p. 136).

Length 4 mm. Small, robust, shiny black. Vertex, fig. 409A, obtusely conical, two-thirds as long as width between eyes, with

two spots on posterior margin farther from each other than from the eyes. Female seventh sternite, fig. 410C, with posterior margin slightly and roundedly produced. Male plates, figs. 410A, 410B, triangular, longer than combined basal width, convexly rounded to sharp-pointed apices.

This is a meadow species and is also found on herbaceous plants in wooded or shaded areas in the northeastern states and west to Colorado.

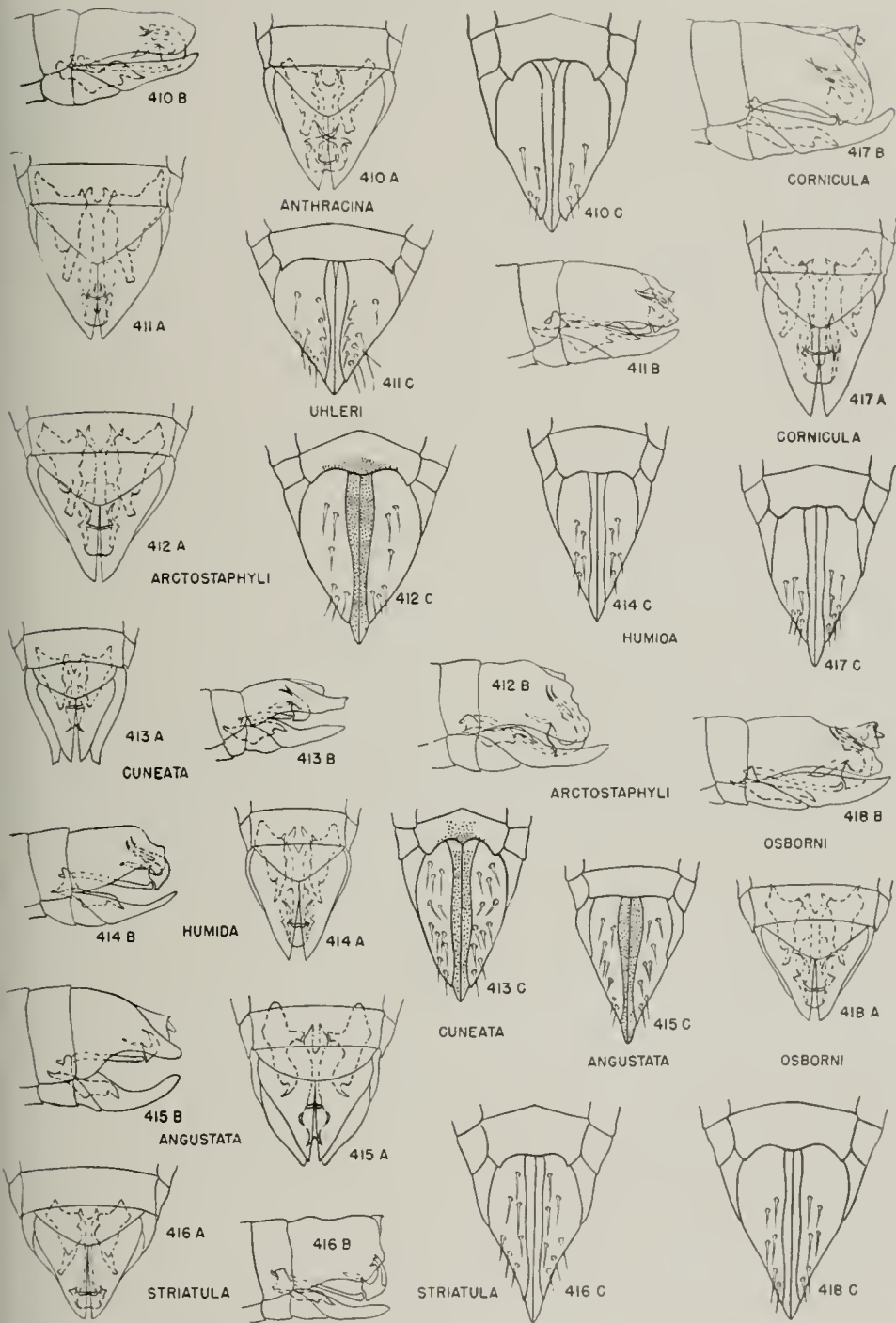
**Illinois Records.**—EICHORN: June 24, 1932, Ross, Dozier, & Park, 1 ♀. HAVANA: sand prairie, Nov. 17, 1913, 4 nymphs. NORMAL: June 22, 1883, 1 ♂, 2 ♀. NORTHERN ILLINOIS: 2 ♂, 3 ♀. RISING: July 16, 1888, C. A. Hart, 1 ♀. ST. JOSEPH: June 27, 1915, 1 ♂. THEBES: July 11, 1935, DeLong & Ross, 1 ♀. URBANA: June 13, 1889, C. A. Hart, 1 ♂; June 30, 1889, 1 ♂. VIENNA: June 14, 1934, DeLong & Ross, 1 ♂, 8 ♀; July 29, 1934, DeLong & Ross, 1 ♀.

2. *Ophiola uhleri* (Ball)

*Athysanus uhleri* Ball (1911, p. 200).

*Athysanus plutonius* Provancher (1889, p. 282). Misidentification of *plutonius* Uhler.

Length 4 mm. Broad, robust, black to brownish. Vertex, fig. 409D, distinctly angled, twice as wide between eyes as median length; a line on posterior margin of vertex, an oblique spot against either eye, and a pair of median apical spots yellowish. Elytra short and broad, truncate posteri-



Figs. 410-418.—*Ophiola*. A, ventral aspect of male genitalia; B, lateral aspect of male genitalia; C, female genitalia.

orly, usually dark, nervures occasionally paler. Female seventh sternite, fig. 411C, with posterior margin roundedly produced, lateral angles bluntly rounded. Male plates, figs. 411A, 411B, triangular, longer than combined basal width, convexly rounded to rather broad pointed apices.

Ranging through the northeastern states and west to Colorado, this species occurs in wet meadow associations.

**Illinois Records.**—ANTIOCH: July 5-7, 1932, T. H. Frison, 1 ♂. KANKAKEE: July 20, 1934, DeLong & Ross, 1 ♀. VOLO: July 27, 1934, DeLong & Ross, 1 ♀.

### 3. *Ophiola humida* (Osborn)

*Athysanus humidus* Osborn (1915, p. 131).

Length 3.5 mm. Resembling *arctostaphyli* but with a yellowish unmarked head. Vertex, fig. 409F, obtusely angled, a little more than twice as long at middle as next to eyes. Pronotum and scutellum yellow, with faint fuscous markings. Elytra pale brown, subhyaline, nervures pale, bordered with fuscous. Female seventh sternite, fig. 414C, with rounded lateral angles, between which the posterior margin is almost truncate. Male plates, figs. 414A, 414B, triangular, longer than combined basal width, gradually narrowed to pointed apices.

This species has been taken only in bog habitats in Maine and Wisconsin. It should occur in bogs in the northeastern part of Illinois.

### 4. *Ophiola arctostaphyli* (Ball)

*Athysanus arctostaphyli* Ball (1899a, p. 172).

Length 3.5 mm. Tawny yellow, with transverse fuscous markings on the head. Vertex, fig. 409C, bluntly angled, a little more than one-half as long at middle as width between eyes; anterior transverse mark produced forward in a loop toward apex, second almost straight, and the basal one is confluent with the second by a common area on median line. Scutellum with fuscous spots in basal angles and a pair of bilobed spots on disc. Elytra testaceous subhyaline, nervures pale, heavily bordered with fuscous.

Female seventh sternite, fig. 412C, with lateral angles produced, between which the posterior margin is slightly produced on either side of the produced median third. Male plates, figs. 412A, 412B, triangular,

gradually narrowed to rather sharp-pointed apices.

This is primarily a heath species reported from the northeastern states. Also it has been collected from the bearberry, *Arctostaphylos*, in Colorado. This plant is found growing along the shores of Lake Michigan in Illinois, and *arctostaphyli* may at some time be found there.

### 5. *Ophiola cuneata* (Sanders & DeLong)

*Euscelis cuneata* Sanders & DeLong (1920, p. 17).

Length 3.0-3.5 mm. Small, wedge-shaped, greenish yellow. Vertex, fig. 409E, almost parallel margined, slightly and roundedly produced, with black transverse band between eyes just back of ocelli. Elytra distinctly longer than abdomen, smoky subhyaline, nervures yellowish. Female seventh sternite, fig. 413C, with prominent lateral angles, posterior margin strongly produced on either side of a dark median obtuse tooth. Male plates, figs. 413A, 413B, long, tapering gradually to acute tips.

This species is common in the eastern states in moist habitats at lagoon margins in the *Juncus-Cyperus* association. In general appearance, it resembles some species of *Limotettix*, especially *striolus*, with which it is often collected.

### 6. *Ophiola cornicula* (Marshall)

*Jassus corniculatus* Marshall (1866, p. 198).  
*Jassus orichalceus* Thomson (1869, pp. 56, 72).  
*Jassus plutonius* Uhler (1877, p. 470).  
*Athysanus instabilis* Van Duzee (1893, p. 284).  
*Athysanus elongatus* Osborn (1915, p. 129).

Length 4.5 mm. Narrow, yellowish, with long elytra. Vertex, fig. 409I, distinctly angled, more than one-half as long at middle as width between the eyes, with three dark transverse lines as in *arctostaphyli*, lines heavier than in that species, the basal one extending forward near each eye and touching the median band. Elytra greatly exceeding abdomen, testaceous, subhyaline, nervures pale, heavily margined with fuscous.

Female seventh sternite, fig. 417C, with posterior margin slightly and roundedly produced. Male plates, figs. 417A, 417B, triangular, gradually narrowed to pointed apices.

This species has been taken in the *Juncus-Cyperus* fresh-water marsh habitat, espe-



cially in the northeastern states, but no other detailed habitat records are available.

**Illinois Record.**—CHEMUNG: Aug. 13, 1937, 1 ♀.

### 7. *Ophiola angustata* (Osborn)

*Athyanus angustatus* Osborn (1915, p. 130).

Length 4 mm. Greenish yellow to brownish, resembling *cornicula*. Vertex, fig. 409H, broadly rounded, more than twice as wide between eyes as length at middle, with irregular markings. Elytra with nervures pale, bordered with fuscous.

Female seventh sternite, fig. 415C, almost truncate on posterior margin, lateral angles very blunt, not produced. Male plates, figs. 415A, 415B, triangular, slightly concave on apical halves, apexes acutely pointed.

This species is northern in distribution.

### 8. *Ophiola striatula* (Fallen)

*Cicada striatula* Fallen (1826, p. 45).

*Athyanus vaccinii* Van Duzee (1890a, p. 135).

Length 4.0–4.5 mm. Olivaceous yellow. Vertex, fig. 409B, obtusely angled, twice as wide between eyes as median length, with three transverse black bands. Elytra longer than abdomen, testaceous, subhyaline, nervures white, tinted with olive, heavily margined with fuscous. Female seventh sternite, fig. 416C, with lateral angles produced, bluntly acute, between which the posterior margin is broadly and concavely rounded and slightly produced at middle. Male plates, figs. 416A, 416B, triangular, as long as combined basal width, apexes bluntly pointed.

This species occurs in Europe and North America; in the United States it ranges from Maine to Colorado. It has been taken from *Vaccinium* in bogs. It is quite variable in coloration, size, and markings.

**Illinois Records.**—LONG LAKE: Aug. 11, 1906, 4 ♂, 11 ♀. NORMAL: June 27, 1883, 1 ♂, 1 ♀. Volo: July 8, 1932, Ross, Dozier, & Mohr, 1 ♂, 1 ♀; July 27, 1934, DeLong & Ross, 17 ♂, 8 ♀; in bog, Aug. 24, 1935, 1 ♂, 10 ♀.

### 9. *Ophiola osborni* Ball

*Ophiola osborni* Ball (1928, p. 190).

Length 4.0–4.5 mm. In general appearance similar to *symphoricarpeae* Ball but

slightly smaller and darker in color. Pale brownish. Vertex, fig. 409G, twice as wide as median length, tinted with red and with three transverse dark bands. Elytra testaceous subhyaline, nervures pale, heavily bordered with fuscous. Front dark, with faint orange arcs. Femora usually dark to near apexes, then orange, as are the tibiae. Female seventh sternite, fig. 418C, with lateral angles bluntly rounded, between which the posterior margin is broadly and concavely rounded, with the median third slightly produced. Male genitalia as in figs. 418A, 418B.

Distributed from Maine and Maryland west to Colorado and Montana, this is an upland species occurring in dry habitats.

**Illinois Records.**—FAIRFIELD: June 12, 1934, DeLong & Ross, 1 ♀. ST. ANNE: Aug. 21, 1934, DeLong & Ross, 1 ♀.

## 75. *Opsius* Fieber

*Opsius* Fieber (1866, p. 505).

Vertex short, broadly rounded, and somewhat produced, almost parallel margined, rounded to front, without a definite margin. Elytra long, without extra costal veinlets.

Only one species of the genus is known to occur in the United States, and it is abundant throughout Illinois.

### 1. *Opsius stactogalus* Fieber

*Opsius stactogalus* Fieber (1866, p. 505).

*Eutettix osborni* Ball (1907, p. 39).

Length 4.0–4.5 mm. Pale green, flecked with white on elytra. Vertex rounded. Pronotum darker green than elytra, irregularly mottled on disc, paler anteriorly. Elytra dark green to apex of each clavus, apical portions smoky, subhyaline; an irregular white band between the green and smoky portions, a round white spot in the apex of the central anteapical cell, and several irregular white flecks on the green portion. Female seventh sternite with posterior margin rounded and slightly produced at middle. Male plates triangular, gradually narrowed to acutely pointed apexes. Aedeagus as in fig. 288B.

This transcontinental species is widespread and abundant. It is commonly found on the ornamental tamarisk, which is apparently its only known food plant.

**Illinois Records.**—HARRISBURG: at light, June 15, 1934, DeLong & Ross, 1 ♂, 3 ♀.

HAVANA: July 2, 1934, DeLong & Ross, 1 ♀. KANKAKEE: at light, July 22, 1935, DeLong & Ross, 2 ♂, 5 ♀. ONARGA: Aug. 29, 1934, DeLong & Ross, 1 ♂. URBANA: June 19, 1934, H. H. Ross, 5 ♂, 11 ♀.

## 76. *LIMOTETTIX* Sahlberg

*Limotettix* Sahlberg (1871, p. 224).  
*Drylix* Edwards (1922, p. 207).

This genus is characterized by a short vertex, not extremely broad, which is slightly produced, almost parallel margined, rounded to front. Ocelli distinctly below the level of vertex. Venation of elytra simple, apical cells elongate.

The species belonging to this genus are all found on the grasses and sedges in the fresh-water marsh and are very similar in appearance. Nine species are recorded for the United States. At least three of these are known to occur in Illinois, and several others may occur here.

### KEY TO SPECIES

1. Vertex slightly produced; male plates triangular or elongate, not excavated on inner margins near apex, as in fig. 419G; female seventh sternite broadly and concavely excavated, as in fig. 419B... 2  
Vertex not produced, almost parallel margined; each male plate excavated on inner margin near apex, or short, truncate, or broadly rounded at apex, as in fig. 419M; female seventh sternite with only median third notched or excavated, as in fig. 419C..... 3
2. Male plates, fig. 419G, elongate, more than one-half longer than combined basal width; female seventh sternite, fig. 419B, rather broadly, angularly excavated half the distance to base.....  
..... 1. *utahnus*  
Male plates, figs. 419F, 419J, shorter, triangular, not longer than combined basal width; female seventh sternite, fig. 419D, broadly, shallowly excavated not more than one-third the distance to base..... 2. *striolus*
3. Male plates, figs. 419L, 419M, concave on inner margins before each apex, apexes convergent, caliper-like; female seventh sternite, fig. 419C, shallowly, angularly notched on median third.....  
..... 3. *divaricatus*  
Male plates short, truncate, or broadly rounded at apexes; female seventh sternite concavely rounded on median third..... 4
4. Male plates, figs. 419E, 419I, very short, with apexes broadly truncate; female seventh sternite slightly concave on posterior margin on either side of median excavation..... 4. *truncatus*

Male plates, figs. 419H, 419K, longer, apexes broadly rounded; posterior margin of female seventh sternite, fig. 419A, strongly, convexly rounded on either side of median excavation.....  
..... 5. *parallelus*

## I. *Limotettix utahnus* (Lawson)

*Drylix utahnus* Lawson (1931b, p. 590).

Length 5.0–5.5 mm. Resembling *striolus*; vertex but slightly produced at middle, a little more than twice as wide as long, yellow, with the usual black transverse bands. Pronotum dirty yellow, with signs of brownish mottling on anterior third. Elytra smoky yellow, nervures paler, cells smoky to brown. Face yellow, with arcs of the front and sutures black. Female seventh sternite, fig. 419B, with the posterior margin broadly, concavely rounded about half way to base. Male plates, fig. 419G, triangular and very long, their bluntly pointed apexes greatly exceeding pygofers.

This is a fresh-water marsh species, reported previously from the Rocky Mountain region, that has been taken in the western part of Illinois.

Illinois Record.—MORRIS: June 18, 1938, Williams, 1 ♂, 1 ♀.

## 2. *Limotettix striolus* (Fallen)

*Cicada striola* Fallen (1806, p. 31).

Length 4–5 mm. Greenish yellow, wedge shaped. Vertex slightly produced, not quite twice as wide as median length, with a transverse black band just back of ocelli. Elytra pale greenish hyaline, nervures pale. Female seventh sternite, fig. 419D, with lateral margins obliquely sloping, posterior margin broadly and concavely excavated. Male plates, figs. 419F, 419J, about as long as combined basal width, convexly rounded to bluntly angled apexes.

This is a common fresh-water marsh and swamp species that ranges from the northeastern states to Colorado and occurs in the *Juncus-Cyperus-Phragmites* association.

Illinois Records.—Many males and females, taken May 2 to October 5, are from Algonquin, Antioch, Aurora, Beach, Cave in Rock, Cedar Lake, Champaign, Dixon, Elgin, Evergreen Park, Fox Lake, Freeport, Fulton, Galena, Havana, Herod, McHenry, Oak Lawn, Orangeville, Palos Park, Putnam, Sheffield, Thomson, Urbana, Vienna, Volo, Waukegan, and Zion.

3. *Limotettix divaricatus* (Sanders & DeLong)

*Euschelis divaricatus* Sanders & DeLong (1923, p. 151).

Length 5.5 mm. Greenish yellow, resembling *parallelus*. Vertex almost parallel, not produced, with black transverse band just

4. *Limotettix truncatus* Slesman

*Drylix truncatus* Slesman (1930, p. 100).

Length 5.0-5.5 mm. Greenish yellow, resembling *parallelus*. Vertex broad, almost parallel margined, not produced, with the usual broad black band just back of ocelli. Anterior margin of pronotum narrowly

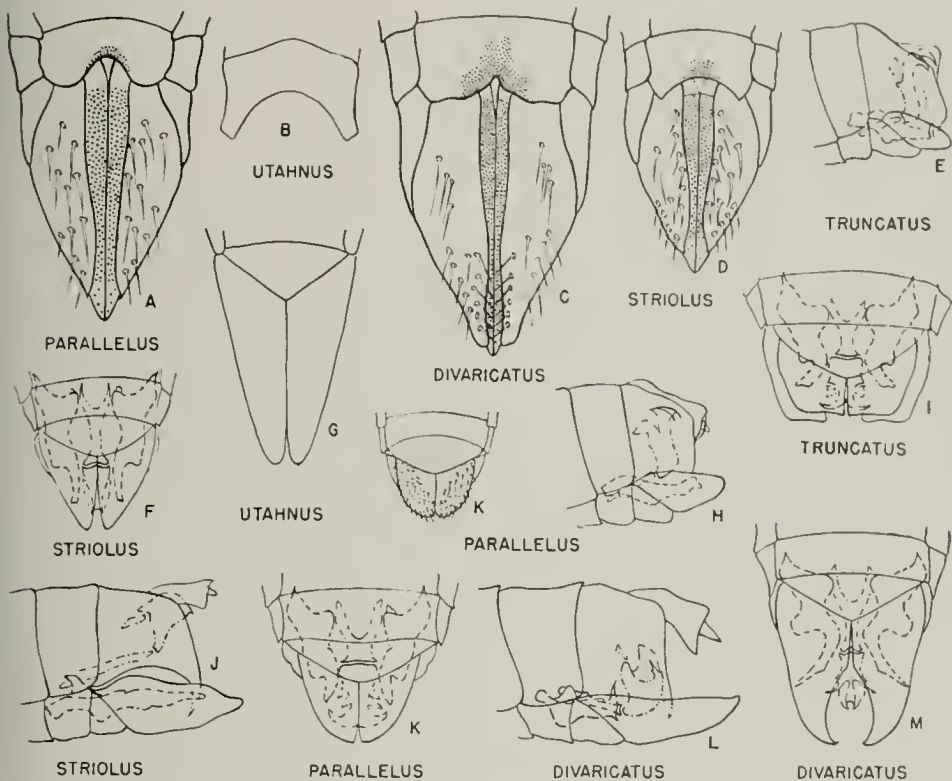


Fig. 419.—*Limotettix*. A-D, female genitalia; E-M, male genitalia, ventral and lateral views.

back of ocelli, and a small spot at apex. Elytra smoky. Female seventh sternite, fig. 419C, with posterior margin almost truncate, slightly and angularly excavated on median third. Male plates, figs. 419L, 419M, about one-half longer than combined basal width, the outer margins convexly rounded, inner margins concavely rounded on apical half to form widely divergent acutely pointed tips; these appear caliper-like when viewed ventrally.

This is a rather scarce fresh-water marsh species that apparently occurs in widely separated areas. It is recorded from Pennsylvania and Idaho, and may eventually be taken in Illinois.

black, a broad transverse black band on disc of posterior half. Disc of scutellum black, a black spot in each basal angle. Elytra dark, nervures pale. Female seventh sternite with median third of posterior margin shallowly concave between the lateral margins and the sharp point where the median excavation meets the posterior margin. Male genitalia as in figs. 419E, 419I.

A fresh-water marsh species taken in small numbers, *truncatus* is known only from the central states. Apparently it is not so abundant as *striolus* and *parallelus*.

Illinois Records.—ODIN: May 28, 1910, 1 nymph; May 30, 1910, 6 ♂, 3 ♀. URBANA: July 2, 1889. C. A. Hart, 20 ♂, 15 ♀; July

15, 1889, Terrill, 2 ♀; Aug. 15, 1890, Miss Snyder, 8 ♂, 4 ♀.

### 5. *Limotettix parallelus* (Van Duzee)

*Athysanus parallelus* Van Duzee (1891, p. 169).

Length 6 mm. Pale yellowish or greenish, resembling *striolus* but larger. Vertex distinctly parallel margined, not produced, with a broad black band just back of ocelli. Elytra subhyaline, nervures with yellowish tint. Female seventh sternite, fig. 419A, with posterior margin truncate, a broad U-shaped notch on median third extending about half way to base. Male plates, figs. 419H, 419K, three-fourths as long as basal width, gradually narrowed to rather broad rounded apexes.

This species is found commonly in association with *striolus* in the fresh-water marsh on the *Juncus-Cyperus-Phragmites* association. Its range is from the north-eastern states to Colorado.

**Illinois Records.**—BEACH: swamps, Aug. 21, 1906, 3 ♂, 5 ♀. MCHENRY: July 27, 1934, DeLong & Ross, 3 ♂, 10 ♀. PRINCETON: July 7, 1934, DeLong & Ross, 6 ♂, 7 ♀; July 2, 1936, B. D. Burks, 2 ♂; June 28, 1937, Ross & Burks, 7 ♂, 5 ♀; July 2, 1937, Mohr & Burks, 1 ♀. ZION: July 16, 1935, DeLong & Ross, 1 ♂, 1 ♀.

### 77. *THAMNOTETTIX* Zetterstedt

*Thamnotettix* Zetterstedt (1838, col. 292).

Fig. 209. Vertex bluntly angled and also bluntly angled with front. Elytra with one crossvein between the first and second sectors. Second anteapical cell elongate, constricted at middle.

Although a large number of North American species have been described in or placed in *Thamnotettix*, most of these have been placed more recently in other genera because of the revised definition of the characteristics of this genus. At present, this genus contains only one species.

#### 1. *Thamnotettix simplex* (Herrich-Schaeffer)

*Jassus simplex* Herrich-Schaeffer (1833, fasc. 125, p. 7).

*Deltocephalus chlamydatus* Provancher (1890, p. 339).

Length 5.5 mm. Dull olive green or brownish green, quite variable in shade and

intensity of color. Vertex paler, with an indistinct band on anterior portion between ocelli. Pronotum darker on disc and posterior margin. Scutellum with a pair of black spots on disc, basal angles black. Elytra smoky to brown, tinged with green.

Female seventh sternite slightly concave, slightly indented on either side of median third. Male valve triangular, plates a little longer than combined basal width, apexes blunt, rounded to inner margins.

A European species commonly distributed in the northern and northeastern portions of the United States and Canada, *simplex* occurs on shrubby and herbaceous growth. It should occur in northern Illinois.

### 78. *MENOSOMA* Ball

*Menosoma* Ball (1931b, p. 4).

Fig. 219. Vertex broad, obtuse, sloping, usually a little longer on median line than next to eye; in lateral view rounded over to front to form an obtusely conical apex. Venation of elytra simple, second cross nervure of each absent, the two outer apical veinlets reflexed and expanded on the costa.

Only one of the two known species of this genus occurs in Illinois.

#### 1. *Menosoma cincta* (Osborn & Ball)

*Eutettix cincta* Osborn & Ball (1898, p. 97).

Length 5.5–6.0 mm. Greenish yellow, marked with brown. Vertex bluntly conical, almost one-half longer at middle than next to eyes, tinted with saffron. Pronotum irrorate. Scutellum pale, a pair of small spots on disc and a spot on each lateral margin. Elytra tinted with saffron, nervures red; a broad brownish band across posterior half of each clavus and obliquely extending back to costa; cross nervures on clavus broadly black, costal nervures black, and an area in the third apical cell sometimes black. Female seventh sternite with the posterior margin slightly rounded, a little produced at middle. Male plates long, broad at bases, concavely narrowed to slender upturned apexes.

Distributed throughout the eastern states and west to Colorado, this is a common species, especially on herbaceous vegetation in wooded or shaded areas.

**Illinois Records.**—Many males and females, taken June 14 to November 17, are from Aldridge, Alton, Apple River Canyon

State Park, Cave in Rock, Danville, Dixon Springs, Dubois, Elizabethtown, Fern Cliff, Grand Detour, Grand Tower, Heathsville, Herod, Horseshoe Lake, Kankakee, Karnak, Metropolis, Oakwood, Rosiclare, St. Anne, Shawneetown, Temple Hill, Urbana, Vienna, Warren, Waukegan, and White Pines Forest State Park.

### 79. *ORIENTUS* DeLong

*Orientus* DeLong (1938c, p. 217).

Resembling *Paraphlepsius* by having ramose pigmented lines but with head conspicuously narrower than pronotum. Vertex transversely impressed behind apex. Lateral margins of pronotum strongly angulate. Elytron with one crossvein between first and second sectors.

Only one North American species of this genus has been recognized.

#### 1. *Orientus ishidae* (Matsumura)

*Phlepsius ishidae* Matsumura (1902, p. 382).  
*Phlepsius tinctorius* Sanders & DeLong (1919, p. 235).

Length of female 6 mm., male 5 mm. Vertex one-fourth wider than long, almost evenly rounded and parallel margined, with apex narrowly but decidedly inflated before a distinct depression; color ivory white, with small irregular black spot on either side of apex, an irregular semicircular black spot above each ocellus, and a large quadrangular orange spot on either side of median dark line, spot margined with irregular black lines. Pronotum short and broad, truncate posteriorly, with distinct flaring lateral angles, broader than head; color tawny, shading to darker, generally marked with vermicular brown lines. Scutellum nearly all orange, marked with brown, also an ivory spot on posterior margin midway between apex and lateral angle. Elytra milky, with pale tawny areas; tip of each clavus, margin of apex, and spots on costal margin dark brown. Face dark brown, with many pale spots.

Female seventh sternite smoothly truncate. Male valve, fig. 242, broadly and bluntly angled; plates long, triangular, evenly tapering to long curved tips, each laterally lobed before the apex.

Known in the United States only from New Jersey, this species has been taken on *Aralia spinosa*.

### 80. *MESAMIA* Ball

*Mesamia* Ball (1907, pp. 31, 59, 75).

Fig. 295. Vertex with the disc depressed, anterior margin usually elevated and acutely angled with the front, margin often slightly produced. Elytra with second cross nerve present, but sometimes obscure, and the central anteapical cell slightly constricted. Usually with several supernumerary veinlets along the clavus and costa.

Beamer (1942) recognized 15 species as belonging to this genus, nearly all of which are found only in the western United States. One species has been taken in Illinois, and two others may eventually be found here. They seem to be associated with the prairie habitat.

#### KEY TO SPECIES

1. A dark broad saddle on each elytron between the cross nervures. . . . . **1. nigridorsum**  
Each elytron without a dark saddle spot. . . . . 2
2. Vertex depressed, with four spots on anterior margin, these connected by a line posteriorly; a broad dark band below vertex. Length 4.5-5.5 mm. . . . . **2. straminea**  
Vertex flat, with a narrow line above and another below margin. Length 3.7-4.5 mm. . . . . **3. coloradensis**

#### 1. *Mesamia nigridorsum* Ball

*Mesamia nigridorsum* Ball (1907, p. 60).

Length 4-5 mm. Milky white, marked with black. Vertex with margin ivory white, disc brown, a black line between ocelli anterior to which is a quadrate black spot on either side of median line. Face black. Pronotum with disc and anterior margin brown, these areas separated by a white transverse band. Elytra milky white, nervures brown, a dark brown or black saddle across the posterior two-thirds of each clavus, usually a narrow band at base and apex of clavus; costal veinlets black.

Female seventh sternite broadly, angularly excavated with a short median tooth about as long as its basal width, slightly bifid at apex. Male plates, fig. 294, a little longer than their combined basal width, narrowed slightly and concavely to acute apices.

Distributed through the eastern states and west to Utah, this conspicuously marked species occurs abundantly on the prairie on

*Helianthus* and produces black spots by its feeding punctures.

**Illinois Records.**—Many males and females, taken June 9 to October 31, are from Aldridge, Champaign, Des Plaines, Dubois, East St. Louis, Evergreen Park, Havana, Kimbundy, La Rue, Muncie, Niota, Oak Lawn, Palos Park, Princeton, St. Anne, Shawneetown, Starved Rock State Park, Summit, Urbana, Vienna, Waukegan, White Pines Forest State Park, Wolf Lake, and Zion.

### 2. *Mesamia straminea* (Osborn)

*Paramesius straminea* Osborn (1898, p. 241).

Length 4.5–5.5 mm. General color greenish to straw, with dark veins. Anterior and posterior margins of vertex ivory white, with an irregular black line interrupted at the middle, this sometimes reduced to four black spots behind the anterior margin. Pronotum with anterior half pale and posterior portion brownish. Elytra subhyaline, tinted with pale brown, three pairs of milky white spots along suture; nervures brown, costal veinlets fuscous. Face pale, a narrow black band just beneath vertex. Female seventh sternite with a sunken tooth as in *nigridorsum*. Male plates acutely pointed as in that species.

This insect occurs on a species of *Helianthus* and is found on the prairies in the Middle West and California.

### 3. *Mesamia coloradensis* (Gillette & Baker)

*Allygus coloradensis* Gillette & Baker (1895, p. 91).

*Paramesius immaculatus* Ball (1905, p. 211).

Length 3.7–4.5 mm. Resembling pale specimens of *straminea*, but smaller and with a flatter vertex. Vertex not produced but acutely angled with the front; usually marked by a fine black line on margin, interrupted at middle, and often with two black spots at base. Pronotum pale, with variable markings, disc irregularly irrorate, often spots near eyes; often without markings. Elytra short, strongly reticulate veined; greenish white to greenish brown, with dark nervures. Female seventh sternite with posterior margin shallowly and angularly excavated on either side of the median fifth, which is produced into a broad tooth as long as its basal width and notched at apex.

Male plates small, a little longer than basal width, concavely narrowed to acute apices.

This species occurs in Colorado and Utah; records for other areas are doubtful. It might be found in the western portion of Illinois.

## 81. *ALIGIA* Ball

*Aligia* Ball (1907, pp. 31, 53, 75).

Fig. 214. Head short, vertex rounded to front, a faint transverse curved depression between ocelli. Elytra long, usually subhyaline, nervures distinct, two cross-veins between first and second sectors and usually a number of veinlets in costal cell and next to claval suture.

Most of the 33 described species and subspecies of the genus, as recognized by Hopper (1939), occur only in the West or Southwest. One species, *modesta*, occurs in the Ohio River valley and has been taken in Illinois.

### 1. *Aligia modesta* (Osborn & Ball)

*Eutettix modesta* Osborn & Ball (1898, p. 98).

Length 4.5–5.5 mm. Fulvous, with a pair of tawny spots near apex of vertex and a pair of oblique marks inside the basal angles. Pronotum faintly irrorate with tawny. Elytra white, subhyaline, tinted with reddish fulvous, interrupted by two pale bands, an indefinite basal band and a narrow definite one across the second cross nervure. Female seventh sternite almost truncate, with a broad slightly rounded median projection. Male plates long, spoon shaped.

Distributed through the eastern half of the United States, this species is usually found on oak and is easily obtained in cut-over areas where oak shrubs grow abundantly.

**Illinois Records.**—CAVE IN ROCK: Oct. 2, 1934, Frison & Ross, 1♂. DIXON SPRINGS: July 9, 1935, DeLong & Ross, 1♀. DOLSON: July 24, 1936, DeLong & Mohr, 1♂. ELIZABETHTOWN: July 8, 1935, DeLong & Ross, 1♂. LA RUE: July 11, 1935, DeLong & Ross, 1♂, 3♀; Oct. 4, 1934, Frison & Ross, 1♂.

## 82. *NORVELLINA* Ball

*Norvellina* Ball (1931b, p. 2).

Fig. 229. Vertex broader than long, almost parallel margined, broadly rounded

to or slightly angulate with front. Venation simple, with one crossvein between the sectors, without true costal veinlets except the two at the ends of the first apical cell. Elytra covered by a saddle pattern of pigmented reticulate lines and veins.

Lindsay (1940) recorded for this genus 29 species and subspecies, chiefly western in distribution, as occurring in the United States. Four species are known from Illinois.

KEY TO SPECIES

1. Greenish yellow, often tinted with brown, but elytra without definite oblique pigmented bands . . . . . **1. tenella**  
Elytra marked with oblique bands of ramose pigment, often in the form of stripes along dorsal portions . . . . . 2
2. Elytra milky white, a broad brown band across posterior half of each elytron . . . . . **2. seminuda**  
Elytra largely brownish . . . . . 3
3. Each elytron with a broad irregular whitish band in front of middle and slightly interrupted near suture by irregular pigmented lines. . . . . **3. chenopodii**  
Costal region of each elytron in basal half with a large well-defined yellowish triangular area that extends on to the clavus and lateral margin of pronotum . . . . . **4. pulchella**

I. *Norvellina tenella* (Baker)

*Thamnotettix tenellus* Baker (1896b, p. 24).

Fig. 421. Length 3.0–3.5 mm. Varying in color from yellow to dark brown. Color markings indefinite, but dorsum often heavily infuscated. Vertex about one-fourth longer at middle than next to eyes. Easily distinguished from the other members of the genus by the unique genitalia. Female

seventh sternite with posterior margin produced on median half, then narrowly, semi-circularly emarginate more than half way to base. Male plates short, broad, widest at apex, where they are roundedly truncate.

This is a widely distributed and an important economic species. Its occurrence in Illinois is both unusual and interesting.



Fig. 421.—*Norvellina tenella*.

Several years ago it was found on its native food plant, the sea purslane, *Sesuvium portuacastrum*, along the Atlantic Coast on sandy beaches, but as far as is known these beach plants are not found in Illinois. It has been taken in abundance from a planting of horse-radish in Illinois, where it caused a diseased condition similar to curly top of sugar beets.

Illinois Records.—COLLINSVILLE: on horse-radish, Oct. 6, 1936, K. J. Kadow, 58 ♂, 34 ♀; on horse-radish, July 14, 1938, L. H. Shropshire, 1 ♀.

2. *Norvellina seminuda* (Say)

*Jassus seminudus* Say (1831, p. 307).

Length 4.5–5.0 mm. Milky to creamy white, with a broad, brown saddle band on elytra. Vertex a little longer at middle than next to eyes. Scutellum often with irregular brownish markings. Elytra with the broad

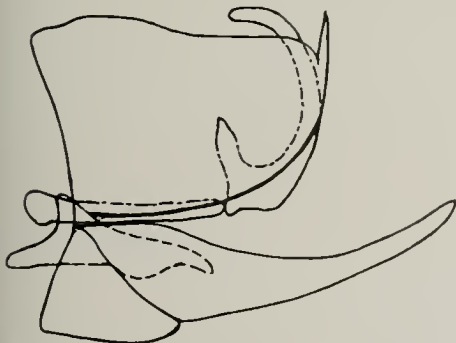


Fig. 420.—*Norvellina chenopodii*, male genitalia.

brown saddle stripe across the posterior half of each clavus and narrowed to half that width on the costa; fourth apical cell often testaceous.

Female seventh sternite with posterior margin truncate or slightly produced, with a wedge-shaped median tooth, which is slightly notched at middle. Male plates long, triangular, apices narrowed, bluntly pointed.

This is one of our common conspicuously marked species, which frequently occurs on cultivated crops, although it apparently does not pass its life cycle upon them. It is found in the eastern states and in the Middle West.

**Illinois Records.**—Many males and females, taken May 7 to October 31, are from Algonquin, Alton, Alto Pass, Anna, Antioch, Beach, Bradley, Carman, Centerville, Champaign, Chicago, Clay City, Clayton, Collinsville, Danville, Decatur, Dixon, Dolson, Eichorn, Ernst, Evergreen Park, Fulton, Grafton, Grand Tower, Hamburg, Hanover, Hardin, Havana, Horseshoe Lake, Kampsville, Kankakee, Lima, Mahomet, Mason City, McHenry, Metropolis, Monmouth, Mount Carmel, Oak Lawn, Oquawka, Palos Park, Pike, Pulaski, Putnam, Quincy, Rosiclare, St. Anne, Savanna, Shawneetown, Urbana, Vienna, Volo, White Heath, White Pines Forest State Park, Wilmington, York, and Zion.

### 3. *Norvellina chenopodii* (Osborn)

*Eutettix chenopodii* Osborn (1923, p. 161).

Length 4.5–5.25 mm. Vertex a little longer at middle than next to eyes. Vertex, pronotum, and scutellum reddish brown, irrorate. Elytra milky white, with median saddle spot, a basal and an apical band on each elytron consisting of minute reddish-brown irrorations. Eyes reddish brown. Female seventh sternite usually slightly emarginate on either side of a broad short median tooth, which is notched at apex. Male plates, fig. 420, broad at bases, concavely rounded to elongate filamentous apices.

Distributed through the eastern states, the Middle West, and west to Utah, this is a common species on *Chenopodium*, on which it produces bright reddish spots by its feeding punctures. It frequently causes economic damage to spinach, swiss chard, and

beets, which belong to the same plant family as *Chenopodium*.

**Illinois Records.**—Males and females, taken May 18 to November 13, are from Algonquin, Alton, Anna, Antioch, Barry, Carbondale, Centralia, Champaign, Clay City, Cornfield, Decatur, Galena, Havana, Hillsboro, Kankakee, Keithsburg, Lawrenceville, Mason City, Monmouth, Monticello, Oak Lawn, Oakwood, Onarga, Oquawka, Palos Park, Pulaski, Putnam, Springfield, Urbana, Vienna, and Wilmington.

### 4. *Norvellina pulchella* (Baker)

*Eutettix pulchellus* Baker (1896b, p. 24).

Length 4.5 mm. Vertex only slightly longer at middle than next to eyes; testaceous brown, with an ivory line in front of the anterior depression into which extend four equidistant brown points. Pronotum with an ivory line on each lateral margin. Scutellum with three white spots, one on apex and one on each lateral margin. Elytron largely brownish except for a large yellowish triangular area, mostly in front of middle, which covers costal area and part of clavus; apical regions of elytra also with whitish areas but these irregular; three pairs of equidistant white spots on each clavus along suture. The female seventh sternite slightly rounded, median fourth slightly emarginate, with two minute teeth at apex extending slightly beyond margin. Male plates long, triangular, apices acute.

This beautifully marked species occurs in northern Illinois on *Eriogonum*.

**Illinois Records.**—GRAND DETOUR: Aug. 22, 1935, DeLong & Ross, 1 ♀. OAK LAWN: at light, summer 1934, DeLong & Ross, 1 ♂.

### 83. *REMADOSUS* Ball

*Remadosus* Ball (1929, p. 3).

Fig. 201. The genus is characterized by a very short and broad vertex, which is parallel margined, transverse, and broadly rounded to front. Ocelli situated in a slight depression distant from the eyes, distinctly below level of disc. Venation simple.

The three species of the genus are made up of large individuals that live in freshwater marshes on species of *Spartina*. Only one species is known to occur in Illinois.



1. *Remadosus magnus* (Osborn & Ball)

*Athysanus magnus* Osborn & Ball (1897, p. 225).

Length 7 mm. Vertex, fig. 201, short, almost parallel margined, four times as broad as long. Vertex, pronotum, and scutellum finely irrorate with fuscous, a transverse ivory band on pronotum. Elytra dark, nervures pale fuscous, with pale margins. Female seventh sternite, fig. 292C, with posterior margin triangularly notched at middle and with a rounded lobe on each side that is a little shorter than the produced lateral angles. Male genitalia as in figs. 292A, 292B.

This is a common inhabitant of the wet prairies of the Middle West and apparently feeds upon species of *Spartina*. It is reported from *Spartina michauxiana* in Iowa and Colorado, and in Florida it has been taken from the salt marsh, where it apparently feeds on *Spartina patens*.

Illinois Records.—AMBOY: Aug. 8, 1934, DeLong & Ross, 3♂. ANTIOCH: Aug. 27, 1932, Ross & Mohr, 1♀. EVERGREEN PARK: Aug. 23, 1934, DeLong & Ross, 2♀; July 1, 1935, DeLong & Ross, 2♂. OAK LAWN: July 27, 1934, DeLong & Ross, 1♀; in lamp globe, Aug. 22, 1934, DeLong & Ross, 3♂; July 1, 1935, DeLong & Ross, 1♂; Sept. 6, 1935, T. H. Frison, 1♀. OGDEN: July 17, 1928, H. H. Ross, 1♀. SUMMIT: July 17, 1935, DeLong & Ross, 2♀.

84. *TROPICANUS* DeLong

*Tropicanus* DeLong (1944a, p. 87).

Fig. 202. Very similar to *Paraphlepsius* but with very short lateral pronotal margins. Eyes appearing almost to touch bases of elytra. Vertex rounded to front. This genus is represented in the United States by a single species.

1. *Tropicanus costomaculatus*

(Van Duzee)

*Allygus costomaculatus* Van Duzee (1894b, p. 207).

*Phlepsius pulchripennis* Baker (1898a, p. 65).

Length 5 mm. Vertex angularly produced, a little longer at middle than next to eyes, slightly less than twice as wide as long; disc faintly marked with brown. Pronotum strongly produced anteriorly, nearly

truncate on posterior margin; faintly marked with brownish spots and small red dots, and with two darker spots behind each eye. Elytra largely hyaline, veins darker, and with three irregular longitudinal brownish areas on each clavus, one on disc of each elytron, and one on each costal vein. Seventh sternite of female produced at middle one-third into a rounded lobe, which is a little longer than the rounded lateral angles.

This species is known only from Texas.

85. *PARAPHLEPSIUS* Baker

*Paraphlepsius* Baker (1897, p. 158).

Figs. 422, 423, 427. Vertex as wide as or wider than pronotum, with margin thin, acutely angled with front, or rounded to front without a definite margin. Disc flat or sloping to front, without a transverse furrow. Elytra exceeding abdomen in length.

This is a large genus, of which 64 species have been recorded for the United States; 21 are known to occur in Illinois, and several others may be found here.

KEY TO SPECIES

1. Females . . . . . 2  
Males . . . . . 27
2. Color patterns of elytra showing transverse banding, with paler and darker shades of brown, dark red or tawny . . . 4  
Color patterns of elytra without transverse banding . . . . . 3
3. Front margin of vertex well produced, foliaceous . . . . . 24  
Front margin of head not strongly produced or foliaceous . . . . . 6
4. Seventh sternite definitely produced at middle, as in figs. 426B, 426X . . . . . 5  
Seventh sternite, fig. 426A, shallowly and concavely excavated, with a short median U-shaped notch . . . 1. *optatus*
5. Seventh sternite, fig. 426B, notched at apex of produced portion, forming two distinct pointed teeth . . . . . 2. *tullahomi*  
Seventh sternite, fig. 426X, convexly rounded on median third, without teeth . . . . . 3. *strobi*
6. Vertex, pronotum, and scutellum yellowish or tawny; elytra heavily marked with brown or black pigment . . . . . 7  
Vertex, pronotum, and scutellum not definitely marked in contrast with elytra . . . . . 10
7. Length 7.5 mm.; seventh sternite, fig. 426I, with a broad shallow notch at center . . . . . 4. *rossi*  
Length not more than 6.0 mm.; median notch in seventh sternite narrow, as in fig. 426D . . . . . 8

- 8. Seventh sternite, fig. 426D, tapered apically, median portion produced with a median incision, forming two pointed appressed teeth..... **5. collitus**  
Seventh sternite not tapered apically, median portion notched, teeth not appressed, as in fig. 426F..... 9

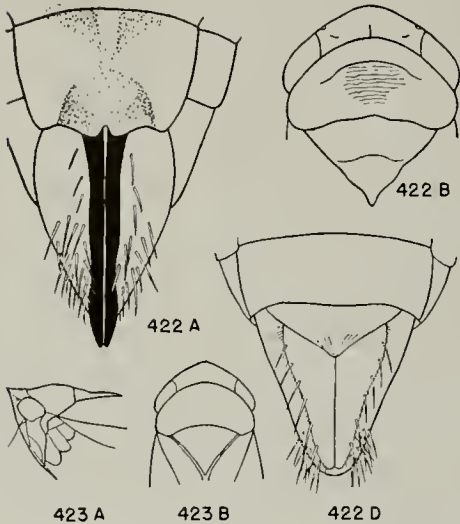


Fig. 422.—*Paraphlepsius umbrosus*. A, female genitalia; B, head and pronotum; D, male external genitalia.  
Fig. 423.—*Paraphlepsius solidaginis*. A, lateral view of head and thorax; B, head and pronotum.

- 9. Length more than 5.5 mm.; elytra dark brown; median teeth of seventh sternite, fig. 426F, separated by V-shaped notch, margin of sternite broadly concave...  
..... **6. fulvidorsum**  
Length not exceeding 5.25 mm.; elytra darker, appearing almost black; median teeth of seventh sternite, fig. 426G, broad, short, and rounded, separated by shallow, U-shaped notch, margin slightly notched between these and lateral angles..... **7. eburneolus**
- 10. Vertex rounded in front, or slightly angulate..... **11**  
Vertex distinctly angulate, definitely longer at middle than next to eyes..... **20**
- 11. Vertex short, margins parallel, or vertex rounded to front, or both..... **12**  
Vertex slightly longer at middle than next to eyes, angled with front..... **15**
- 12. Seventh sternite, fig. 426C, broadly, deeply, angularly excavated on posterior margin practically the full width of sternite..... **8. latifrons**  
Seventh sternite notched only at center, not broadly and deeply excavated.... **13**
- 13. Seventh sternite, fig. 426J, notched at center, producing two proximal short and sharp-pointed teeth.... **9. tigrinus**

- Seventh sternite with a broader notch, without proximal apical teeth, as in figs. 426I, 426U..... **14**
- 14. Median three-fourths of seventh sternite, fig. 426U, produced decidedly beyond the lateral angles, with a broad deep V-shaped notch at center, producing two rounded lobes..... **10. maculosus**  
Median portion of seventh sternite, fig. 426I, not produced beyond lateral angles, notched on either side of two median apically rounded teeth or narrow lobes, which are separated by a broadly angular and shallow median emargination..... **11. turpiculus**
- 15. Pale gray, marked with definite black spots on vertex, scutellum, and pronotum; clavus and costa of each elytron usually with a narrow irregular band across middle..... **1. optatus**  
Darker, brown without definite black spots except where coloration of face is visible on margin of vertex..... **16**
- 16. Length not exceeding 5 mm.; ovate in form, short and broad..... **17**  
Length 6 mm. or more..... **18**
- 17. Seventh sternite, fig. 426L, deeply and concavely emarginate, with median incision forming two rounded black-bordered sunken lobes..... **12. altus**  
Seventh sternite, fig. 426H, broadly, very shallowly concave; margin of excavation truncate, with a median V-shaped notch..... **13. pusillus**
- 18. Seventh sternite, fig. 426N, with lateral margins roundedly narrowed to median half, which is deeply, broadly and angularly notched..... **14. incisus**  
Seventh sternite with distinct lateral angles, posterior margin shallowly concave, as in figs. 426O, 426P..... **19**
- 19. Lateral angles of seventh sternite, fig. 426O, rounded, rather narrowly, roundedly emarginate between these and a pair of rounded teeth formed by a median incision..... **15. umbrosus**  
Lateral angles of seventh sternite, fig. 426P, sharply angled, very shallowly emarginate on either side to a minute median V-shaped notch; margin without produced teeth or lobes..... **16. lascivius**
- 20. Seventh sternite, fig. 426W, with lateral margins rounded to posterior margin, which is truncate and very faintly and concavely emarginate on median third..... **17. truncatus**  
Seventh sternite with prominent produced lateral angles, posterior margin notched or excavated..... **21**
- 21. Seventh sternite, fig. 426T, with median third squarely excavated half way to base and bearing a basal tooth as wide as excavation and extending half way to posterior margin..... **18. irroratus**  
Seventh sternite broadly excavated from lateral angles, with a median notch or incision..... **22**
- 22. Excavation of seventh sternite, fig. 426K, composed of shallow emarginations on either side of a pair of median rounded teeth..... **19. tennesa**

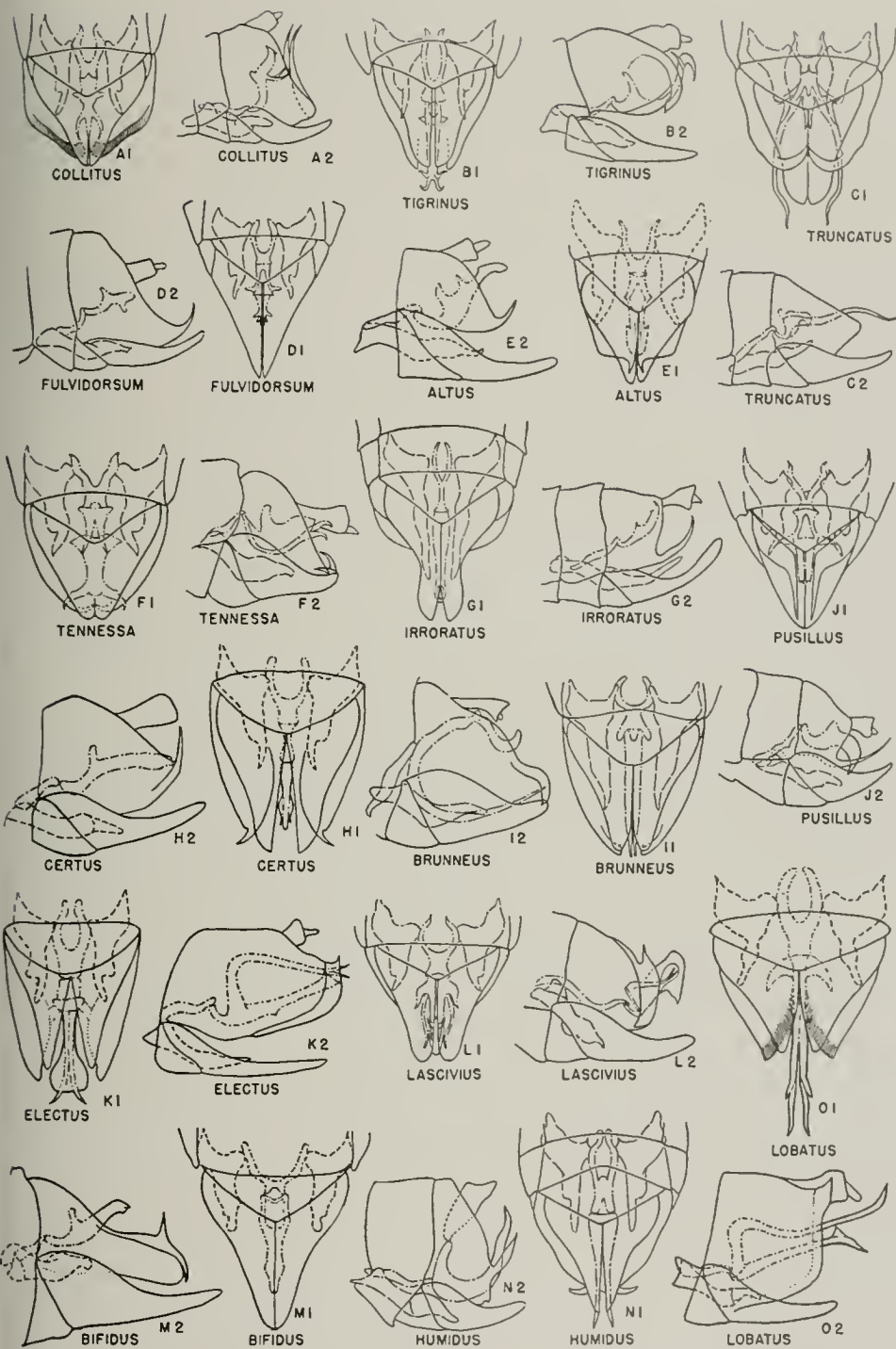


Fig. 424.—*Paraphlepsius*. A-O, male genitalia. 1, ventral aspect; 2, lateral aspect.

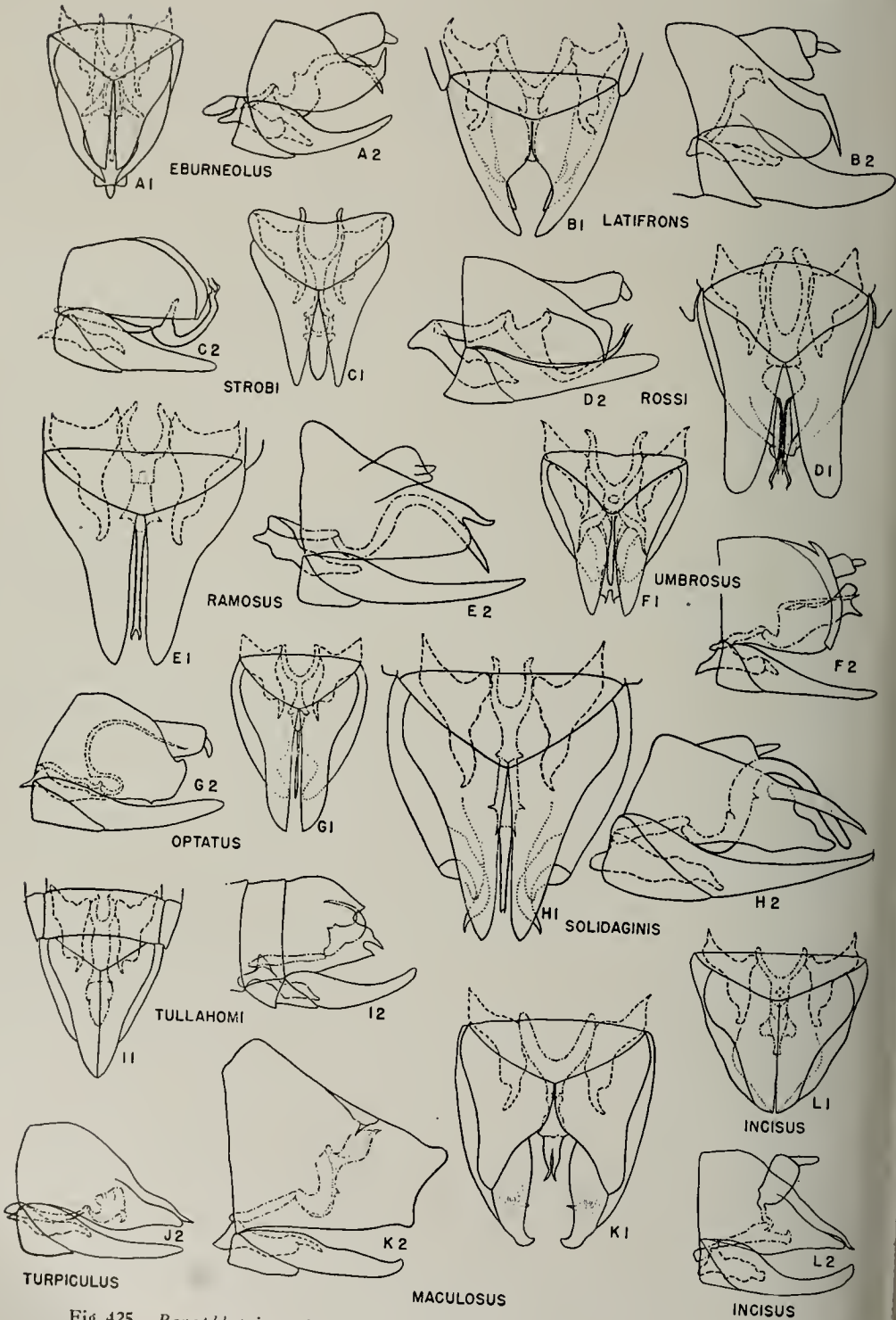


Fig. 425.—*Paraphlepsius*. A-L, male genitalia. 1, ventral aspect; 2, lateral aspect.

Excavation deeper, squarely excavated from narrow pointed lateral angles... 23

23. Rounded median teeth, fig. 426K, separated by a narrow V-shaped median notch one-third the distance to base...

**20. brunneus**

Rounded median teeth, fig. 426E, appressed, divided one-fifth the distance to base... 21. lobatus

Color pattern of elytra without transverse banding... 28

28. Front margin of head well produced, foliaceous... 51

Front margin of head not strongly produced or foliaceous... 31

29. Each pygofer, fig. 425J, notched on either side of a median spine on caudal margin... 2. tullahomi



Fig. 426.—*Paraphlepsius*. A-Y, female seventh sternite.

24. Seventh sternite, fig. 426Q, with a bifid tooth at middle, which is produced decidedly beyond lateral angles

**22. humidus**

Seventh sternite truncate, notched or excavated, not produced at center... 25

25. Seventh sternite broadly excavated or notched from lateral angles... 26

Seventh sternite, fig. 426M, truncate posteriorly, incised next to lateral angles, notched at middle... 23. ramosus

26. Seventh sternite, fig. 426Y, broadly, angularly notched two-thirds the distance to base from pointed lateral angles... 24. bifidus

Seventh sternite, fig. 426S, broadly, shallowly excavated less than one-fifth the distance to base; anterior margin of excavation truncate, slightly notched at middle... 25. solidaginis

27. Color pattern of elytra showing transverse banding, with paler and darker shades of brown, dark red, or tawny... 29

Each pygofer rounded, not notched on caudal margin... 30

30. Aedeagus, fig. 425G, long, very slender, curved dorsally, then caudally to caudal margin of each pygofer... 1. optatus

Aedeagus, fig. 425C, shorter, broad at base, narrowed to a pair of finger-like tips... 3. strobi

31. Vertex, pronotum, and scutellum yellowish or tawny; elytra heavily marked with brown or black pigment... 32

Vertex, pronotum, and scutellum not definitely marked in color, in contrast to elytra... 35

32. Pygofers, fig. 425D, with dorsocaudal spines directed ventrally... 4. rossi

Pygofers with ventrocaudal spines or without spines... 33

33. Aedeagus short, with short dorsal and ventral processes... 34

Aedeagus, fig. 425J, long, slender, convexly curved upward, without dorsal or ventral processes... 7. eburneolus

34. Each pygofer, fig. 424D, oblique caudally, terminating in a ventral, upturned, spinelike apex; aedeagus with very short ventral and dorsal processes . . . . .
- 6. fulvidorsum**
- Each pygofer, fig. 424I, more truncate caudally, with a long heavy dorsally directed spine on ventrocaudal margin; aedeagus with a pair of rather long spines on ventral side. . . . . **5. collitus**
35. Vertex rounded in front or slightly angulate. . . . . 36  
Head distinctly angulate, vertex longer at middle than next to eyes. . . . . 46
36. Vertex short, margins parallel, or vertex rounded to front, or both. . . . . 37  
Vertex slightly longer at middle than next to eyes, vertex angled with front. . . . . 40
37. Plates, fig. 425K, obliquely sloping on inner margins from bases so that they appear divergent. . . . . **10. maculosus**  
Plates not obliquely sloping from bases on inner margins. . . . . 38
38. Vertex broadly rounded to front. . . . . 39  
Vertex bluntly angled with front, margin usually thick; genitalia as in fig. 425J. . . . . **11. turpiculus**
39. Length not over 6 mm.; plates, fig. 424B, not concave on inner margins, inner margins straight, apexes bluntly pointed . . . . . **9. tigrinus**  
Length 7 mm. or more; plates, fig. 425B, concavely excavated on inner margins on apical halves, apexes converging. . . . . **8. latifrons**
40. Aedeagus, fig. 425G, long, very slender, filamentous, curved dorsally and extending to caudal margins of pygofers, without processes. . . . . **1. optatus**  
Aedeagus usually short and broad, or, if elongated, then broader and with dorsal or lateral processes. . . . . 41
41. Length not over 5.5 mm. . . . . 42  
Length 6.0 mm. or more. . . . . 44
42. Aedeagus, fig. 424H, long, rather narrow, about the same width throughout, with a short erect dorsal process about one-third the distance from base. . . . . **26. certus**  
Aedeagus not elongate, shorter and broader, wider at middle than at either end. . . . . 43
43. Each pygofer, fig. 424E, obliquely sloping to pointed apex, basal spine shorter; aedeagus with two dorsal toothlike processes and a blunt apex. . . . . **12. altus**  
Each pygofer, fig. 424J, truncate caudally, basal spine long; aedeagus with one dorsal blunt tooth, apex curved ventrally, tapered, and pointed. . . . . **13. pusillus**
44. Dorsal margin of each pygofer, fig. 425L, obliquely sloping to bluntly pointed apex at ventral margin; a long dorsal spine resting on dorsal margin and extending caudally beyond apex. . . . . **14. incisus**  
Dorsal margin of each pygofer not obliquely sloping to ventral margin, broadly rounded caudally, without long spine extending caudally. . . . . 45
45. Aedeagus, fig. 424L, abruptly and completely recurved ventrally and widened at apex; small dorsobasal processes extending into cavities formed by the recurved apex. . . . . **16. lascivius**  
Aedeagus, fig. 425F, not recurved but straight, twice as long as broad, slightly narrowed before apex. . . . . **15. umbrosus**
46. Pygofers with spines arising from the ventrocaudal angles, as in fig. 424G. . . . . 47  
Pygofer spines wanting or not arising on ventrocaudal margins. . . . . 48
47. Aedeagus, fig. 424G, simple in form, dorsal margin serrate; each pygofer appearing truncate caudally to basal spine. . . . . **18. irroratus**  
Aedeagus, fig. 424F, broadly bifurcate at apex; each pygofer obliquely sloping from dorsal margin to ventrocaudal spines. . . . . **19. tennesa**
48. Each pygofer, fig. 424I, tapered to bluntly pointed apex, with a dorsal spine directed ventrally over apex. . . . . **20. brunneus**  
Each pygofer without dorsal apical spine directed ventrally. . . . . 49
49. Aedeagus, fig. 424C, composed of a short basal dorsally enlarged portion, from which a pair of long slender divergent tapering processes extend beyond margins of pygofers. . . . . **17. truncatus**  
Ventral and dorsal processes of aedeagus elongate, as in fig. 424K. . . . . 50
50. Pygofers, fig. 424O, short, greatly exceeded by aedeagus processes; dorsal process of aedeagus considerably longer than ventral process. . . . . **21. lobatus**  
Pygofers, fig. 424K, longer; aedeagus processes of approximately equal length and scarcely exceeding caudal margins of pygofers. . . . . **27. electus**
51. Each pygofer, fig. 424N, shorter than basal width, with a ventrocaudal spine directed dorsally; aedeagus strongly, concavely curved upward. . . . . **22. humidus**  
Each pygofer longer than basal width, spine dorsocaudal in position; aedeagus not curved concavely upward. . . . . 52
52. Aedeagus long, strongly curved in the form of an inverted sickle, as in fig. 425H. . . . . 53  
Aedeagus, fig. 424M, short, five times as long as broad, almost straight, with a short dorsal process near middle. . . . . **24. bifidus**
53. Caudal margin of each pygofer, fig. 425E, notched, forming a short dorsocaudal spine. . . . . **23. ramosus**  
Dorsal spine, fig. 425H, long, arising about one-third the distance from apex; dorsocaudal margin of each pygofer tapered to a bluntly pointed apex. . . . . **25. solidaginis**

### 1. *Paraphlepsius optatus* (Crumb)

*Phlepsius optatus* Crumb (1915, p. 194).

Length 5-6 mm. A species resembling *collitus* in general form and appearance but lighter in color. Vertex bluntly angled, a

little longer at middle than next to eyes and with margin thick and obtusely angled with front. Pale yellowish, with line on disc of vertex, two spots at base, a spot behind either eye on pronotum, two spots at apex, and two points on disc of scutellum black. Elytra white, sparsely inscribed; a black spot at middle and apex of each clavus, and black spots on costa; a faint irregular band across middle of clavus.

Female seventh sternite, fig. 426*A*, long, tapered, posterior margin very shallowly excavated; a short median U-shaped incision and a black marginal spot on either side. Male plates, fig. 425*G*, long, concavely narrowed at about half their length, then rather evenly produced to near apexes, where they are convexly rounded to pointed apexes on inner margins.

This species has erroneously been placed as a synonym of *cinereus* Van Duzee, but differs in external characters, and the aedeagus is entirely different. It is a common species on grasses at the margins of streams and in moist areas along the Illinois River in the willow-cottonwood habitat. It was recorded previously from Tennessee.

**Illinois Records.**—Many males and females, taken May 28 to October 2, are from Algonquin, Alton, Amboy, Barry, Cave in Rock, Danville, Duncans Mills, Fulton, Grafton, Hardin, Havana, Horseshoe Lake, Kampsville, Lima, Mahomet, Meredosia, Metropolis, Monticello, New Milford, Norris City, Oakwood, Olive Branch, Oregon, Pike, Quincy, Rock Island, Rosiclare, Springfield, Vienna, Wilmington, and Wolf Lake.

## 2. *Paraphlepsius tullahomi* (DeLong)

*Phlepsius tullahomi* DeLong (1916, p. 73).

Length 5.5–6.0 mm. Pale, with the posterior halves of elytra appearing banded. Vertex obtusely angled, one-fourth longer at middle than next to eyes, margin with a definite angle, acutely angled with front. Vertex, pronotum, and scutellum sparsely irrorate. Elytra sparsely marked on each anterior half, the posterior half densely marked with ramose pigment, a rather definite line on middle of clavus separating the two areas.

Female seventh sternite, fig. 426*B*, not narrowed apically, posterior margin slightly concave on either side of a median produced bifid tooth. Male plates, fig. 425*I*, long,

exceeding pygosters, concavely narrowed on either side about middle and produced to rather bluntly pointed apexes.

This is apparently a pine species, occurring normally upon seedlings, and should be found in southern Illinois. It has been recorded from Alabama, Tennessee, and Ohio.

## 3. *Paraphlepsius strobi* (Fitch)

*Bythoscopus strobi* Fitch (1851, p. 58).

*Phlepsius uhleri* Van Duzee (1892*a*, p. 67).

*Phlepsius franconiannus* Ball (1903, p. 228).

Length 4.5–5.0 mm. Small, generally brownish, with paler bands on elytra. Vertex bluntly angled, about one-half longer at middle than next to eyes, margin not sharp but rather definite, obtusely angled with front. Vertex fulvous, pronotum and scutellum brown. Elytra each with a white band across base from middle of scutellum to middle of clavus, a narrow band just beyond apex of clavus and a third just before apex of elytron.

Female seventh sternite, fig. 426*V*, with posterior margin slightly and roundedly produced on median third, a black spot on either side of middle, giving the appearance of a median tooth. Male plates, fig. 425*C*, long, gradually, slightly, and concavely narrowed to pointed apexes.

This is one of the common pine species in the eastern United States and should be found in Illinois in the pine association.

## 4. *Paraphlepsius rossi* (DeLong)

*Phlepsius rossi* DeLong (1938*b*, p. 43).

Length 7.5 mm. Rather large, robust, with vertex, pronotum, and scutellum buff or dull yellow. Vertex bluntly angled, one-half longer at middle than next to eyes, margin of vertex angled with front. Vertex rather heavily irrorate with brown on margin at apex and on either side of middle. Pronotum irrorate on disc. Elytra heavily irrorate, appearing brown in contrast with the yellowish vertex, pronotum, and scutellum.

Female seventh sternite, fig. 426*I*, with posterior margin produced and margined with brown on either side of a rather broad shallow V-shaped notch. Male plates, fig. 425*D*, long, gradually tapering to narrow blunt apexes. Aedeagus in ventral view rather broad, apical half directed dorsally.

apex with four terminal slender processes; central pair long and forming the terminal portion of the aedeagus, the lateral pair short. A heavy spine-bearing process arising at the apex of each pygofer and extending across to opposite side.

This species occurs in Illinois and Connecticut in the floodplain woods association where tall grasses and dense herbaceous plants are found with cane in shaded areas. This is the only type of habitat in which it has been collected.

**Illinois Record.**—HEROD: Aug. 4, 1934, Mohr & DeLong, 1 ♂, 5 ♀.

### 5. *Paraphlepsius collitus* (Ball)

*Phlepsius collitus* Ball (1903, p. 227).

Length 5.5–6.0 mm. One of the smaller of the yellow-headed group. Vertex a little longer at middle than next to eyes, produced and bluntly angled, margin definite, vertex angled with front. Vertex, pronotum, and scutellum irrorate with pale or yellowish brown and contrasting with the dark brown irrorations on the elytra.

Female seventh sternite, fig. 426D, posteriorly emarginate on either side of a broad median tooth, which is bifid at apex. The entire margin heavily brownish. Male plates, fig. 424A, rather long, broad at bases, concavely narrowed on apical halves to bluntly pointed apices.

This is a common grass-feeding species in meadows and in open woodland habitats, and it occurs from Maine to Florida and west to Iowa. It is widely distributed in Illinois.

**Illinois Records.**—Males and females, taken May 6 to October 3, are from Anna, Billett, Carbondale, Champaign, Cobden, Dixon Springs, Dolson, Effingham, Eichorn, Fulton, Golconda, Grand Tower, Hamburg, Harrisburg, Havana, Herod, High Knob, Hillsboro, Karnak, Lima, Metropolis, Oakwood, Pike, Princeton, Putnam, Shawneetown, Thebes, Urbana, Ursa, and Vienna.

### 6. *Paraphlepsius fulvidorsum* (Fitch)

*Jassus fulvidorsum* Fitch (1851, p. 62).

Length 5.5–6.0 mm. Vertex, pronotum, and scutellum pale fulvous yellow, contrasting with the dark brown elytra. Vertex angulate, one-half longer at middle than next to eyes; margin sharp, acutely angled with front. Female seventh sternite, fig.

426F, with posterior margin incised at middle, forming a pair of median short blunt teeth; margin slightly emarginate between each tooth and lateral angles on each side. Male plates, fig. 424D, long, gradually narrowed from bases to pointed apices.

Although occurring in the eastern states and west to the Rocky Mountains, this species is not abundant but is taken more commonly in small numbers in habitats that are like the heath. It occurs on grasses in both moist and dry areas.

**Illinois Records.**—Males and females, taken July 8 to October 3, are from Anvil Rock, Apple River Canyon State Park, Channel Lake, Dixon Springs, Dolson, Elizabethtown, Fern Cliff, Grand Detour, Herod, Muncie, and Palos Park.

### 7. *Paraphlepsius eburneolus* (Osborn & Lathrop)

*Phlepsius eburneolus* Osborn & Lathrop (1923, p. 331).

Length 5.0–5.25 mm. Vertex light fulvous; pronotum, scutellum, and elytra dark brown. Vertex obtusely angled, one-third longer at middle than next to eyes, apex with a sharp edge, angled with front. Female seventh sternite, fig. 426G, with posterior margin notched at middle, produced, with a pair of blunt teeth; slightly emarginate on either side between each tooth and broadly rounded lateral angle. Male plates, fig. 425A, slightly concave on center of outer margins, each convexly rounded to inner margin at apex, forming a pointed apex.

Apparently this species is found on grasses in woodland areas only. It is apparently not abundant, although taken from Virginia to Minnesota. In Illinois, it has been taken from a woodland habitat.

**Illinois Record.**—DOLSON: July 24, 1936, DeLong & Mohr, 1 ♀.

### 8. *Paraphlepsius latifrons* (Van Duzee)

*Phlepsius latifrons* Van Duzee (1892a, p. 66).

Length 7 mm. Large, robust, with a short broadly rounded head. Vertex slightly longer at middle than next to eyes. Margin thick, obtusely angled, almost rounded to front. Pronotum almost four times as long as vertex. Color pale, heavily marked with brownish irrorations and ramose pigment lines.

Female seventh sternite, fig. 426C, broadly,



angularly excavated, the sides of excavation sinuate. Male plates, fig. 425B, concavely excavated on inner margins just below narrowed rather pointed and convergent apices.

This is a pasture species, recorded previously from the southeastern states, and has never been found abundantly. It occurs in pastures of long standing where there is a variety of herbaceous vegetation.

**Illinois Records.**—CAVE IN ROCK: Oct. 2, 1934, Frison & Ross, 1 ♀. CLAY CITY: at light, June 24, 1909, 1 ♂. DIXON SPRINGS: July 9, 1935, DeLong & Ross, 1 ♂, 1 ♀. GOLCONDA: June 22, 1934, Ross, Dozier, & Park, 1 ♀. SHAWNEETOWN: June 23, 1936, DeLong & Ross, 3 ♂, 3 ♀; June 27, 1936, DeLong & Mohr, 7 ♂, 1 ♀.

### 9. *Paraphlepsius tigrinus* (Ball)

*Phlepsius tigrinus* Ball (1909a, p. 80).

Length 6 mm. Tawny, brown, with faint reticulations, and with a pale spot on yellow scutellum. Vertex short, only slightly longer at middle than next to eyes, margin thick, not sharply angled with front. Female seventh sternite, fig. 426J, with the posterior margin short, roundedly emarginate on either side of a produced median tooth, which is narrowly bifid at middle. Male plates, fig. 424B, concavely narrowed on outer margins at middle, each produced and convexly rounded at apex to form pointed tips on inner margin.

Previously recorded from the District of Columbia and Ohio, this species has been taken in Illinois. It occurs only on pine.

**Illinois Records.**—GIBSONIA: Oct. 2, 1934, Frison & Ross, 1 ♂. OAKWOOD: Aug. 17, 1934, DeLong & Ross, 1 ♂.

### 10. *Paraphlepsius maculosus* (Osborn)

*Phlepsius maculatus* Osborn (1905a, p. 276).

Name preoccupied.

*Phlepsius maculosus* Osborn in Osborn & Lathrop (1923, p. 319). New name.

Fig. 427. Length 7 mm. Broad headed. Vertex short, scarcely longer at middle than next to eyes; margin thick, almost rounded to front. Pale, marked with brown irrorations that blend into spotted areas on head, pronotum, and elytra. Four dark spots on anterior margin of vertex and two darker spots next to the posterior border. Female seventh sternite, fig. 426U, long, median three-fourths produced abruptly into a lobe,

the median third of which is notched one-fourth the distance to base by a V-shaped notch with the apex rounded; black spot causes segment to appear more deeply notched. Male plates, fig. 425K, short, inner margins concavely excavated, forming divergent bluntly pointed apices. Pygofers greatly exceeding plates.

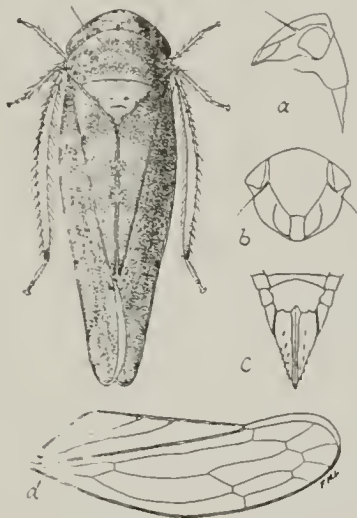


Fig. 427.—*Paraphlepsius maculosus*. Adult: a, profile; b, face; c, female genitalia; d, elytron. (From Osborn.)

This species, described from Ohio, is apparently rare or very difficult to capture. One male was collected in Illinois on a sand prairie that is being invaded by woodland. Records indicate that the species is usually taken in prairie habitats.

**Illinois Record.**—ST. ANNE: July 20, 1934, DeLong & Ross, 1 ♂.

### 11. *Paraphlepsius turpiculus* (Ball)

*Phlepsius turpiculus* Ball (1500b, p. 200).

Length 6–7 mm. Broad headed. Vertex almost parallel margined, but little longer at middle than next to eyes, margin roundedly angulate, bluntly angled with front. Color rather uniformly and evenly irrorate with brownish pigment. Female seventh sternite, fig. 426I, with posterior margin rather deeply and concavely excavated on either side of median half, which is broadly, shallowly, and angularly excavated, with a black mark at apex of excavation suggesting a deep incision. Male plates, fig. 425J, concavely narrowed and tapered to acute apices.

Each pygofer spine directed caudally, sinuate, and lying dorsad to caudal end of pygofer.

For many years we have referred specimens of this species to *fuscipennis*, which is a smaller and darker species and seems to be confined to the Atlantic coastal area; *turpiculus* is a prairie form closely related to *fuscipennis* and occurs in the northern part of Illinois, as well as other parts of the Middle West and the South. It occurs in moist habitats and in prairie lagoons in marshy areas.

**Illinois Records.**—BEACH: July 25, 1934, Frison & DeLong, 2 ♀. NORTHERN ILLINOIS: 1 ♀. OAK LAWN: Sept. 6, 1935, T. H. Frison, 1 ♂. ZION: Aug. 7, 1935, Ross & DeLong, 1 ♀.

## 12. *Paraphlepsius altus* (Osborn & Ball)

*Phlepsius altus* Osborn & Ball (1897, p. 228).

Length 5 mm. Short, robust. Vertex bluntly angulate, about one-fifth longer at middle than next to eyes, margin thick, bluntly angled with front. Rather evenly and densely irrorate with dark fuscous. Female seventh sternite, fig. 426L, with lateral angles strongly produced, between which the posterior margin is broadly, deeply, and abruptly emarginate, the margin of excavation at base forming a rounded black lobe on either side of a median narrow incision. Male plates, fig. 424E, long, slightly and concavely narrowed to acute bluntly pointed apices.

Recorded only from the Middle West, this species is common in the wet prairie and usually does not occur in dry prairie habitats. It has been collected in Illinois from short grasses in low moist prairie habitats.

**Illinois Records.**—FULTON: low pasture, July 8, 1934, DeLong & Ross, 1 ♂, 4 ♀. ZION: Aug. 7, 1935, DeLong & Ross, 1 ♀.

## 13. *Paraphlepsius pusillus* (Baker)

*Phlepsius pusillus* Baker (1892a, p. 66).

*Phlepsius collinus* Osborn & Lathrop (1923, p. 324).

Length 4.5–5.0 mm. Short, broad, robust. Vertex distinctly angulate, almost one-half longer at middle than next to eyes, margin distinct, angled with front. Vertex, pronotum, and scutellum dark, interspersed with white spots. Elytra marked with dark brown

vermiculate lines. Female seventh sternite, fig. 426H, short, posterior margin broadly, very shallowly emarginate, with a short V-shaped notch at middle; entire margin of excavation heavily embrowned. Male plates, fig. 424J, evenly, slightly, and convexly narrowed to bluntly angled apices.

Recorded previously from the Atlantic states, this is a common hillside pasture species in southern Illinois, where it occurs on short grasses. It seems to be rather definitely restricted to a dry upland habitat.

**Illinois Records.**—ANVIL ROCK: Oct. 3, 1934, Frison & Ross, 1 ♂, 3 ♀. CAVE IN ROCK: Oct. 2, 1934, Frison & Ross, 1 ♂. DIXON SPRINGS: July 29, 1934, DeLong & Mohr, 6 ♂, 2 ♀. FERN CLIFF: Aug. 3, 1934, DeLong & Mohr, 1 ♀. HEROD: Aug. 3, 1934, DeLong & Mohr, 1 ♂, 1 ♀. VIENNA: July 29, 1934, DeLong & Ross, 3 ♂, 7 ♀.

## 14. *Paraphlepsius incisus* (Van Duzee)

*Phlepsius incisus* Van Duzee (1892a, p. 73).

Length 6 mm. Rather broad, robust. Vertex bluntly angled, a little longer at middle than next to eyes, distinctly angled with front, margin definite. Marked with brown irrorations, often appearing whiter along the margin. Female seventh sternite, fig. 426N, with lateral margins sloping to median half of segment, which is rather deeply, broadly, and angularly excavated more than one-third the distance to base, and with a brown spot on either side of notch on outer sloping margin; lateral angles absent. Male plates, fig. 425L, deeply, concavely excavated on outer margins and produced to rather broad blunt rounded apices.

This is a grass-feeding species usually found in open woodland areas and often in rather densely shaded herbaceous growth. It is found in the East and Middle West, and occurs in small numbers in widely separated localities in Illinois.

**Illinois Records.**—ANTIOCH: July 5–7, 1932, T. H. Frison, 1 ♂. APPLE RIVER CANYON STATE PARK: Aug. 22, 1935, DeLong & Ross, 3 ♂. DOLSON: July 18, 1934, DeLong & Ross, 1 ♂, 1 ♀; July 24, 1936, DeLong & Mohr, 1 ♀. SAVANNA: July 19, 1892, McElfresh, Shiga, Forbes, & Hart, 1 ♀. URBANA: July 28, 1889, C. A. Hart, 1 ♀; Aug. 18, 1892, C. A. Hart, 1 ♀; Sept. 5, 1898, C. W. Woodworth, 1 ♀; July 18, 1917, 1 ♂; Aug. 17, 1920, 1 ♂.

15. *Paraphlepsius umbrosus* (Sanders & DeLong)

*Phlepsius umbrosus* Sanders & DeLong (1917, p. 88).

Length 6.0–6.5 mm. Large, rather robust, brownish. Vertex obtusely angled, one-half longer at middle than next to eyes, margin thick, obtusely angled with front; rather densely and evenly irrorate with brown, except for a paler spot each side next to eye. Female seventh sternite, fig. 426O, long, tapered, posterior angles prominent, narrowly rounded. Posterior margin produced, bifid at center, a rounded tooth either side; the margin slightly concave between each median tooth and lateral angle. Male plates, fig. 425F, long, rather narrow, slightly and concavely narrowed on outer margins to bluntly pointed apices. Aedeagus with a narrow straight dorsal process. Body of aedeagus not recurved but straight, a little narrowed before apex.

This species has a northern distribution and is an open woodland form living on herbaceous vegetation in rather definitely shaded areas. It has been taken in northern Illinois.

**Illinois Record.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, DeLong & Ross, 1 ♀.

16. *Paraphlepsius lascivius* (Ball)

*Phlepsius lascivius* Ball (1900b, p. 200).  
*Phlepsius micronotatus* Osborn & Lathrop (1923, p. 321).

Length 6 mm. Rather robust, brownish, with the black coloration of the face visible on margin of vertex from above. Vertex bluntly angled, slightly longer at middle than next to eyes, margin thick, obtusely angled with front; densely irrorate with dark brown except for a white spot at apex, on either side of which is a polished black spot formed by the extension of the black coloration on the upper portion of face. Female seventh sternite, fig. 426P, long, posterior margin broadly, very shallowly emarginate, with a slight notch at middle. Male plates, fig. 424L, concavely narrowed on median portion to broadly rounded apices.

This is a western prairie species and may eventually be found in the prairie habitat in Illinois.

17. *Paraphlepsius truncatus* (Van Duzee)

*Phlepsius truncatus* Van Duzee (1892a, p. 72).

Length 5.25–5.5 mm. Narrow, with bluntly angulate head; superficially resembling *irroratus* so closely that the two species cannot be separated except by use of the external genital characters. Vertex about one-fourth longer at middle than next to eyes and bluntly angled with front. Rather uniformly irrorate with brown. Female seventh sternite, fig. 426H', with lateral margins broadly rounded to posterior margin, which is almost truncate, but very slightly emarginate on median third, the emargination black bordered. Male plates, fig. 424G, gradually, slightly, and concavely narrowed to rather broad blunt apices, which are convexly rounded on outer margins to inner margins.

This is a very common and abundant species in the eastern states but is not found in as great numbers as *irroratus*. The optimum habitat seems to be a moist open woodland with dense herbaceous vegetation.

**Illinois Records.**—Many males and females, taken June 13 to October 3, are from Alsip, Alton, Anvil Rock, Barry, Cave in Rock, Dixon Springs, Dolson, Eichorn, Elizabethtown, Fairfield, Fulton, Gibsonia, Grand Tower, Herod, Hillsboro, Homer, Mahomet, Marshall, Metropolis, Momeno, Muncie, Norris City, Oak Lawn, Pana, Princeton, Seymour, Shawneetown, Thebes, Urbana, Vienna, Volo, and Watson.

18. *Paraphlepsius irroratus* (Say)

*Jassus irroratus* Say (1831, p. 308).  
*Jassus testudinarius* Burmeister (1838, pl. 14).

Length 5.5–6.0 mm. Slender, with a bluntly, angularly produced vertex that is about one-fourth longer at middle than next to eyes; margin rather thick, obtusely angled with front. Coloration somewhat variable, usually rather uniformly and heavily irrorate. Female seventh sternite, fig. 426T, truncate, with a short tooth produced on either side of median third, which is squarely and deeply excavated half way to base; a broad tooth the width of excavation extending half way to posterior margin. Male plates, fig. 424G, concavely narrowed near middle, apices produced as long narrow straplike processes that are blunt at apices.

Transcontinental in distribution, this is

the most common species of the genus and occurs in almost every habitat condition. It is common in pasture, meadow, and wet prairie situations, and occurs upon almost every type of cultivated crop.

**Illinois Records.**—Many males and females, taken May 15 to October 31, are from Adair, Algonquin, Alton, Anvil Rock, Apple River Canyon State Park, Arcola, Atlas, Aurora, Beach, Bradley, Buda, Bushnell, Cairo, Carbondale, Carman, Cave in Rock, Champaign, Charleston, Chemung, Chicago, Clayton, Clay City, Collinsville, Cornland, Danville, Decatur, Deland, Des Plaines, Dolson, Dongola, Dubois, Dwight, Eichorn, Elgin, Elizabethtown, Fairfield, Forrest, Fox Lake, Fulton, Galena, Geff, Gibson City, Gibsonia, Golconda, Grafton, Grand Detour, Grays Lake, Harrisburg, Havana, Herod, High Knob, Hillsboro, Kampsville, Kankakee, Karnak, Lima, Luther, Mahomet, Marshall, Meredosia, Metropolis, Momence, Monmouth, Monticello, Mount Carmel, Muncie, New Holland, Norris City, Oak Lawn, Oakwood, Ogden, Olive Branch, Onarga, Palos Park, Pana, Payson, Pécatonica, Pekin, Pike, Princeton, Pulaski, Putnam, Quincy, Rosiclare, Round Lake, St. Anne, Seymour, Shawneetown, Sheffield, Sibley, Sparta, Springfield, Starved Rock State Park, Sterling, Sumner, Thebes, Temple Hill, Urbana, Ursa, Vandalia, Vienna, Virginia, Volo, Waukegan, White Heath, and Zion.

### 19. *Paraphlepsius tennesa* (DeLong)

*Phlepsius tennesa* DeLong (1916, p. 75).  
*Phlepsius similis* Lathrop (1917, p. 128).

Length 5.5–6.0 mm. Rather large and elongate. Vertex bluntly angled, about one-half longer at middle than next to eyes, forming a rather definite margin with the front. Marked with brownish irrorations, but without definite additional markings. Female seventh sternite, fig. 426R, with posterior margin rather broadly and shallowly emarginate on either side of a median narrowly notched portion; median line cephalad to notch and each emargination brown bordered. Male plates, fig. 424F, gradually, slightly, and concavely narrowed to blunt rounded apices.

This is a common grass-feeding species and is found abundantly in moist or partly shaded habitats. It was reported previously from Ohio and eastward.

**Illinois Records.**—Males and females, taken June 14 to October 2, are from Cache, Carmi, Cave in Rock, Dixon Springs, Dongola, Dolson, Elizabethtown, Fern Cliff, Jonesboro, Karnak, Norris City, Olive Branch, Shawneetown, Temple Hill, and Vienna.

### 20. *Paraphlepsius brunneus* (DeLong)

*Phlepsius brunneus* DeLong (1916, p. 74).

Length 6–7 mm. Resembling *tennessa* in form and size, but usually darker brown in color. Vertex obtusely angled, about one-half longer at middle than next to eyes, vertex definitely angled with front, margin rather sharp. Rather heavily and evenly irrorate with dark brown pigment. Female seventh sternite, fig. 426K, roundedly narrowed to produced narrow lateral angles, between which the posterior margin is broadly excavated about one-fourth the distance to base; posterior margin of excavation slightly produced at middle and rather deeply and narrowly notched, the concavity on each side of notch dark margined. Male plates, fig. 424I, rather long, concavely tapered to rather blunt pointed apices.

This species is found less commonly than *tennessa* but in similar moist grassy habitats. It was previously reported from Tennessee and the Lake Erie region.

**Illinois Records.**—Males and females, taken June 13 to August 17, are from Dolson, Eichorn, Havana, Herod, Karnak, Metropolis, Norris City, Quincy, St. Joseph, Shawneetown, and Vienna.

### 21. *Paraphlepsius lobatus* (Osborn)

*Phlepsius lobatus* Osborn (1898, p. 247).

Length 4.5–5.25 mm. Rather elongate, with a bluntly angled vertex, rounded at apex, and a little longer at middle than next to eyes; vertex bluntly angled with front, margin thick. Dorsum rather evenly, but not densely, irrorate with fuscous. Female seventh sternite, fig. 426E, slightly narrowed, lateral angles strongly produced and pointed, between which the posterior margin is abruptly excavated about one-fifth the distance to base, with the margin of excavation slightly and angularly produced and incised at middle. Male plates, fig. 424O, short, concavely narrowed to bluntly pointed apices, which are slightly divergent.

This is an uncommon Middle Western

species that has been collected in moist grassy habitats. It should occur in northern Illinois.

22. *Paraphlepsius humidus* (Van Duzee)

*Phlepsius humidus* Van Duzee (1892a, p. 76).  
*Phlepsius dentatus* Baker (1898a, p. 65).

Length 6-7 mm. Large, broad, yellowish brown. Vertex obtusely angled, anterior margin thin, acutely angled with front; vertex and scutellum usually pale yellowish. Elytra with three indistinct transverse bands; a fuscous spot on suture at middle and apex of each clavus. Female seventh sternite, fig. 426Q, short, lateral angles rounded, between which the posterior margin is concavely notched on either side of the median half, which is produced beyond the lateral angles and is bifid at center, producing a pair of pointed teeth; sides of produced portion black margined. Male plates, fig. 424N, rather rapidly narrowed to acutely angled apices.

This species is abundant in the eastern half of the United States in fresh-water marshes and in moist or wet grassy meadow areas. Apparently it lives on coarse grasses or sedges.

**Illinois Records.**—Males and females, taken May 29 to October 5, are from Algonquin, Buda, Champaign, Channel Lake, Dubois, Grand Detour, Hamilton, Havana, Herod, Homer, Keithsburg, Lake Villa, Macomb, McHenry, Muncie, Oquawka, Princeton, Spring Valley, Sugar Grove, Sun Lake, Urbana, and Volo.

23. *Paraphlepsius ramosus* Baker

*Paraphlepsius ramosus* Baker (1897, p. 158).  
*Phlepsius tenuifrons* Sanders & DeLong (1919, p. 235).

Length 7 mm. Large, robust, with a thin-margined almost foliaceous vertex, which is roundedly angulate; margin sometimes definitely upturned. Dark brown to fuscous, elytra with fuscous marking more dense posterior to middle, producing a banded appearance. Female seventh sternite, fig. 426M, long, appearing almost truncate, posterior margin slightly notched at middle, the margin between notches sinuate. Male plates, fig. 425E, long, concavely narrowed near middle on outer margins, then produced, forming bluntly pointed apices.

This northeastern species occurs on tall

grasses or sedges in fresh-water marshes, and on coarse grasses in low wet meadows. It has not been found on the prairies.

**Illinois Records.**—CHAMPAIGN: at light, July 27, 1887, C. A. Hart, 1 ♂. DOLSON: Rocky Branch, July 18, 1934, DeLong & Ross, 1 ♂, 1 ♀. MUNCIE: sweeping, July 25, 1908, 1 ♀; Aug. 15, 1917, 1 ♀. URBANA: sweeping, June 21, 1889, C. A. Hart, 1 ♂.

24. *Paraphlepsius bifidus* (Sanders & DeLong)

*Phlepsius bifidus* Sanders & DeLong (1917, p. 89).

Length 7 mm. Large, rather robust. Vertex roundedly angulate, about one-third longer at middle than next to eyes, flattened, margin acute, thin, sharpest at middle. Color dark gray, vertex yellowish, pronotum yellowish on anterior margin, disc darker. Scutellum ivory white, with sparse irrorations. Elytra marked with brown pigment, darker on posterior half, and with indication of a paler band at middle. Female seventh sternite, fig. 426Y, tapered to apex and sloping to prominent angles, between which the brownish posterior margin is deeply and angularly notched two-thirds the distance to base. Male plates, fig. 424M, long, broad at base, slightly and concavely narrowed near middle, and together produced to form a rather bluntly pointed apex. Pygofers with dorsal pointed processes.

This species has a northern distribution and is a woodland form. It may occur in northern Illinois.

25. *Paraphlepsius solidaginis* (Walker)

*Acocephalus solidaginis* Walker (1851a, p. 847).  
*Phlepsius nebulosus* Van Duzee (1892a, p. 77).

Length 8 mm. This is probably the largest species of the genus. Vertex roundedly angulate, nearly twice as long at middle as next to eyes, margin sharp, acutely angled with front. Color grayish brown, the paler brown color often caused by the more sparse irrorations or ramose markings. Female seventh sternite, fig. 426S, tapered to apex, lateral angles produced and prominent, between which the posterior margin is broadly, decidedly emarginate; border of emargination practically truncate and slightly notched at middle, black margined. Male plates, fig. 425II, long, concavely narrowed near mid-

dle of outer margins, then produced to bluntly pointed apexes.

This is a typical species of the moist prairie in the eastern states and west to Colorado. It is found also in meadows that are similar to the moist prairies.

**Illinois Records.**—BEACH: Aug. 22, 1906, 1♂. CHAMPAIGN: July 6, 1887, C. A. Hart, 1♀. FOX LAKE: Aug. 6, 1935, DeLong & Ross, 1♂. GALESBURG: 1♀. HOMER: at light, July 11, 1927, Frison & Glasgow, 1♀. PRINCETON: July 12, 1937, Mohr & Burks, 1♂. ZION: July 25, 1935, Frison & DeLong, 1♂, 1♀; Aug. 7, 1935, Ross & DeLong, 1♀.

### 26. *Paraphlepsius certus* (DeLong)

*Phlepsius certus* DeLong (1938*b*, p. 44).

Length 5.5 mm. Slender, brownish; in size, form, and color similar to *irroratus*, but differing in male genital structures. Vertex evenly marked with brown ramose pigment. Two darker spots on each elytron, one at end of claval suture and another about half way between this and apex of scutellum. Male plates, fig. 424*H*, long, slightly and concavely narrowed about half way to apexes, which are bluntly pointed. Aedeagus in lateral view curved upward near base, then bifurcate, a short process extending dorsally, and a broad longer process directed caudally, the latter narrowed near apex. A long dorsally directed spine at the ventrocaudal margin of each pygofer. Female unknown.

This species has been collected only in a fresh-water marsh in Wisconsin.

### 27. *Paraphlepsius electus* (DeLong)

*Phlepsius electus* DeLong (1938*b*, p. 43).

Length 5 mm. In size and form similar to *irroratus*, but paler in color. Vertex bluntly angled, one-half longer at middle than next to eyes, margin rather thin, sharply angled with front. Vertex, pronotum, and scutellum cream colored, rather evenly irrorate with light brown. Elytra irrorate with darker brown.

Male plates, fig. 424*K*, about as long as combined width at base, gradually tapered to blunt apexes. Aedeagus with a ventral and dorsal portion; ventral portion in lateral view narrow at base, strongly and abruptly broadened on apical third with a short dorsal process at apex; dorsal process curved

dorsally at base, then posteriorly, consisting of two lateral pieces that diverge at apex and exceed the ventral portion in length. Each pygofer with a short erect spine on dorsal apical margin.

This species is known only from Illinois and Missouri.

**Illinois Record.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, Frison & DeLong, 1♂.

## 86. *TEXANANUS* Ball

*Texananus* Ball (1918, p. 384).

Head narrower than pronotum. Vertex bluntly angular, sometimes conical, vertex with margin rounded to front. Elytra broad and short.

About 30 species of this genus are recorded from the United States; six of them occur in Illinois. Several others may eventually be found here.

### KEY TO SPECIES

1. Females.....2  
Males.....7
2. Seventh sternite, fig. 428*A*, roundedly produced from base to apex, with two rounded teeth. Length 7.0–7.25 mm...  
.....1. *rufusculus*  
Seventh sternite concavely rounded or notched.....3
3. Seventh sternite broadly and concavely excavated from lateral angles.....4  
Seventh sternite with median half of posterior margin notched or excavated...  
.....5
4. Seventh sternite, fig. 428*C*, excavated half way to base, not exposing lateral margins of underlying membrane.....  
.....2. *superbus*  
Seventh sternite, fig. 428*B*, deeply excavated two-thirds the distance to base, exposing lateral lobes of underlying segment at the sides.....3. *exultus*
5. Seventh sternite, fig. 428*D*, with posterior margin shallowly and angularly sloping to median narrow short V-shaped notch; entire insect tessellate.....4. *areolatus*  
Seventh sternite deeply notched at least half way to base; insect not tessellate...  
.....6
6. Seventh sternite, fig. 428*E*, notched more than half way to base, notch abruptly narrowed half of its way to base, apex rounded.....5. *decorus*  
Seventh sternite, fig. 428*F*, with a broad V-shaped notch, and a narrow rather deep rounded emargination on margin on either side of notch...6. *cumulatus*
7. Plates broad, short, rounded, together almost semicircular in shape, as in fig. 428*G*.....8  
Plates bluntly or rather sharply angled, as in fig. 428*H*.....9

8. Entire insect tessellate; each pygofer, fig. 428G, as broad as long, truncate caudally; aedeagus composed of one process . . . . . **4. areolatus**  
Insect brown, not tessellate; each pygofer, fig. 428J, more than twice as long as greatest width, concavely narrow to pointed caudal apex; aedeagus with a rounded dorsal process and a long straight ventral process . . . . . **2. superbus**
9. Reddish brown in color; length 7.0 mm. or more . . . . . **1. rufusculus**  
Usually darker brown in color; length less than 6.5 mm. . . . . 10
10. Plates, fig. 428H, triangular, together acutely pointed; aedeagus composed of one process . . . . . **3. excultus**  
Plates with apexes rounded, blunt; aedeagus with two processes, a long straight ventral process and a dorsal curved process . . . . . 11
11. Plates, fig. 428L, short and narrow; pygofers pointed caudally; dorsal process of aedeagus long and slender; elytra marked with pale lobate spots . . . . . **5. decorus**  
Plates, fig. 428I, longer and broader, pygofers blunt, rounded caudally; dorsal process of aedeagus short and broad; elytra brown, without lobate spots . . . . . **6. cumulatus**

1. *Texananus rufusculus* (Osborn & Lathrop)

*Phlepsius rufusculus* Osborn & Lathrop (1923, p. 340).

Length 7.0-7.25 mm. Large, robust, resembling *superbus* but larger and more reddish brown in color. Vertex one-fourth longer at middle than next to eyes, obtusely rounded to front; anterior border of vertex ivory yellow. Female seventh sternite, fig. 428A, broadly and roundedly produced from base to form a pair of short broadly rounded teeth separated by a narrow notch. Male plates, fig. 428K, rather long, triangular with bluntly pointed apexes. Aedeagus with a pair of ventral lateral processes, which are divergent, and a median process, which is enlarged at the base and abruptly tapered to a long slender process.

This uncommon species has been collected only in wooded floodplain areas, and its range of habitat is not known. It was previously recorded from Ohio and Missouri.

**Illinois Record.**—MAKANDA: March 27, 1935, Ross & Mohr, 1 ♀.

2. *Texananus superbus* (Van Duzee)

*Phlepsius superbus* Van Duzee (1892a, p. 81).

Length 6 mm. Broad, narrow headed, robust, rather heavily irrorate, dark fuscous.

Vertex roundedly angulate, about one-third longer at middle than next to eyes, rounding to front. Female seventh sternite, fig. 428C, broadly excavated half way to base; apex of emargination occupies about one-third of entire width between lateral angles and is truncate; side margins sinuate. Male plates, fig. 428J, short, broad, together semicircular. Aedeagus with a pair of long ventral processes that are abruptly narrowed on dorsal margin near apex and produced in narrow pointed apexes; dorsal process short, sickle shaped, with the curved apex directed dorsally and anteriorly. Each pygofer long, tapered, concavely narrowed on ventral margin to rather pointed apex.

This is a transcontinental grass-feeding species and occurs in meadows and pastures.

**Illinois Records.**—ANNA: Oct. 11, 1934, DeLong & Ross, 1 ♂. DIXON SPRINGS: July 29, 1934, DeLong & Ross, 16 ♂, 12 ♀; July 9, 1935, DeLong & Ross, 1 ♂.

3. *Texananus excultus* (Uhler)

*Jassus excultus* Uhler (1877, p. 467).

Length 6.0-6.5 mm. Broad, resembling *superbus* in general form and size, but the vertex, pronotum, and scutellum are tawny yellow in contrast to the darker brownish elytra. Commissural line of elytra with white lobate spots. Vertex about one-fourth longer at middle than next to eyes, rounded to front. Female seventh sternite, fig. 428B, broadly excavated two-thirds the distance to base; side margins slightly produced and rounded not far from the lateral margins; plates of underlying sternite exposed at sides of the excavation. Male plates, fig. 428I, broad, triangular, apexes bluntly pointed. Aedeagus with a basal dorsally produced process that is tapered and bluntly pointed; apical portion narrowed, tapered to a slender pointed apex, which is dorsally curved anteriorly, almost touching the basal portion. Pygofers short and pointed, not exceeding plates.

This species is southern in range, feeding on grasses in pastures and in wet areas and prairies.

**Illinois Records.**—CAVE IN ROCK: Oct. 2, 1934, Frison & Ross, 1 ♂, 1 ♀. FERN CLIFF: Aug. 3, 1934, DeLong & Mohr, 2 ♂, 3 ♀. GIBSONIA: Oct. 2, 1934, Frison & Ross, 20 ♂, 12 ♀. KARNAK: Aug. 8, 1934, Ross, DeLong, & Mohr, 1 ♀. MAKANDA: March 26, 1935, Ross & Mohr, 1 ♀. NORRIS CITY:

Oct. 1, 1934, Frison & Ross, 1 ♂. VIENNA:  
 June 29, 1934, DeLong & Ross, 8 ♀.

4. *Texananus areolatus* (Baker)

*Phlepsioides areolatus* Baker (1898b, p. 30).

Length 6 mm. Ivory white, tessellate with brown, fuscous, and black. Vertex one-third longer at middle than next to eyes. Anterior margin sharp, with alternate ivory and black spots; front straight in profile. Irrorations of elytra often forming definite areolar spots. Female seventh sternite, fig. 428D, rather long; posterior margin broadly and shallowly emarginate, a short V-shaped

notch at apex, a brown spot on either side. Male plates, fig. 428G, short, broad, rounded, almost semicircular. Aedeagus composed of a structure that is enlarged dorsally near base and produced, bearing a narrowed anteriorly curved dorsal process; a long ventral process produced ventrally. Pygofers short, broadly truncate.

Recorded previously only from Kansas, this is a typical prairie species and apparently is restricted to the prairie habitat in Illinois.

**Illinois Records.**—CARMAN: July 29, 1936, Mohr & Burks, 2 ♂, 5 ♀; July 13, 1937, Mohr & Burks, 13 ♂, 10 ♀.

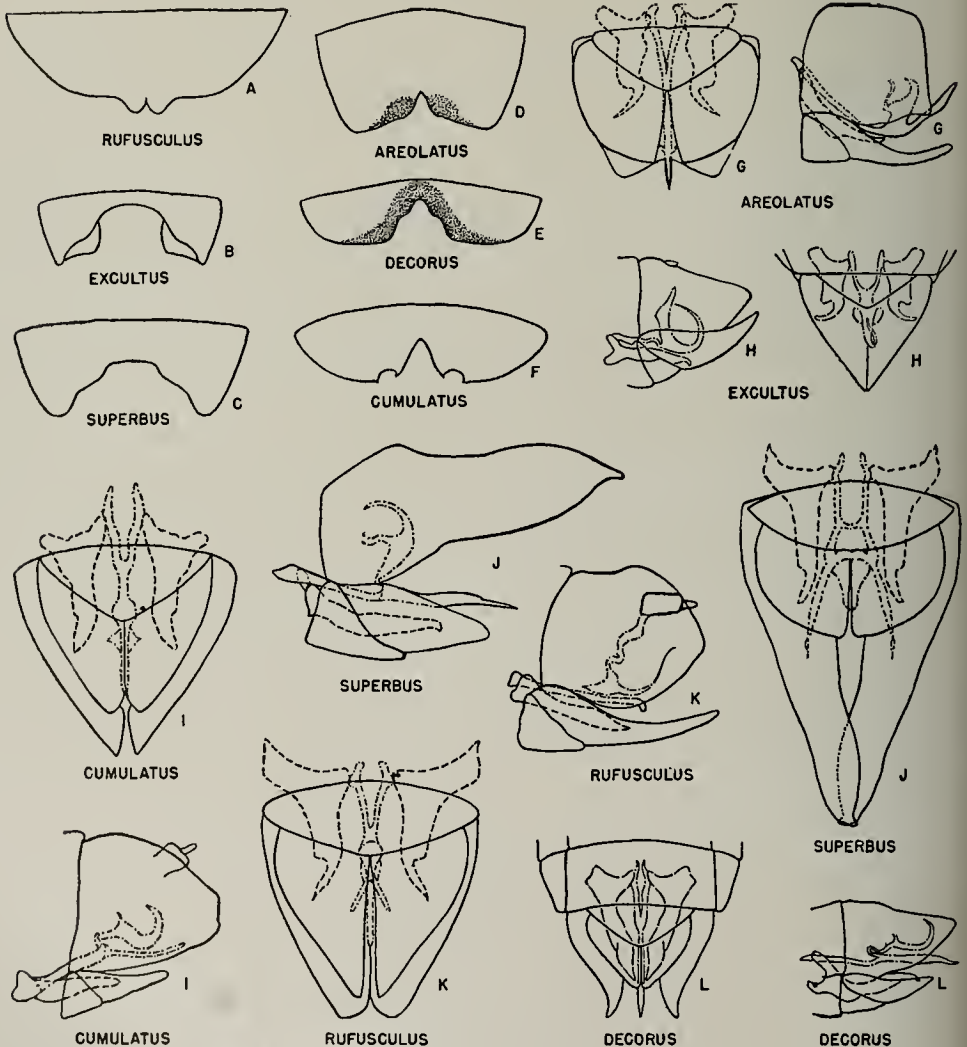


Fig. 428.—*Texananus*. A-F, female seventh sternite; G-L, male genitalia, ventral and lateral aspects.



5. *Texananus decorus* (Osborn & Ball)

*Phlepsius decorus* Osborn & Ball (1897, p. 230).

Length 6 mm. Rather short, robust, whitish, with flaring elytra. Vertex broadly, roundedly angulate, about one-third longer at middle than next to eyes; anterior margin bluntly angled. Vertex, pronotum, and scutellum marked with tawny; a transverse pale band on vertex extended forward to apex at middle. Elytral commissural line on clavus with ivory white lobate spots.

Female seventh sternite, fig. 428E, with lateral margins rounded to posterior margin, which is almost truncate; median fourth broadly, deeply, triangularly excavated two-thirds the distance to the base; sides of excavation sinuate. Male plates, fig. 428L, short and narrow, triangular apexes roundedly angled. Aedeagus with a long slender bladeliike ventral process, and a rather long slender dorsal process with apical third curved dorsally. Pygofer each tapered to a bluntly pointed apex, these widely divergent and excavated laterally.

Throughout Illinois this is a rather common grass-feeding pasture species in moist habitats. It is also found on certain types of prairie. It occurs widely over the eastern United States.

**Illinois Records.**—Males and females, taken June 14 to October 20, are from Alton, Browns, Cairo, Cave in Rock, Cypress, Dubois, Duncans Mills, Elizabethtown, Farina, Fern Cliff, Gibsonia, Golconda, Grand Tower, Havana, Homer, Jonesboro, Marshall, Muncie, Shawneetown, Urbana, Vienna, and Watson.

6. *Texananus cumulatus* (Ball)

*Phlepsius cumulatus* Ball (1900b, p. 202).

Length 6.0–6.5 mm. Broadly oval, robust, reddish brown. Vertex short, scarcely longer at middle than next to eyes; faintly angulate, bluntly rounded to front. The brownish color is distinctly tinged with red. Female seventh sternite, fig. 428F, roundedly produced from base to a narrow rather shallow emargination on either side of a broad V-shaped notch, which extends half way to base. Male plates, fig. 428I, rather short, triangular, with bluntly pointed apexes. Aedeagus with a rather long slender ventral process and a dorsal process that is rather broad at base, narrowed apically, and curved

dorsally. Pygofers short and with apexes bluntly rounded.

As far as known, this species feeds only on the bearberry, *Arctostaphylos*, and is abundant upon that plant on the sandy areas along the shores of Lake Michigan. It is recorded only from the Middle West and Washington.

**Illinois Records.**—BEACH: Aug. 24, 1906, 1♂, 1♀; July 25, 1934, Frison & DeLong, 1♂, 1♀. ZION: July 25, 1934, Frison & DeLong, 74♂, 63♀; Aug. 7, 1935, Ross & DeLong, 7♂, 4♀.

87. *IOWANUS* Ball

*Iowanus* Ball (1918, p. 382).

The head is unusually narrowed, about three-fourths as wide as pronotum, and the anterior lateral margins of the pronotum slope strongly to the eyes. Individuals in the genus are large, 8–10 mm. in length, and the elytra are elongated. The male genitalia are distinct from those of *Texananus*. They can be recognized from the external view by rounded apical pygofer lobes, each of which is usually set off from the pygofer proper by a ventral and a dorsal notch. The female seventh sternite is almost truncate and with a narrow deep median incision.

The species of the genus are known to occur throughout the eastern half of the United States, in Texas, New Mexico, and as far south as the state of Guerrero in Mexico. They resemble each other very closely, but can be distinguished by the differences in genital structures. DeLong (1939b) records five species for the United States, and four of these have been taken in Illinois. The fifth species is known only from New Mexico.

## KEY TO SPECIES

- |  |  |
|--|--|
| 1. Females .....   | 2  |
| Males .....  | 3  |
| 2. Female seventh sternite with median notch appearing U-shaped, extending halfway to base; teeth on each side of median notch long, slender ..... | 3. <i>borrori</i>  |
| .....  | Median notch narrowly V-shaped and teeth on each side of median notch blunt, fig. 429C. .... |
| .....  | 1. <i>majestus</i> , 4. <i>caducus</i>   |
| 3. Apex of each fork of ventral portion of aedeagus, fig. 431, bifid .....   | 2. <i>dicentrus</i>  |
| Apex of each fork of ventral portion of aedeagus pointed, as in fig. 430 .....   | 4  |

4. Ventral portion of aedeagus, fig. 430, bent sharply ventrally and produced apically for more than one-third its length . . . . .  
 . . . . . 3. *borrori*  
 Ventral portion of the aedeagus with the apical portion not sharply bent ventrally, or, if bent, then apical portion very short . . . . . 5  
 5. Apical pygofer lobes, fig. 432, appearing short in lateral view, bent inwardly, not constricted basally; apical branches of ventral aedeagus slender, elongate, in lateral view appearing bent twice . . . . .  
 . . . . . 4. *caducus*  
 Apical pygofer lobes, fig. 429, elongate, ovate, constricted at base; apical branches of ventral portion of aedeagus, short, thick, and curved ventrally . . . . .  
 . . . . . 1. *majestus*

1. *Iowanus majestus* (Osborn & Ball)

*Phlepsius majestus* Osborn & Ball (1897, p. 229).

Length 9–10 mm. Large, broadheaded. Vertex about twice as wide as long, bluntly angled, yellowish, with two approximate dots near apex; a broad black band between anterior halves of eyes, with a straight margin in front, and emarginate on either side of the middle behind and often interrupted at middle.

Seventh sternite of female, fig. 429C, broad, lateral margins almost straight, posterior margin shallowly emarginate on either side of two large divergent acute teeth, which are produced beyond the lateral angles; between these teeth is a deep notch extending one-third the distance to base. Male pygofers, figs. 429A, 429B, each with elongate oval apical lobe, which is constricted at base. Ventral portion of aedeagus cleft at apex, forming two processes that are tapered and curved ventrally for a short distance at tip; dorsal portion of aedeagus with a long slender apical process that curves dorsally and extends almost to dorsal wall of joined pygofers; basal lobe shorter, pointed on caudal margin, and gradually broadened to base by the sloping anterior margin, which reaches base of dorsal portion; apical two-thirds of styles almost parallel margined, scarcely notched before outwardly bent blunt apices. Plates gradually narrowed to bluntly pointed apices.

This is a common species on herbaceous plants in shaded wooded areas. It is found in the East and Middle West.

Illinois Records.—WHITE HEATH: Nov. 13, 1937, J. C. Dirks, 1 ♀. WHITE

PINES FOREST STATE PARK: July 12, 1934, DeLong & Ross, 4 nymphs.

2. *Iowanus dicentrus* (DeLong)

*Texananus dicentrus* DeLong (1939b, p. 236).

Length 8.5 mm. Resembling *majestus* in general form, appearance, and coloration. Vertex bluntly, angularly produced, three-fifths as long at middle as width between eyes; a pair of conspicuous dark spots just above apex; transverse dark band between eyes interrupted at middle, forming a right angled triangular spot on either side, with the base along median line. Pronotum with dark median vermiculate markings just back of vertex.

Male plates, figs. 431A, 431B, long, narrowed to bluntly rounded apices. Pygofers shorter than plates, the caudal lobe of each pygofer elongate and narrow. Ventral portion of the aedeagus forked for about one-fourth of its length at apex, each branch conspicuously bifid at apex, bearing a prominent dorsal and a ventral tooth; dorsal portion of the aedeagus composed of a long slender process that curves caudally and then dorsally almost to the dorsal wall of the joined pygofers, also a shorter dorsal process arising at the base and tapered to a blunt apex. Female unknown.

This species is known only from one male, which was collected in Illinois.

Illinois Record.—FERN CLIFF: Aug. 3, 1934, Mohr & DeLong, 1 ♂.

3. *Iowanus borrori* (DeLong)

*Texananus borrori* DeLong (1939b, p. 237).

Length 9.5 mm. Resembling *majestus* in form and coloration but with bent terminal processes of aedeagus, which are more than one-third as long as basal portion; it also differs by having a long terminal lobe on each pygofer. Vertex broadly, bluntly produced, almost twice as wide between eyes as median length; dark spots on vertex above apex faint; transverse band between eyes dark, broad, interrupted at middle, and each portion broadened at both ends, the end next to either eye bifid. Pronotum with the darker markings on anterior half.

Female seventh sternite with prominent rounded lateral angles, between which the posterior margin is concavely rounded on either side of a rather long sharp-pointed

tooth produced on each side of a U-shaped notch, the notch extending half way to the base of sternite. Male plates, figs. 430A, 430B, long and slender, as long as pygofers. Each pygofer bearing a long rather broad caudal lobe; ventral portion of pygofer short and robust. The apical third of aedeagus bent abruptly ventrally, cleft, and forming two long apical widely separated spines; dorsal portion with a long slender curved process from which arises an elongate dorsal process at base.

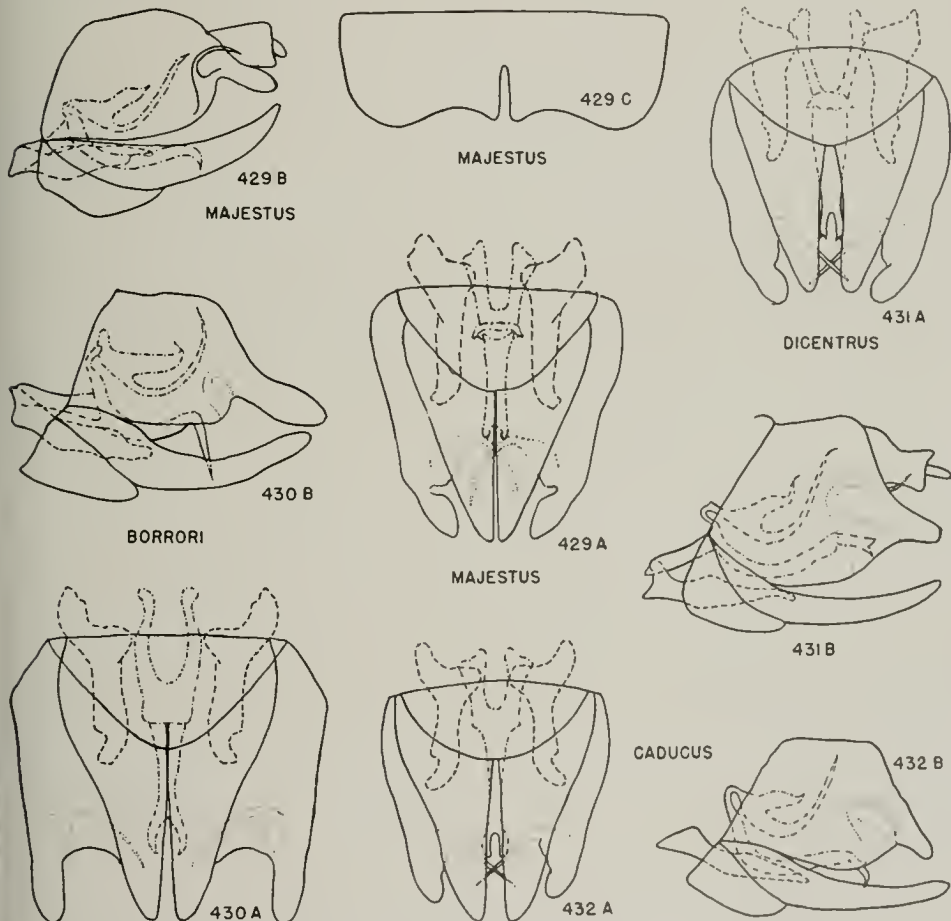
This species is known only from Illinois, Ohio, Wisconsin, and Minnesota. It occurs on rather shaded herbaceous growth in woodland areas.

**Illinois Record.**—WESTERN SPRINGS: Aug. 16, 1935, G. T. Riegel, 1 ♂.

4. *Iowanus caducus* (DeLong)

*Texananus caducus* DeLong (1939b, p. 238).

Length of male 8.0 mm.; female 9.0–9.5 mm. In form and coloration resembling *majestus* but with apical lobe of each pygofer short, blunt, and not indented dorsally or ventrally at base. Vertex broadly, bluntly produced, more than half as long at middle as basal width between the eyes; two small brown spots above apex; transverse band on disc decidedly interrupted at middle, forming a short band either side, the end next to each eye widely bifurcate, the middle portion narrowed, and the portion next to the middle line greatly enlarged caudally. Pronotum heavily infuscated on anterior margin.



Figs. 429–432.—*Iowanus*. A, ventral aspect of male genitalia; B, lateral aspect of male genitalia; C, female seventh sternite.

Female seventh sternite closely similar to that of *majestus* and having a slightly produced blunt tooth on either side of a rather narrow U-shaped notch reaching one-third the distance to the base. Male plates, figs. 432A, 432B, long, tapered to rather narrow rounded apices exceeding pygofers in length. Pygofers with very short rounded caudal lobes, which are not constricted or notched at base. Ventral portion of aedeagus long, apical fourth bent abruptly ventrally and cleft, forming two apical processes, which are each more slender than basal aedeagus body, and they are separated; dorsal portion of aedeagus with a long curved slender ventral process, from the base of which arises a short broader dorsal process.

Recorded from Oklahoma, Tennessee, and Illinois, this is a woodland species occurring on herbaceous vegetation. It is uncommon in Illinois.

**Illinois Records.**—HIGH KNOB: Oct. 3, 1934, Frison & Ross, 1♂. ANVIL ROCK: Oct. 3, 1934, 1♂, 2♀, Frison & Ross. HAVANA: Nov. 8, 1912, 1♀; Aug. 8, 1934, Frison & Mohr, 2♂, 1♀. FERN CLIFF: Aug. 3, 1934, Frison, Ross, Mohr, & DeLong, 1♂.

#### 88. *FIEBERIELLA* Signoret

*Fieberiella* Signoret (1880, p. 67).

Figs. 223, 239D. Broad, robust, vertex flat, more than one-half again as wide between eyes as median length; anterior margin sharp, acutely angled with front. Face almost as broad as long. Elytra broad, opaque, flaring at tip.

This genus contains a single North American species, apparently imported from Europe.

##### 1. *Fieberiella florii* (Stål)

*Selenocephalus florii* Stål (1864, p. 67).  
*Phlepsius atropunctatus* DeLong (1923, p. 131).

Length 7.0–7.2 mm. Dull yellowish, densely irrorate with minute round black spots. Face with two heavy black bands sometimes fused just below vertex margin. Female venter milky white, seventh sternite and pygofers brownish, marked with black spots. Vertex flat, one-half to two-thirds wider between eyes than median length, a little shorter than pronotum, anterior edge sharp.

Female seventh sternite three and one-

half times the length of preceding; side margins strongly curved, covering lateral plates; lateral angles rounded and prominent; posterior margin sinuately concave, with a central shallow notch. Male plates, fig. 243, longer than combined width at base, rather broad, gradually narrowed two-thirds their length, then suddenly constricted and produced; plates greatly exceeded by pygofers, which are keeled at middle.

Known from Connecticut and Illinois, this is a rather common species on shrubs and has been taken from ornamental plantings on the University of Illinois campus, at private homes, and in park areas.

**Illinois Records.**—ALTON: July 27, 1934, DeLong & Ross, 1♂. URBANA: Aug. 8, 1932, 1♀; July 29, 1934, T. H. Frison, 4♀; Aug. 12, 1934, T. H. Frison, 1♂, 2♀; Aug. 16, 1934, DeLong & Ross, 1♂; Sept. 16, 1935, DeLong & Ross, 1♀.

#### 89. *ACINOPTERUS* Van Duzee

*Acinopterus* Van Duzee (1892d, p. 307).

Fig. 212. Head narrower than pronotum, somewhat produced. Pronotum broad and rather short, anterior edge arcuate, sides long. Each elytron narrow, without appendix, apex sharply angled; nervures strong.

Beamer & Lawson (1938) record 26 species and varieties for the United States. All are western in distribution, but one species, *acuminatus*, is also found in the East. It occurs in Illinois.

##### 1. *Acinopterus acuminatus* Van Duzee

*Acinopterus acuminatus* Van Duzee (1892d, p. 308).

Length 5.0–6.5 mm. Varying in color from dull brown to green or yellow, with a sharp-pointed apex at each elytron. Head pale, pronotum variable, usually darker. Elytra fulvous, apex of each dark, nervures pale, often with disc of costa and discal areoles of corium whitish, hyaline; claval suture brown. Vertex short, convex. Female seventh sternite moderately long, posterior margin with a shallow median notch, lateral lobes broadly rounded. Male plates long and narrow, pygofers twice length of plates.

Transcontinental in distribution, this is a very abundant species on grasses and herbaceous plants in pastures, meadows, and wooded areas.

**Illinois Records.**—Many males and females, taken June 5 to September 27, are from Anvil Rock, Cave in Rock, Danville, Dixon Springs, Dubois, Eichorn, Elizabethtown, Equality, Fairfield, Golconda, Grand Tower, Hardin, Havana, Karnak, Keithsburg, La Rue, Marshall, Meredosia, Monticello, Muncie, Oquawka, Pike, Ripley, Rosiclare, St. Anne, Shawneetown, Ursa, Vienna, and White Heath.

90. *BANDARA* Ball

*Bandara* Ball (1931a, p. 93).

Vertex almost flat, wider than long, margins nearly parallel, anterior margin thick and unusually accentuated by markings above and below; vertex definitely angled

with front. There is sometimes a second cross nervure between the sectors of the elytra.

Six species are included in this genus by Knoll (1946); five of them occurring east of the Great Plains region, and the sixth, *animana* (Ball), is known only from Colorado. Two are known from Illinois and the three additional eastern ones may be looked for in future collecting.

KEY TO SPECIES

1. Elytra unicolorous, without spots . . . . . 5. *aurata*
- Elytra with round or oval pale spots . . . . . 2
2. Males . . . . . 3
- Females . . . . . 6
3. Aedeagus having a large preapical dorsal process, partly membranous, both pro-

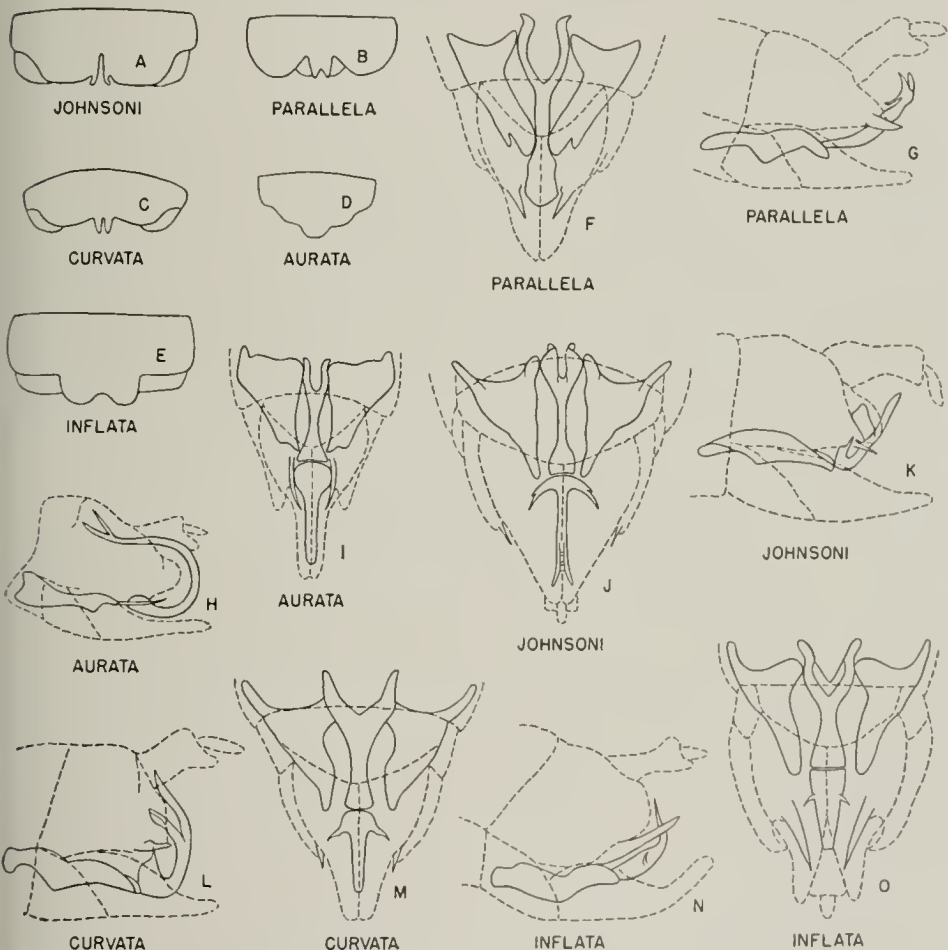


Fig. 433.—*Bandara*: A-E, female seventh sternite; F-O, ventral and lateral views of male genitalia. (Adapted from Knoll.)

- ess and apex broad, the latter cleft at tip, fig. 433M.....2. **curvata**  
 Aedeagus having small processes or none at apex, fig. 433J.....4
4. Base of aedeagus with long lateral processes, fig. 433J; pygofer process slender and minute.....1. **johnsoni**  
 Base of aedeagus with short lateral processes, fig. 433O, or none; pygofer process stout.....5
5. Tip of aedeagus straight and simple; pygofer process nearly as long as apical segment of aedeagus, fig. 433O.....3. **inflata**  
 Tip of aedeagus curved, subdivided into small processes; pygofer process short, less than a fourth as long as apical segment of aedeagus, fig. 433F.....4. **parallela**
6. Apex of seventh sternite having a pair of small, finger-like lobes, figs. 433A and 433C.....7  
 Apex of seventh sternite having broad lobes or only a shallow emargination, figs. 433B and 433E.....8
7. Apical "fingers" of seventh sternite separated by an incision over twice as deep as the length of the finger, fig. 433A.....1. **johnsoni**  
 Mesal incision of seventh sternite no deeper than length of "fingers," fig. 433C.....2. **curvata**
8. Seventh sternite having a broad, emarginate mesal process, fig. 433E.....3. **inflata**  
 Seventh sternite having a narrow, emarginate mesal process, fig. 433B.....4. **parallela**

### 1. *Bandara johnsoni* (Van Duzee)

*Eutettix johnsoni* Van Duzee (1894a, p. 137).

Length 4.8–5.2 mm. Orange yellow, with six black dashes above margin of vertex and an interrupted line beneath; posterior margin of vertex, three stripes on pronotum, and numerous oval spots on the elytra milky white. Corium without supernumerary veinlets. Female seventh sternite, fig. 433A, narrowed at half its length and produced to a roundedly emarginate posterior margin, which is rather deeply, narrowly incised at middle to a slightly produced tooth on either side of incision on posterior margin. Male plates, fig. 433J, convexly narrowed to bluntly pointed produced apices. Aedeagus in ventral view, fig. 433J, curved at base, forming a spine on each outer margin; shaft bifid at apex. In lateral view, fig. 433K, a broad dorsal projection arises near middle and extends back even with base. Styles broad at base, short, tapered to slender pointed apices.

This species occurs in the eastern states and is known to extend as far west as

Ohio. It may be found in Illinois with additional collecting.

### 2. *Bandara curvata* Knull

*Bandara curvata* Knull (1946, p. 260).

Length 4.5–5.0 mm. Resembling *johnsoni* in general appearance and color pattern. A dark line just beneath vertex margin and six dark spots just above. Pronotum with three longitudinal white vittae, and elytra with white areolar spots as in *johnsoni*. Female seventh sternite, fig. 433C, rounded on lateral angles; posterior margin slightly emarginate, a pair of short proximal teeth at middle. Male plates tapered to blunt rounded apices. Styles rather long, apices narrow, blunt. Aedeagus, fig. 433M, broad at base; in lateral view, fig. 433L, it extends dorsally and curves anteriorly, apex bifid with the two portions usually appressed; a process arises at about the middle on the dorsoanterior margin and curves dorsally and anteriorly.

This species occurs on herbaceous or shrubby vegetation in open woodland in the eastern United States and west to Iowa.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, DeLong & Ross, 1 ♀. DONGOLA: Aug. 23, 1916, 1 ♀. DUBOIS: Aug. 8–9, 1917, 3 ♀. ST. JOSEPH: July 30, 1934, T. H. Frison, Jr., 1 ♀. SHAWNEETOWN: June 27, 1936, DeLong & Mohr, 1 ♀. URBANA: Aug. 9, 1920, J. R. Malloch, 1 ♂. VIENNA: June 14, 1934, DeLong & Ross 2 ♂, 1 ♀.

### 3. *Bandara inflata* Knull

*Bandara inflata* Knull (1946, p. 262).

Length 5.0–5.5 mm. In general appearance and color pattern resembling *johnsoni* but usually more orange in color. Female seventh sternite, fig. 433E, short, truncate, median third abruptly produced, forming a broad lobe which is broadly, shallowly indented at middle. Male styles, fig. 433O, narrowed at apices, blunt and divergent, gradually narrowed from bases to rather broad blunt rounded apices. Aedeagus, fig. 433N, curved dorsally, apex divided, forming two divergent attenuate spines; a pair of short spines arise near base on lateral margins.

This species has been recorded from Ohio and North Carolina, and may eventually be found in Illinois.

4. *Baudara parallela* Knull

*Baudara parallela* Knull (1946, p. 263).

Length 4.2-5.0 mm. Resembling *curvata* in general form, color, and appearance, but usually darker in color. Female seventh sternite, fig. 433B, with rounded lobelike lateral angles between which the posterior margin is broadly, rather deeply emarginate, with a broad short spatulate process at its apex; process slightly notched at apex and produced to same length as lateral angles. Male plates, fig. 433F, long, convexly rounded to blunt appressed apices. Styles elongate, with broad blunt rounded apices. Aedeagus, fig. 433G, curved dorsally, with two pairs of lateral processes arising near apex.

This is a common species in the eastern United States.

Illinois Records.—DIXON SPRINGS: June 24, 1936, DeLong & Ross, 1 ♀. ULLIN: May 26, 1932, H. L. Dozier, 1 ♀.

5. *Baudara aurata* (Ball)

*Eutettix aurata* Ball (1909a, p. 81).

Length 4.0-4.5 mm. Small, golden yellow or slightly darker, with a pair of narrow black lines along margin of vertex. Elytra golden, subhyaline, without white spots. Female seventh sternite, fig. 433D, narrow on lateral margins, posterior margin angularly produced to a blunt apex. Male plates, fig. 433I, long, slender on apical halves, apices narrow, appressed. Styles short, broad at bases, sloping to broad apices, which are pointed on inner margins. Aedeagus, fig. 433H, narrow, curved dorsally, then anteriorly beyond the base, apex divided into two long divergent processes.

This species is associated with pine in the Ohio River valley and the eastern portion of the United States. In Illinois we have not found this species on native pines but there is a possibility that it may become established in the extensive areas of pines that are being planted in the reforestation and national forest projects.

91. *EUTETTIX* Van Duzee

*Eutettix* Van Duzee (1892d, p. 307).

Head short, slightly conical, transversely depressed, slightly sloping. Elytra moderately long, usually slightly flaring. Venation simple, one cross nervure between the sec-

tors; elytra without supernumerary veirlets, or ramose lines, and without pigment bands.

The species of this genus are mostly shrub feeders and occur on oak and probably other shrubby growth, chiefly in the western states. Hepner (1942) records 38 species for the United States, 7 of which occur in Illinois.

KEY TO SPECIES

1. Elytra usually dark in color, if light with a paler spot near apex of clavus; color pattern usually evident. . . . . 2  
     Elytra light, white to fulvous, usually about the same throughout, without a light spot near apex of clavus. . . . . 6
2. Pronotum with a distinct dark band near posterior margin. . . . . 3  
     Pronotum without a distinct dark band near posterior margin. . . . . 5
3. Elytra semihyaline, fulvous, sometimes slightly clouded along margin of clavus. . . . . 1. *tristis*  
     Elytra not fulvous semihyaline, either opaque or spotted with opaque areas. . . . . 4
4. Male 5.5 mm. or more in length, female at least 7.0 mm. in length; vertex and scutellum usually orange; ventral fork of each pygofer hook, fig. 434B, greatly widened on outer half. . . . . 2. *pediculus*  
     Male and female less than 5.5 mm. and 7.0 mm., respectively; vertex and scutellum white to yellow; ventral fork of each pygofer hook, fig. 434C, not greatly thickened on outer half. . . . . 3. *pictus*
5. Scutellum pale, with dark basal angles; pygofer hooks, fig. 434D, bifid. . . . . 4. *luridus*  
     Scutellum darker, orange to fulvous, basal angles unicolorous; pygofer hooks, fig. 434E, not bifid. . . . . 5. *marmoratus*
6. Male more than 5.0 mm. in length, and female more than 5.5 mm. in length; ventral fork of each pygofer hook, fig. 434I, about as wide as dorsal forks. . . . . 6. *variabilis*  
     Male and female less than 5.0 mm. and 5.5 mm. in length, respectively; ventral fork of each pygofer hook, fig. 434F, much narrower than dorsal forks. . . . . 7. *quercii*

1. *Eutettix tristis* Ball

*Eutettix subaenea* var. *tristis* Ball (1907, p. 34).

Length of male 5.5 mm.; female 6.5 mm. Resembling *pictus* in general color, but paler and with dorsal fork of each pygofer hook extending as far as ventral fork. Vertex more than twice as wide as length at middle, almost parallel margined, transverse furrow shallow; vertex yellow, with two

large dark spots along anterior margin usually separated by a narrow yellow line, and with a wide dark band covering most of posterior half. Scutellum yellow; elytra semihyaline fulvous, with paler spots at apex of each clavus. Frons yellow, with two large black basal spots.

Female seventh sternite with posterior margin almost straight on either side of a

prominent median lobe. Male pygofer hooks, fig. 434B, bifid, dorsal fork curved abruptly near base, almost parallel margined to pointed apex; ventral fork narrowest on basal third, much broader near middle, pointed at apex. Aedeagus almost parallel margined on basal three-fifths, gradually narrowing to a rounded apex, which bears a pair of short processes on dorsal margin.

Female seventh sternite with the posterior

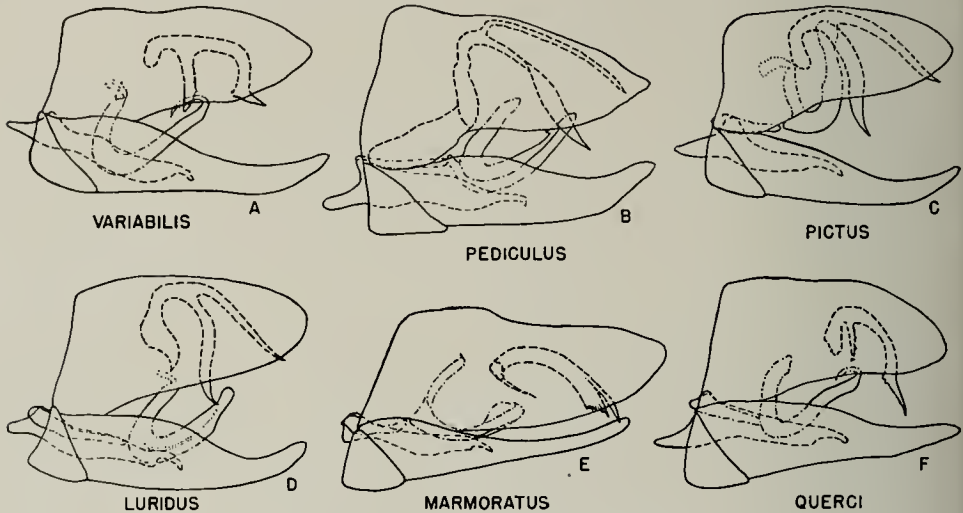


Fig. 434.—*Eutettix*. A-F, male genitalia.

produced median lobe. Each male pygofer hook bifid, bent near base, widest near middle, apex pointed; ventral fork widest near base, extending about as far as dorsal fork, pointed at apex; aedeagus almost parallel margined to outer third, narrowing to a bluntly pointed apex, which bears a pair of short processes on dorsal margin.

Recorded previously from the eastern states, this species has been taken in Illinois.

**Illinois Records.**—ALTON: June 26, 1934, DeLong & Ross, 1 ♂. ASHLEY: Aug. 7, 1917, 1 ♀. DUBOIS: Aug. 8-10, 1917, 4 ♀. GRAFTON: along river, June 26, 1934, DeLong & Ross, 1 ♀. MEREDOSIA: Aug. 19, 1917, 1 ♀.

## 2. *Eutettix pediculus* Hepner

*Eutettix pediculus* Hepner (1942, p. 273).

Length of male 5.75 mm.; female 7.0 mm. Resembling  *pictus* in general appearance but larger and with distinctive male genitalia. Vertex about twice as wide between eyes at base as median length, almost parallel margined, transverse furrow shallow. Ver-

margin almost straight on either side of a prominent median lobe. Male pygofer hooks, fig. 434B, bifid, dorsal fork curved abruptly near base, almost parallel margined to pointed apex; ventral fork narrowest on basal third, much broader near middle, pointed at apex. Aedeagus almost parallel margined on basal three-fifths, gradually narrowing to a rounded apex, which bears a pair of short processes on dorsal margin.

This species is known to occur in some of the eastern states and in the Middle West.

**Illinois Records.**—ELIZABETHTOWN: July 8, 1935, Ross & DeLong, 1 specimen. ROSICLARE: July 5, 1935, Frison & Mohr, 1 specimen. ST. ANNE: Aug. 4, 1936, Frison & Burks, 1 ♂. THEBES: July 11, 1935, DeLong & Ross, 2 specimens.

## 3. *Eutettix pictus* Van Duzee

*Eutettix pictus* Van Duzee (1892c, p. 301).  
*Eutettix magnus* Osborn (1900c, p. 395).

Length 5-6 mm. Elytra dark brown to black, each with a yellow spot. Vertex,



pronotum, and scutellum yellow. Anterior half of vertex and posterior half of pronotum black. Elytra shiny black; usually a commissural spot on each clavus anterior to apex, and the anterior two-thirds of costal margin pale yellow; spots often lacking in dark male specimens. Face black, with a broad yellow band beneath eyes. Female seventh sternite with the posterior margin broadly and concavely excavated, with a median short blunt tooth. Each male pygofer hook, fig. 434C, bifid, with ventral fork broader than and slightly longer than dorsal fork, bent near base, gradually broadened to outer third, apex pointed. Aedeagus largest near middle, narrowing to a bluntly pointed apex, which bears a pair of short processes on dorsal margin.

This is one of the most brilliantly marked of all the species of the genus. It is recorded from the eastern states and has been taken from oak in different parts of Illinois.

**Illinois Records.**—Males and females, taken June 14 to November 19, are from Alton, Ashley, Dubois, Grand Tower, Havana, Herod, Karnak, Makanda, Meredosia, Oquawka, St. Anne, Shawneetown, and White Heath.

#### 4. *Eutettix luridus* (Van Duzee)

*Thamnottettix lurida* Van Duzee (1890b, p. 250).

Length 6 mm. Vertex, pronotum, and scutellum fulvous, elytra testaceous brown, subhyaline on costal area, the commissural spots on the apical half of each clavus and often the apex of scutellum creamy yellow. Face light brown, sutures darker. Female seventh sternite roundedly produced, slightly notched on either side of a short median produced tooth. Each male pygofer hook, fig. 434D, bifid, dorsal fork shorter than ventral, gradually narrowed to form a sharp apex; ventral fork slightly broader than dorsal, almost parallel margined to a sharp apex. Aedeagus largest at middle, narrowing on apical third to a rounded apex; in ventral view appearing bifid on outer third.

This species, taken from oak shrubs, apparently lives upon the host plant. It is recorded only from the eastern states.

**Illinois Records.**—Males and females, taken April 30 to November 22, are from Alto Pass, Carlinville, Dubois, Metropolis, Oakwood, Paris, Shawneetown, and White Heath.

#### 5. *Eutettix marmoratus* Van Duzee

*Eutettix marmoratus* Van Duzee (1892c, p. 302).

*Eutettix incerta* Gillette & Baker (1895, p. 100).

Length 5.5–6.0 mm. Vertex yellow; with a line in the transverse depression, two spots at apex, four spots along the base, and the median impressed line testaceous. Pronotum with traces of six testaceous longitudinal stripes. Elytra subhyaline, with testaceous brown blotches, paler on costa; usually a faint white or pale spot along commissural line on clavus; this obscured in dark-colored males. Female seventh sternite broadly excavated on either side of a short median apical tooth. Each male pygofer hook, fig. 434E, extending almost to apex of pygofer, broadest on outer third. Aedeagus almost parallel margined, with a pair of slender apical processes about one-third the length of the aedeagus shaft.

This species has been collected from oak and is found in rather small numbers upon that plant. It occurs in the eastern states and west to Colorado.

**Illinois Records.**—ALTON: June 26, 1934, DeLong & Ross, 1 specimen. APPLE RIVER CANYON STATE PARK: July 11, 1934, DeLong & Ross, 1 specimen. OREGON: Aug. 23, 1935, 1 specimen.

#### 6. *Eutettix variabilis* Hepner

*Eutettix variabilis* Hepner (1942, p. 269).

Length of male 5.5 mm.; female 6.5 mm. Resembling *querci* in general appearance, but larger and with distinctive male genitalia. Vertex about twice as wide as length at middle, almost parallel margined, transverse furrow usually distinct. Vertex, pronotum, and scutellum pale to darker yellow; males darker in color than females. Elytra semihyaline, veins of elytra usually concolorous.

Female seventh sternite with posterior margin excavated on each side of a median lobe, which is sometimes notched at middle. Each male pygofer, fig. 434A, long, two-thirds as wide at constriction as length from there to pointed apex; each pygofer hook bifid, dorsal fork curved ventrally just beyond middle and curved posteriorly near apex, ventral fork barely reaching to margin of pygofer, straight or slightly curved anteriorly. Aedeagus long, widest near base,

then almost parallel margined throughout its length to a pair of apical processes, which are about one-third the length of shaft.

This species was recorded previously only from Arkansas.

Illinois: Record.—ALTON: June 26, 1934, DeLong & Ross, 1 ♂, 3 ♀.

### 7. *Eutettix querci* Gillette & Baker

*Eutettix querci* Gillette & Baker (1895, p. 101).

Length of male 4.75 mm.; female 5.5 mm. Rather uniformly colored, with distinctive male genitalia. Vertex about twice as wide as median length, with a distinct transverse furrow. Vertex, pronotum, and scutellum yellowish green in the male, fulvous in the female. Elytra semihyaline, fulvous in the male, with veins darkened posteriorly, more opaque in the female and tinged with green.

Female seventh sternite with the posterior margin excavated on each side of a rounded median lobe. Each male pygofer hook, fig. 434F, bifid, dorsal fork about twice as long as ventral, almost parallel margined to outer fourth, curved ventrally on outer fourth and posteriorly on outer fifth; prominent teeth along ventral margin; ventral fork slender, and straight to a pointed apex. Aedeagus almost parallel margined throughout to a pair of apical processes, which are about one-third the length of the shaft, in ventral view parallel margined and bifid on outer sixth.

This species was recorded previously from Colorado, New Mexico, and Texas.

Illinois Records.—ALTON: June 26, 1934, DeLong & Ross, 1 ♂, 10 ♀. GOLCONDA: June 22, 1932, Ross, Dozier, & Park, 1 ♂.

### 92. *CHLOROTETTIX* Van Duzee

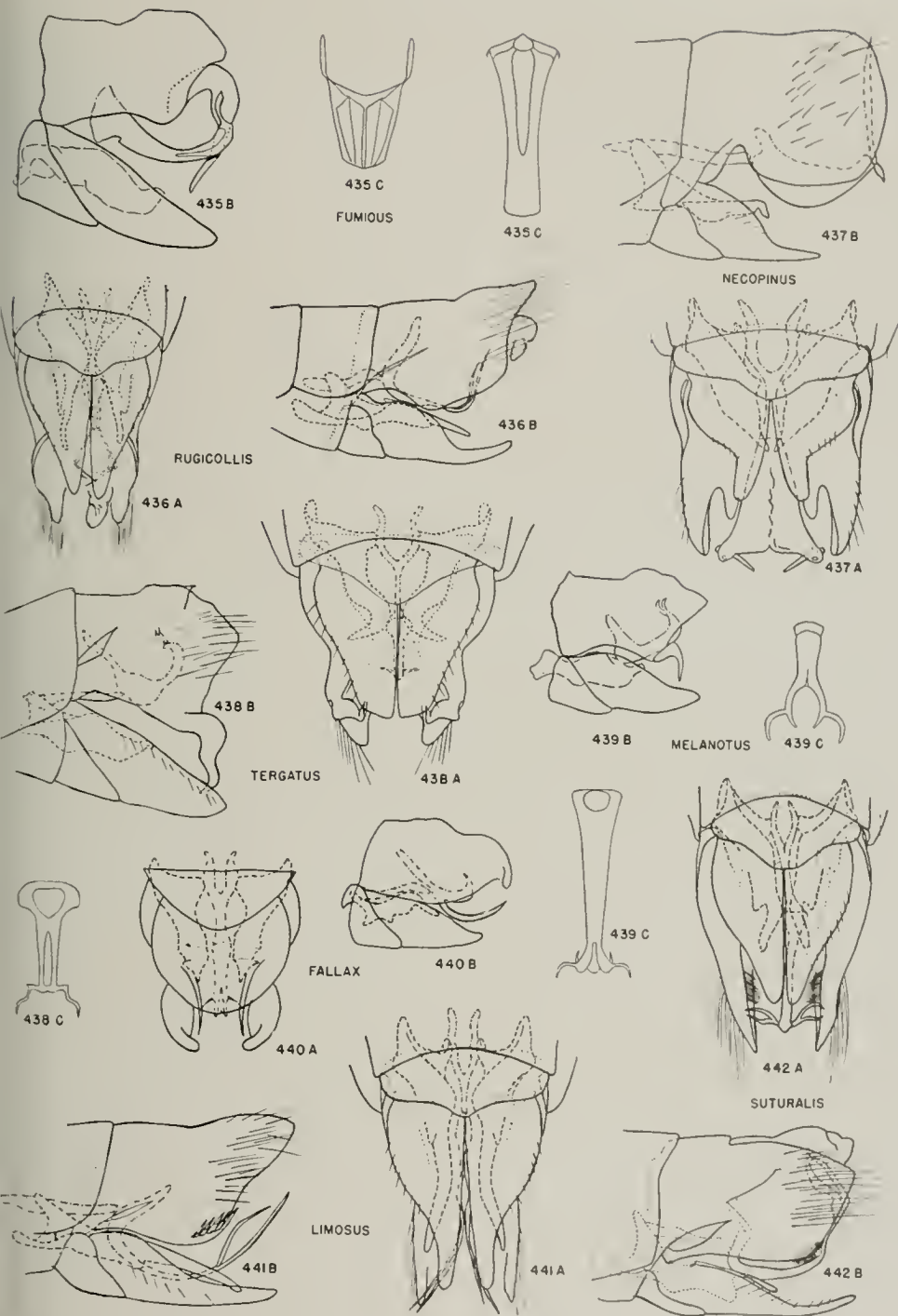
*Chlorotettix* Van Duzee (1892d, p. 306).

Fig. 204. Vertex varying from broadly rounded to bluntly angled and from a condition where the anterior margins are approximately parallel, to a well-produced vertex with the central portion much longer than next to eyes. Venation of elytra simple. Front broad. Leafhoppers of this genus are usually rather large in size, 6–8 mm., and are of some shade of pale green or yellowish green. Comparatively few bear color markings. They are closely related to certain of the species formerly included in the genus *Thamnotettix*.

More than 50 described species of *Chlorotettix* are now represented in the North American fauna, and half of these have already been taken in Illinois.

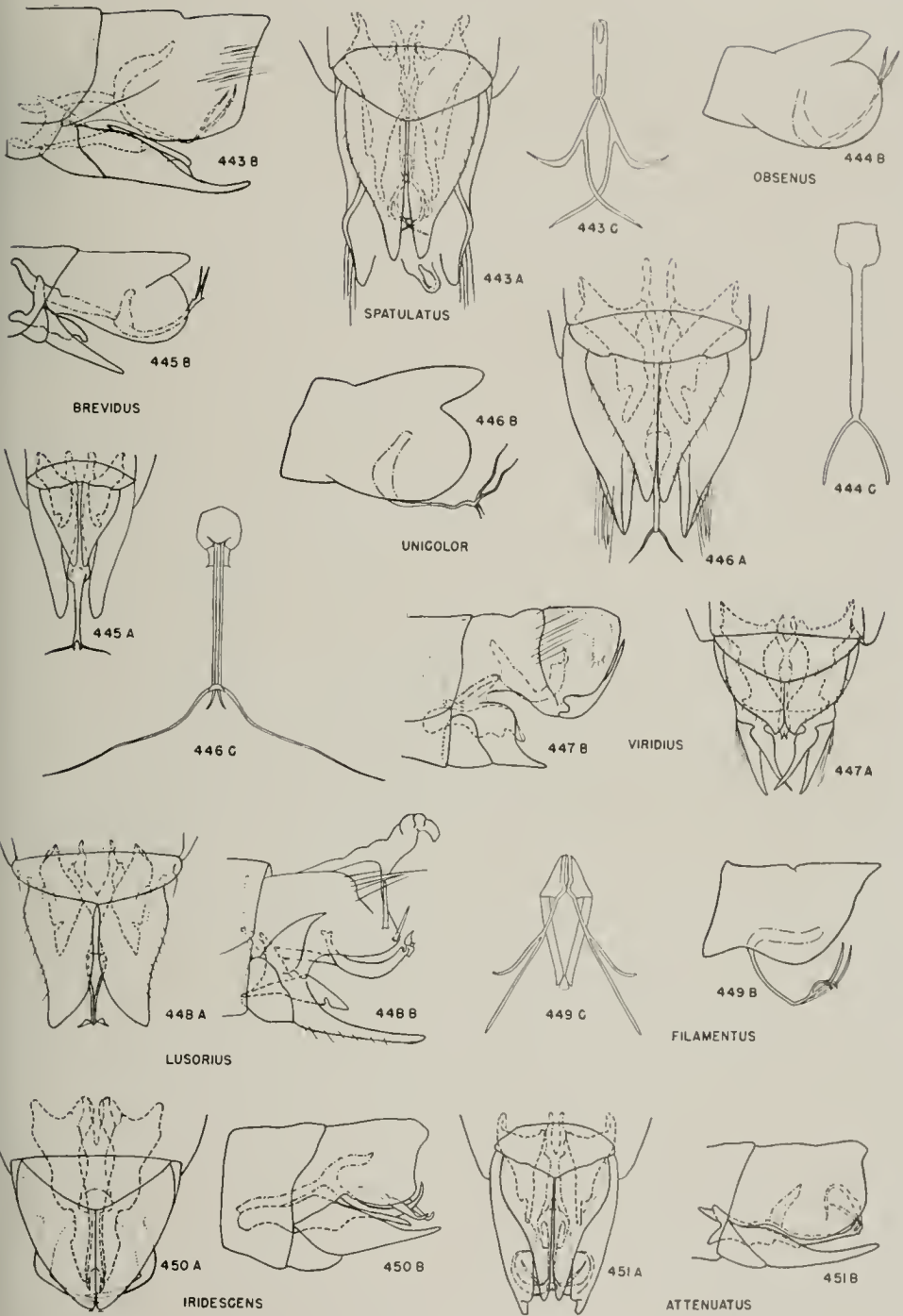
#### KEY TO SPECIES

1. Vertex with a broad red marginal band between the eyes.....1. **rugicollis**  
Vertex uniform green or yellowish green, without distinct red marginal band...2
2. Females.....26  
Males.....3
3. Vertex with anterior margin rounded, sometimes broadly rounded; length at middle equaling or slightly exceeding length next to eyes.....4  
Vertex with anterior margin distinctly but bluntly angled, length at middle decidedly greater than next to eyes....16
4. Dark in color, smoky, brownish or sordid green.....5  
Lighter in color, some shade of pale green or yellow.....9
5. Vertex with a broad transverse brown band between eyes; elytra dark brown, nervures pale, appearing striped.....  
.....2. **necopinus**  
Vertex without a transverse band between eyes.....6
6. A broad heavy ventrally directed spine arising on the middle of each caudal pygofer margin, fig. 435; apex of aedeagus gradually broadened, with a short straight process on each outer margin.....  
.....3. **fumidus**  
Pygofer spine shorter and narrower, arising on ventrocaudal portion of each pygofer, as in fig. 440.....7
7. Each pygofer spine, fig. 440, narrow, about uniform in width, curved dorsally; aedeagus foot shaped, with the toe turned upward.....4. **fallax**  
Each pygofer spine broad at base, tapered to slender apex, curved ventrally, as in figs. 438, 439.....8
8. Aedeagus in lateral view, fig. 438, narrowed on apical third, apical processes curved but not branched.....  
.....5. **tergatus**  
Aedeagus in lateral view, fig. 439, not narrow before apical processes, which are branched.....6. **melanotus**
9. Vertex with a darker blotch on either side of apex. A smoky to bronze trilobate stripe extending along the claval wing margin. Male aedeagus, fig. 442, with short rather broad bifurcate processes at apex.....7. **suturalis**  
Vertex without dark blotches; elytra not marked by a sutural stripe.....10
10. Male plates longer than combined basal width, tapered to acute apexes, as in fig. 441.....11  
Male plates shorter, combined width at base equaling twice their length, apexes broadly, convexly rounded, as in fig. 447.....15
11. Terminal filamentous aedeagus processes bifurcate or branched, as in fig. 441.....12



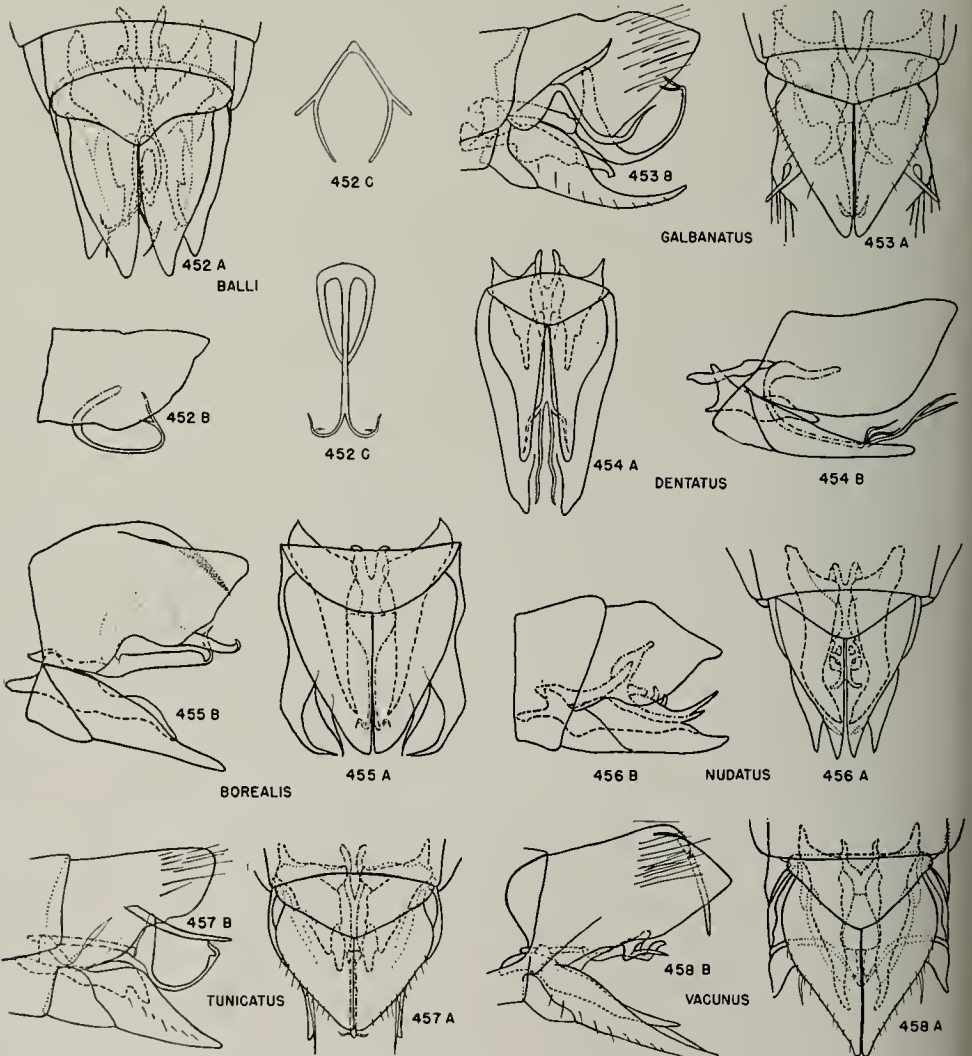
Figs. 435-442.—*Chlorotettix*, male genitalia. A, ventral aspect; B, lateral aspect; C, apical portion of aedeagus.

- Terminal filamentous aedeagus processes not branched or bifurcate. . . . . 13
12. Styles, fig. 441, extending beyond plates, conspicuous as black processes. Plates produced as narrow tips. Aedeagus with bifurcate slender terminal processes three times the length of the body of aedeagus. . . . . **8. limosus**  
 Styles, fig. 443, shorter, not visible beyond plates. Apexes of plates more pointed and not so greatly produced. Aedeagus with bifurcate terminal processes that are less than twice the length of the body of aedeagus. . . . . **9. spatulatus**
13. Aedeagus with a pair of very short processes between the longer processes at the end of the body of aedeagus, outer processes more than half as long as body of aedeagus, as in fig. 445. . . . . 14  
 Aedeagus, fig. 444, without short processes between terminal processes of aedeagus body; terminal processes not more than half as long as body of aedeagus. . . . . **10. obsenus**
14. Terminal aedeagus processes, fig. 445, decidedly shorter than aedeagus body. . . . . **11. brevidus**  
 Terminal aedeagus processes, fig. 446, at least as long as body of aedeagus. . . . . **12. unicolor**
15. Each male plate, fig. 447, broader at base than long. Each style short, broad, broadly truncate at apex. . . . . **13. viridius**  
 Each male plate, fig. 440, more broadly and convexly rounded at apex, length equaling basal width. Each style long, broad, notched on outer margin near apex, which is abruptly narrowed and sharp pointed. . . . . **4. fallax**
16. Vertex usually with a distinct brown median transverse band between eyes. . . . . **14. lusorius**  
 Vertex without a transverse brown band. . . . . 17
17. Uniformly bronze iridescent in color. . . . . **15. iridescens**  
 Not bronze iridescent, usually lighter, some shade of green or yellow. . . . . 18
18. Styles distinctly notched on outer margins near apexes, forming a straight or curved finger-like process on inner margin, as in fig. 451. . . . . 19  
 Styles not notched on outer margin near apexes, gradually tapering to blunt apexes, as in fig. 455. . . . . 23
19. Terminal processes of aedeagus branched or bifurcate. . . . . 20  
 Terminal processes of aedeagus not branched or bifurcate. . . . . 22
20. Each pygofer, fig. 451, rounded caudally, shallowly and concavely indented on dorsal half. . . . . **16. attenuatus**  
 Each pygofer sloping obliquely from rounded ventrocaudal margin to produced dorsocaudal margin, as in fig. 452. . . . . 21
21. Apical processes, fig. 452, short, not exceeding one-third of ventral aedeagus body, with very short lateral branches on outer margins at middle. . . . . **17. balli**
- Apical processes, fig. 449, long, about equaling length of ventral aedeagus body; lateral branches about one-third the length of apical processes and arising about one-third the distance from base. . . . . **18. filamentus**
22. Finger process at apex of each style, fig. 453, curved outwardly, apex of aedeagus with two processes. . . . . **20. galbanatus**  
 Finger process at apex of each style, fig. 454, longer, straight; apex of aedeagus with four processes. . . . . **19. dentatus**
23. Each pygofer, fig. 455, with two spines, a conspicuous dorsal spine curved ventrally and a conspicuous ventral spine curved dorsally. . . . . **21. borealis**  
 Each pygofer, fig. 456, with not more than one caudal spine. . . . . 24
24. Each pygofer, fig. 456, sloping on dorsal and ventral surfaces to a bluntly pointed apex, without a caudal spine. . . . . **22. nudatus**  
 Each pygofer with caudal spine, as in fig. 457. . . . . 25
25. A long spine, fig. 458, on dorsal margin of each pygofer directed ventrally. . . . . **23. vacunus**  
 A long straight spine, fig. 457, arising on ventrocaudal margin of each pygofer and directed caudad. . . . . **24. tunicatus**
26. Vertex with anterior margin rounded, sometimes broadly rounded, length at middle equaling or slightly exceeding length next to eyes. . . . . 27  
 Vertex with anterior margin distinctly but bluntly angled, length at middle decidedly greater than next to eyes. . . . . 37
27. Dark in color, smoky, brownish, or sordid green. . . . . 28  
 Lighter in color, some shade of pale green or yellow. . . . . 31
28. Vertex with a broad transverse brown band between eyes; elytra dark brown, nervures pale, appearing striped. . . . . **2. necopinus**  
 Vertex without a transverse band between eyes. . . . . 29
29. Length 7.5–8.0 mm. . . . . **3. fumidus**  
 Length not over 7.0 mm. . . . . 30
30. Sordid green; northern in distribution. . . . . **5. tergatus**  
 Usually darker, tinged with black; southern in distribution. . . . . **6. melanotus**
31. Seventh sternite deeply notched on either side of a central spatulate process extending from apex of notch, as in fig. 459C. . . . . 32  
 Seventh sternite notched or excavated but without a spatulate process, as in fig. 460G. . . . . 35
32. Spatulate process of seventh sternite cleft at apex, fig. 460N. . . . . **8. limosus**  
 Spatulate process not cleft at apex, fig. 459C. . . . . **9. spatulatus**
33. Seventh sternite deeply, broadly notched, each side of notch bearing a lateral median tooth, fig. 460G. . . . . **13. viridius**  
 Seventh sternite broadly, concavely rounded or notched but without teeth on lateral margin. . . . . 34



Figs. 443-451.—*Chlorottettix*, male genitalia. A, ventral aspect; B, lateral aspect; C, apical portion of aedeagus.

34. Vertex with a darker blotch on either side of apex; a smoky to bronze trilobate stripe extending along the claval margin of each elytron. . . . . **7. suturalis**  
 Vertex without dark blotches; elytra not marked by sutural stripes. . . . . 35
35. Seventh sternite broadly, concavely rounded with a narrow V-shaped notch at apex, the entire concave margin dark brown, fig. 459E. . . . . **4. fallax**  
 Seventh sternite broadly, angularly excavated, side of notch sloping to a narrow V-shaped notch at apex, as in fig. 460M. . . . . 36
36. Length 6.5-7.0 mm., darker green, veins dark green. . . . . **10. obsenus**  
 Length 7.5-8.0 mm., usually yellowish green in color. . . . . **12. unicolor, 11. brevidus**
37. Vertex usually with a distinct brown median transverse band between eyes. . . . . **14. lusorius**  
 Vertex without a transverse brown band. . . . . 38
38. Uniformly bronze iridescent in color. . . . . **15. iridescens**  
 Not bronze iridescent, usually lighter, some shade of green or yellow. . . . . 39
39. Seventh sternite deeply notched each side of a median spatulate process, which is produced from the apex. . . . . 40  
 Seventh sternite without a spatulate process. . . . . 41
40. Spatulate process, fig. 459A, short and broad. . . . . **16. attenuatus**  
 Spatulate process, fig. 460E, longer, more slender. . . . . **17. balli**



Figs. 452-458.—*Chlorotettix*, male genitalia. A, ventral aspect; B, lateral aspect; C, aedeagus.

41. Seventh sternite, fig. 459B, roundedly produced, with a small median notch and a larger one on either side forming a pair of short blunt approximate teeth  
 19. *dentatus*  
 Seventh sternite notched or elevated, not produced, and without produced teeth  
 42  
 42. Seventh sternite appearing somewhat truncate, with a deep notch at middle  
 43  
 Seventh sternite not appearing truncate, but notched or excavated from the rather narrow lateral angles  
 44  
 43. Posterior margin of seventh sternite, fig. 459D, slightly indented between posterior angles, with a broad V-shaped notch at middle extending two-thirds the distance to base  
 21. *borealis*  
 Posterior margin, fig. 460C, slightly, convexly rounded either side of a deep narrow U-shaped notch extending two-thirds the distance to base  
 20. *galbanatus*  
 44. Length not over 6.5 mm. . . . . 45  
 Length 7.0 mm. or more . . . . . 46  
 45. Lateral margins of notch of seventh sternite, fig. 460I, evenly, convexly narrowed, apex pointed  
 23. *vacuus*  
 Lateral margins of notch, fig. 460J, concavely rounded near posterior margin of sternite, then convexly rounded to a rounded apex  
 25. *distinctus*  
 46. Seventh sternite, fig. 460K, with posterior margin in the form of a brace sign, broadly concave, with a short median notch, the entire margin heavily embrowned. . . . . 22. *nudatus*  
 Seventh sternite, fig. 460L, with posterior margin broadly, concavely rounded with a brown V-shaped spot at apex. . . . . 24. *tunicatus*

Aedeagus with four long processes at apical end that are bent dorsally; basal third of aedeagus also curved dorsally, the sides nearly parallel.

This species is a common grass association species in Florida and along the Gulf Coast

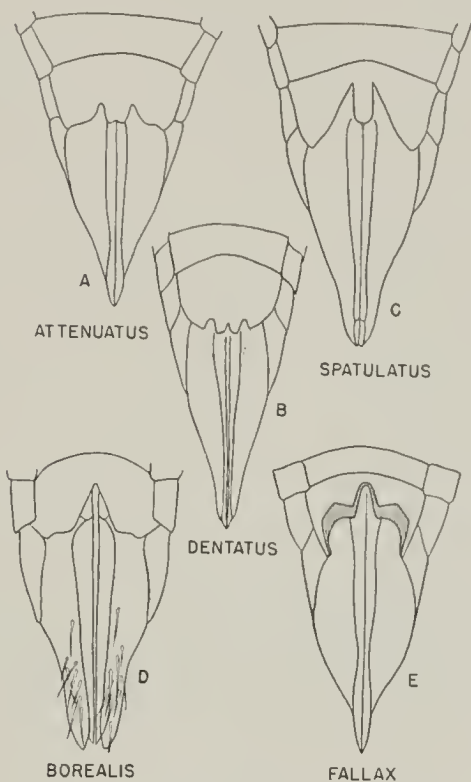


Fig. 459.—*Chlorotettix*. A-E, female genitalia.

I. *Chlorotettix rugicollis* Ball

*Chlorotettix rugicollis* Ball (1903, p. 230).

Length 7 mm. Pale green, resembling *spatulatus* but with a broader vertex and a conspicuous red or pale orange transverse band on the margin of the vertex and front between the eyes; specimens from the Gulf of Mexico area are more darkly marked. The elytra of the males are often tinged with tawny brown. Vertex broadly rounded, only slightly longer at middle than next to eyes, about two and one-half times wider than long, evenly rounded to front.

Female seventh sternite deeply and triangularly excavated, with a strap-shaped tooth similar to that in *spatulatus* extending posteriorly from the apex of excavation. Male plates, fig. 436, long, triangular. Style elongate, triangular, gradually sloping from base to narrowed produced finger-like apex.

and southern Atlantic Coast. Its occurrence in the old lake basin south and west of Chicago is unusual and interesting, but it is found in an association with several other Florida species of leafhoppers.

Illinois Records.—ALSI: Aug. 23, 1934, DeLong & Ross, 6♂, 7♀. EVERGREEN PARK: Aug. 23, 1934, DeLong & Ross, 42♂, 52♀. GIBSONIA: Oct. 2, 1934, DeLong & Ross, 1♀. OAK LAWN: in lamp globe, Aug. 22, 1934, DeLong & Ross, 36♂, 11♀. OQUAWKA: scrub oak, July 3, 1934, DeLong & Ross, 1♂, 1♀. ST. ANNE: July 20, 1934, DeLong & Ross, 1♂; Aug. 21, 1934, DeLong & Ross, 11♂, 7♀. SUMMIT: July 17, 1935, DeLong & Ross, 5♂, 5♀. WAUKEGAN: Aug. 24-26, 1917, 5♂. ZION: July 16, 1936, DeLong & Ross, 1♂.

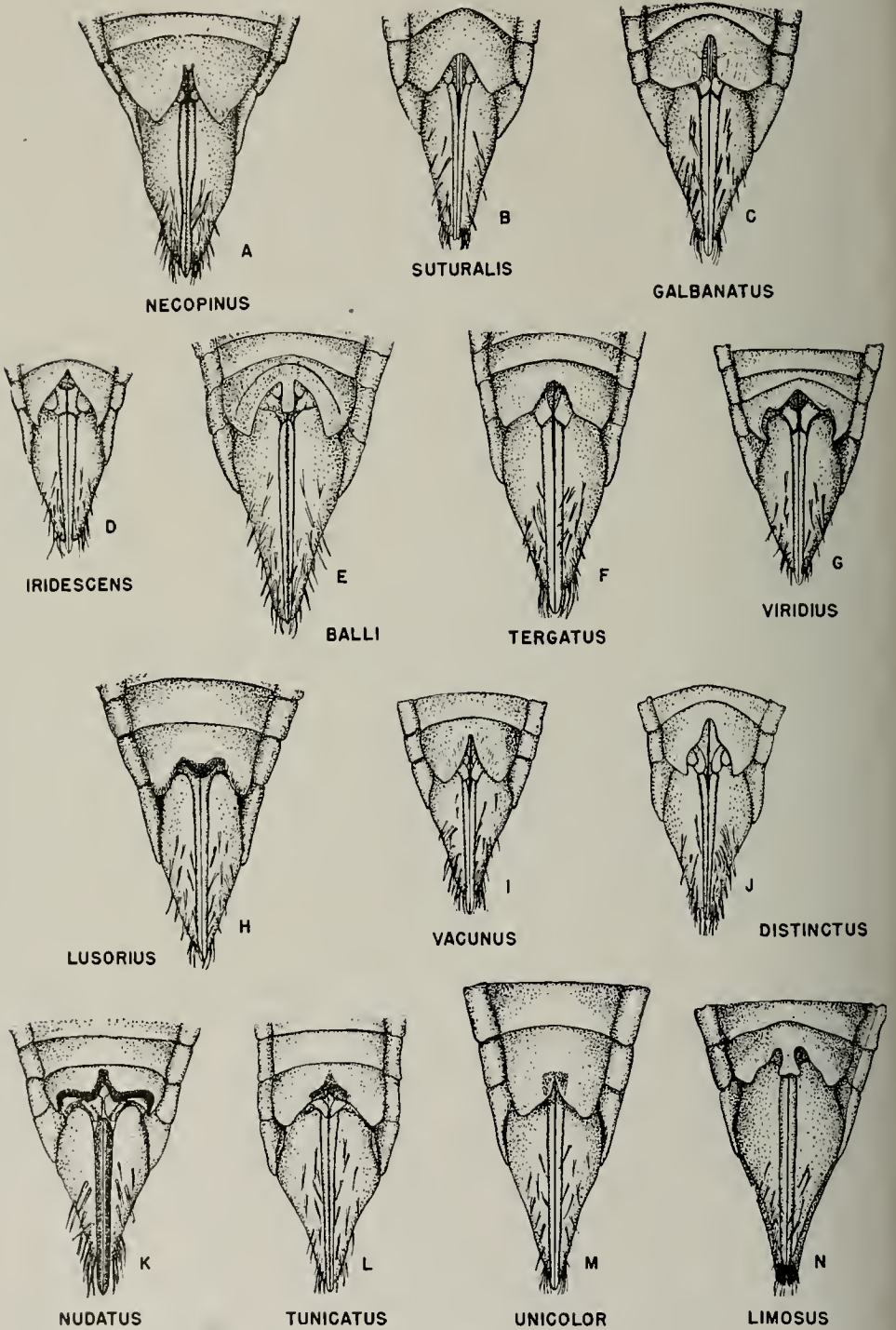


Fig. 460.—*Chlorotettix*. A-N, female genitalia.



2. *Chlorotettix necopinus* Van Duzee

*Chlorotettix necopinus* Van Duzee (1893, p. 282).

Length 6.5-7.5 mm. Greenish testaceous, with a broad transverse blackish band on disc between eyes, elytra fuscous brown, with white nervures. Posterior margin of seventh sternite of female, fig. 460*A*, deeply and rather broadly incised nearly to its base. Male plates, fig. 437, broad at bases, suddenly constricted and then produced, tips divergent. Aedeagus in ventral view greatly broadened at apex; in lateral view narrowed toward apex, with a long spine on either side directed dorsally and extending to dorsal margin of pygofer, which is broadly rounded caudally. Styles rather short, broad at bases, tapered to pointed apices that are convergent.

A common species in grassy meadows in the southern United States, *necopinus* occurs in the southern part of Illinois in wooded grassy areas.

**Illinois Records.**—Males and females, taken June 14 to October 2, are from Cave in Rock, Dixon Springs, Eichorn, Elizabethtown, Fern Cliff, Golconda, Herod, Jonesboro, Mount Carmel, Shawneetown, and Vienna.

3. *Chlorotettix fumidus* Sanders & DeLong

*Chlorotettix fumidus* Sanders & DeLong (1919, p. 237).

*Chlorotettix fuscus* Brown (1933, p. 243).

Length 7.5-8.0 mm. Smoky green, resembling *tergatus* in form and coloration. Vertex produced, one-half longer at middle than next to eyes and about twice as wide as long. Elytra dark, smoky. Posterior margin of female seventh sternite truncate or slightly concave, with a broad deep median notch at middle extending two-thirds the distance to base. Male plates, fig. 435, short and broad, convexly rounded to appressed tips. Aedeagus with apex broadened and bearing a pair of dorsally directed processes on outer margins of broadened portion. A heavy elongate spine arising from caudoventral concavity of each pygofer and curved ventrally.

This species is found in coarse grasses, usually in marshy or swamp habitats. It is recorded only from Pennsylvania and Tennessee.

4. *Chlorotettix fallax* Sanders & DeLong

*Chlorotettix fallax* Sanders & DeLong (1922, p. 94).

*Chlorotettix latifrons* Sanders & DeLong (1922, p. 95).

Length 7.5-8.0 mm. Large, dull greenish yellow, with broadly rounded vertex, twice as wide as long, and elytra smoky at apexes. Female seventh sternite, fig. 459*E*, with posterior margin strongly, concavely excavated half way to base, with a V-shaped notch at middle extending entirely to base; posterior margin and notch broadly bordered with dark brown. Male plates, fig. 440, strongly, convexly rounded, semi-circular in outline, width of plates at bases together twice their length. Each pygofer sloping ventrally and dorsally to bluntly pointed apex, a long, curved spine arising from ventrocaudal margin. Aedeagus foot shaped, with the toes turned upwards. Each style rather broad, notched near base on inner margin and near apex on outer margin, abruptly sloping from both margins to form pointed apex.

This species occurs on the coarse sedges of both the fresh-water and salt marsh. It was first described from specimens taken at the margin of the salt marsh in Virginia and from the Gulf Coast of Mississippi, also from specimens taken in the heart of the Florida everglades. In Illinois it occurs in the marsh habitat of the Chicago area.

**Illinois Records.**—OAK LAWN: in lamp globe, Aug. 22, 1934, DeLong & Ross, 1 ♀; Sept. 6, 1935, T. H. Frison, 2 ♂, 4 ♀. OQUAWKA: July 30, 1936, Mohr & Burks, 1 ♀. SUMMIT: Aug. 21, 1935, DeLong & Ross, 1 ♀. WAUKEGAN: Aug. 5, 1935, Ross & DeLong, 1 ♀.

5. *Chlorotettix tergatus* (Fitch)

*Bythoscopus tergatus* Fitch (1851, p. 58).

Length 7 mm. Large, sordid green, round headed, without definite color markings. Pronotum and scutellum often washed with yellowish green. Elytra usually smoky. Vertex slightly longer at middle than next to eyes, a little more than twice as wide as long.

Female seventh sternite, fig. 460*F*, twice as long as preceding, posterior margin with a broad V-shaped notch extending half way to the base, lateral lobes rounded. Male

plates, fig. 438, large, broad, covering pygofer, apex broad, obtuse. Aedeagus in lateral view broad at middle, with a slender anteriorly and dorsally directed anterior third; posterior third narrowed, curving dorsally; apex with a transverse portion bearing a pair of divergent, spinelike processes on its outer margins, each process sinuate.

This is a common northern swamp and bog species, and so far is not known to occur in any of the southern states. It is found in the tall coarse grass and sedge association in swampy areas or at the margins of tamarack-sphagnum bogs.

**Illinois Records.**—Many males and females, taken June 27 to October 6, are from Algonquin, Alton, Antioch, Beach, Cedar, Dixon Springs, Dolson, Golconda, Grafton, Grand Detour, Herod, Jonesboro, Kansas, Karnak, McHenry, Monticello, Normal, Oak Lawn, Olive Branch, Palos Park, Princeton, Quincy, Urbana, Vienna, Volo, and Waukegan.

#### 6. *Chlorotettix melanotus* DeLong

*Chlorotettix tergatus* var. *melanotus* DeLong (1916, p. 84).

Length 7.5 mm. Dark green, resembling *tergatus* so closely in coloration and structural characters that the two can scarcely be distinguished by external characters. Usually *melanotus* is darker in color. Male genitalia, fig. 439, and female seventh sternite very similar to those of *tergatus*. Aedeagus with an enlarged basal portion from which arises a short anterior process directed dorsally; a posterior process of about the same length extends dorsally and is bifurcate at apex, with a curved slender portion arising on the outside of each bifurcate piece near its apex. Each pygofer spine arises ventrally as in *tergatus* but is much smaller; curved, and not sinuate as in that species.

The habitat and distribution pattern of this species are entirely different from those of *tergatus*. This species occurs abundantly in wet pastures and meadows and is sometimes a hillside species in the southern states or southern portions of states just north of the Ohio River.

**Illinois Records.**—DOLSON: July 24, 1936, DeLong & Mohr, 2 ♀. KARNAK: July 10, 1935, DeLong & Ross, 2 ♀.

#### 7. *Chlorotettix suturalis* DeLong

*Chlorotettix suturalis* DeLong (1916, p. 85).

Length 7.5 mm. Pale green or yellowish, with a median brown line, sometimes only faintly visible, extending along commissural line of each elytron. Vertex bluntly angled. Posterior margin of female seventh sternite, fig. 460B, broadly, deeply notched more than half way to base, the sides dark brown. Male plates, fig. 442, broad and long, convexly narrowed to rounded tips. Aedeagus in lateral view with a long dorsally directed bifid process, each portion of which is bifurcate. Each pygofer with caudal margin almost truncate, obliquely sloping to slightly produced dorsal margin. Styles notched on outer margins near apex, forming curved finger-like apices arising on inner margins and curved outwardly.

This is one of the more common species, occurring in thickets of the cane, *Arundinaria tecta*, which is commonly found in the moist stream floodplains of the southern fourth of the state. Field studies have indicated that it is restricted to this plant host and does not normally occur upon other vegetation. This species was previously reported only from Tennessee.

**Illinois Records.**—HEROD: Aug. 4, 1934, DeLong & Mohr, 2 ♂, 4 ♀; July 8-11, 1935, DeLong & Ross, 2 ♂; June 24, 1936, DeLong & Ross, 1 ♂, 3 ♀. JONESBORO: July 31, 1934, DeLong & Mohr, 1 ♀. JUSTICE: July 23, 1937, Mohr & Burks, 2 ♀. NORRIS CITY: June 17, 1934, DeLong & Ross, 1 ♀. OQUAWKA: July 3, 1934, DeLong & Ross, 1 ♀. PRINCETON: June 28, 1937, Ross & Burks, 2 ♂. THEBES: July 11, 1935, DeLong & Ross, 5 ♂, 4 ♀. VIENNA: June 14, 1934, DeLong & Ross, 1 ♂, 3 ♀; July 29, 1934, DeLong & Ross, 1 ♂, 2 ♀; on cane, July 10, 1935, DeLong & Ross, 2 ♂, 3 ♀.

#### 8. *Chlorotettix limosus* DeLong & Cartwright

*Chlorotettix limosus* DeLong & Cartwright (1926, p. 506).

Length 7-8 mm. Broad headed, yellowish green. Posterior margin of seventh sternite of female excavated half way to base on either side of a prominent spatulate process, the latter cleft at apex, cleft extending half the distance of the excavation. Male plates, fig. 441, rather long, convexly rounded two-

thirds their length, then concavely rounded to blunt rounded apices. Aedeagus with two bifurcate terminal processes forming four long straight slender processes. Each pygofer with a long dorsal produced lobe, caudal margin slightly concave. Each style long, apical half slender, produced beyond lateral margin of plate near its apex.

Recorded previously only from Pennsylvania, this species occurs in the fresh-water marsh on coarse grasses in a mixed association of grasses and sedges. It can easily be distinguished by the long slender styles and by the four long terminal processes of the aedeagus.

**Illinois Records.**—DIXON SPRINGS: July 9, 1935, DeLong & Ross, 1 ♀; June 24, 1936, DeLong & Ross, 1 ♂. KARNAK: Aug. 8, 1934, DeLong & Mohr, 8 ♂, 10 ♀; July 10, 1935, DeLong & Ross, 3 ♂, 4 ♀. SHAWNEETOWN: June 14, 1934, DeLong & Ross, 1 ♀; June 23-27, 1936, DeLong, Ross, & Mohr, 2 ♂, 11 ♀. TEMPLE HILL: June 24, 1936, DeLong & Ross, 1 ♂, 1 ♀. WATSON: Oct. 1, 1934, Frison & Ross, 1 ♀. WOLF LAKE: July 30, 1934, DeLong & Mohr, 2 ♀.

### 9. *Chlorotettix spatulatus* Osborn & Ball

*Chlorotettix spatulatus* Osborn & Ball (1897, p. 225).

Length 7 mm. Greenish yellow, broad headed, female seventh sternite with spatulate process. Posterior margin of female seventh sternite, fig. 459C, broadly notched more than half way to base, apex of notch bearing a spatulate process that extends two-thirds the length of the notch. Male plates, fig. 443, broad at bases, acutely pointed. Aedeagus with a pair of bifurcate processes arising at apex, each of these with a long inner branch curved inwardly and an outer shorter branch arising some distance from apex of aedeagus body; short branch curves laterally and is broadened at middle. Each pygofer sloping on caudal margin from curved ventral to produced angled dorsal margin.

A common species of the northern Illinois fresh-water marsh and wet meadow, this species is also frequently found in moist areas of the prairie. It occurs in Florida and is widely distributed in the Middle West.

**Illinois Records.**—Many males and females, taken June 13 to September 30, are

from Albion, Algonquin, Beach, Cache, Clayton, Des Plaines, Evergreen Park, Fulton, Meredosia, Oak Lawn, Princeton, Rising Sun, St. Anne, Summit, Thomson, Urbana, Waukegan, and Zion.

### 10. *Chlorotettix obsenus* DeLong

*Chlorotettix obsenus* DeLong (1937c, p. 52).

Length 7-8 mm. Pale green, with broadly rounded head. Vertex not quite three times as wide between eyes as median length, produced at middle about two-thirds its length before anterior margins of the eyes. Female seventh sternite with lateral margins produced about two-thirds their length, then gradually and obliquely sloping to form produced lobes, between which the margin is excavated about one-third the distance to base; posterior margin gently sloping to the central fourth, which is more abruptly and almost concavely notched; base of the broad V-shaped notch brownish. Male plates, fig. 444, triangular, about as long as combined basal width, greatly exceeded by pygofers. Aedeagus, in ventral view, constricted at about two-thirds its length, then bifurcate, forming two slender terminal processes, which are not more than half as long as the basal portion.

Described from Illinois, this is a marsh species occurring on coarse grasses in grass-sedge habitats.

**Illinois Records.**—ST. ANNE: July 20, 1934, DeLong & Ross, 1 ♂. ZION: July 6, 1932, Frison *et al.*, 1 ♀; July 25, 1934, Frison & DeLong, 3 ♂, 3 ♀.

### 11. *Chlorotettix brevidus* DeLong

*Chlorotettix brevidus* DeLong (1937c, p. 52).

Length 6.5-7.0 mm. Bright green, tinged with yellow, and with a broadly rounded vertex, which is three times as wide between eyes as length at middle. Female seventh sternite with posterior margin shallowly concave between a pair of broad slightly produced lobes; between the inner pair the segment is deeply notched more than one-third the distance to the base; sides of the V-shaped notch are straight and the apex brownish. Male plates, fig. 445, triangular, sharply angled at apexes. Ventral margins of ninth sternite not overlapping but forming a keel, which is conspicuous caudad of the plates. Also the caudal notch in the

pygofer near the posterior margin is shorter and more sharply notched at base than in *unicolor*. Aedeagus is the same form and type as in *unicolor*, but the terminal processes are proportionately shorter, in every case being conspicuously shorter than the basal portion of the aedeagus.

This species occurs on grasses of the sand prairie. It is known only from Illinois.

**Illinois Records.**—OAK LAWN: sand prairie, July 27, 1934, 1 ♀. THOMSON: sand prairie, July 8, 1934, DeLong & Ross, 3 ♂, 6 ♀. ZION: July 25, 1934, Frison & Lee, 1 ♂.

## 12. *Chlorotettix unicolor* (Fitch)

*Bythoscopus unicolor* Fitch (1851, p. 58).

*Chlorotettix wanduzei* Baker (1898d, p. 219).

Length 7.5 mm. Green or yellowish, broad headed. Posterior margin of female seventh sternite, fig. 460M, broadly, shallowly notched, narrowed and sharp at apex. Male plates, fig. 446, broad at base, outer margins of each concave on apical half, apexes produced and divergent. Pygofers deeply notched on caudal margins. A pair of very short processes at end of body of aedeagus; also a pair of long processes arising and extending laterally, these processes as long as ventral portion of aedeagus body. Each style short, broad at base, notched on outer margin near apex.

This is a large and common species in the northern United States, occurring in the fresh-water marsh and in coarse meadow grasses.

**Illinois Records.**—Many males and females, taken June 2 to August 24, are from Apple River Canyon State Park, Beach, Carman, Des Plaines, Evergreen Park, Fox Lake, Fulton, Grand Detour, Harvard, Palos Park, Princeton, St. Anne, Summit, Volo, Wauconda, Waukegan, and Zion.

## 13. *Chlorotettix viridius* Van Duzee

*Chlorotettix viridius* Van Duzee (1892d, p. 309).

Length 6–7 mm. Round headed, apple green. Posterior margin of female seventh sternite, fig. 460G, broadly excavated almost to base, the sides of incisure interrupted at middle by a short obtuse blackish tooth. Male plates, fig. 447, nearly rectangular, transverse, a little longer than valve, apexes of plates slightly produced and divergent.

Aedeagus in lateral view constricted near apex, forming a dorsally directed finger-like apex that appears bifid in caudal view. Each style short, broad at base, slightly narrowed between base and apex, which is again broadened and almost truncate. Pygofers with long spines arising ventrally and extending dorsally and caudally.

This is a common species of meadows, pastures, and grassy areas in the eastern and southern states and occurs abundantly in portions of Illinois.

**Illinois Records.**—Many males and females, taken March 11 to October 2, are from Adair, Albion, America, Beardstown, Bloomington, Carbondale, Carman, Cave in Rock, Centralia, Dongola, Dubois, DuQuoin, Edgewood, Eichorn, Elizabethtown, Evergreen Park, Fairfield, Fern Cliff, Fulton, Geff, Golconda, Grafton, Harrisburg, Havana, Herod, Homer, Kampsville, Karnak, Lawrenceville, Macomb, Marshall, Metropolis, Mount Carmel, Oquawka, St. Anne, Shawneetown, Thebes, Urbana, Vienna, Watson, and York.

## 14. *Chlorotettix lusorius* (Osborn & Ball)

*Thamnotettix lusoria* Osborn & Ball (1897, p. 226).

Length 7–8 mm. Olive brown, with a faint crescentiform band before the eyes; vertex produced, twice as wide as long. Elytra with a dull reddish tinge. Posterior margin of female seventh sternite, fig. 460H, emarginate, with a broad angularly pointed dark margined median tooth half as long as the acutely rounded lateral angles. Male plates, fig. 448, one-half longer than broad at bases, outer margins thickened, apexes bluntly pointed and strongly divergent. Aedeagus with a short lateral process extending laterally on either side at apex. Styles short, each broad at base and triangular, with a short V-shaped notch on outer margin of each near apex. Each pygofer a little longer on ventral than on dorsal margin, two spines arising on ventral half.

This species is usually found in the herbaceous growth of open woodland areas in the northern United States and Canada. It has been taken frequently in Illinois in habitats of this type.

**Illinois Records.**—Males and females, taken June 11 to October 2, are from Apple River Canyon State Park, Dolson, Herod,

Hopedale, Marshall, Monticello, Muncie, Oakwood, Temple Hill, Urbana, and White Heath.

#### 15. *Chlorotettix iridescens* DeLong

*Chlorotettix iridescens* DeLong (1916, pp. 83, 86).

Length 7 mm. Bronze or brownish, tinged with green, appearing iridescent. Vertex one-third longer at middle than next to eyes, more than twice as wide as long. Female seventh sternite, fig. 460D, broadly, deeply excavated to base, sides of excavation concave, convex near apex, forming long rather sharply rounded lateral angles. Male plates, fig. 450, broad and rather short, convexly rounded, with bluntly angled apexes. Styles long, apexes bluntly angled, each broadly and concavely notched on outer margin about one-third the distance from apex. Aedeagus in lateral view with a dorsal anterior process, body curving ventrally and caudally, apex bifid. Each pygofers concave on caudal margin; spines arising on ventrocaudal margin and hooked at the apexes.

This species occurs in abundance in the floodplain woods on grasses in a mixed habitat of grasses, cane, violets, and similar plants of the wet soils of this habitat. It was previously recorded from Maryland and Tennessee.

**Illinois Records.**—BEARDSTOWN: Sept. 1, 1939, Ross & Riegel, 2♂, 1♀. DIXON SPRINGS: July 29, 1934, DeLong & Ross, 1♂, 3♀. HEROD: Aug. 4, 1934, DeLong & Ross, 30♂, 36♀.

#### 16. *Chlorotettix attenuatus* Brown

*Chlorotettix attenuatus* Brown (1933, p. 241).

Length 6.75–7.0 mm. Yellowish green, with dark eyes. Vertex bluntly angled, one-half longer at middle than next to eyes. Female seventh sternite, fig. 459A, with posterior margin excavated to about one-half the length of the segment and bearing a short spatulate process, which is about as wide as long. Male plates, fig. 451, broad at bases, slightly narrowed to long acute apexes, which about equal the pygofers. Each style long and abruptly narrowed at about middle, apical third spinelike and curved outwardly. Aedeagus long in lateral view, with an anterior dorsally curved broadened portion; apex with a pair of short

dorsally curved processes, and a pair of long processes extending dorsally and broadly curved with pointed apices directed ventrally; in ventral view with a pair of lateral outwardly directed spines, from near the base of which a long tapering process arises each side of middle and extends anteriorly, with a recurved apex.

Described from Missouri, this species is now recorded from Illinois.

**Illinois Records.**—DIXON SPRINGS: June 24, 1936, DeLong & Ross, 1♂. KARNAK: July 10, 1935, DeLong & Ross, 2♀. SHAWNEETOWN: June 23, 1936, DeLong & Ross, 8♂, 25♀.

#### 17. *Chlorotettix balli* Osborn

*Chlorotettix balli* Osborn (1898, p. 246).

Length 7.0–7.25 mm. Yellowish green. Vertex angularly produced, one-half longer at middle than next to eyes. Female seventh sternite, fig. 460E, with a deep notch extending almost to the base and including a spatulate process; sides of process straight, lateral margins angled. Male plates, fig. 452, gradually narrowed to acute apices. Aedeagus with a pair of bifurcate processes at apex. Each style broad at base, concavely narrowed to straight finger-like process. Pygofers slightly concave on posterior margins, angled with dorsal margins.

Recorded previously from Tennessee, Ohio, and Iowa, this is a rather common species in open woodland or flat marshy meadow on thick luxuriant growths of mixed grasses.

**Illinois Records.**—Many males and females, taken June 5 to August 22, are from Alton, Apple River Canyon State Park, Cave in Rock, Dixon Springs, Dolson, Elizabethtown, Farina, Galena, Golconda, Hardin, Herod, Justice, Kankakee, Metropolis, Monticello, Norris City, Oakwood, Pike, Rock Island, Shawneetown, Temple Hill, Urbana, Vienna, and White Pines Forest State Park.

#### 18. *Chlorotettix filamentus* DeLong

*Chlorotettix filamentus* DeLong (1937c, p. 53).

Length 7 mm. Green, tinged with yellow, and with produced bluntly angled vertex, which is twice as wide between eyes as median length. Each male plate, fig. 449, triangular, outer margin convexly rounded at base, then concavely rounded before

apex, which is narrow but bluntly rounded; combined width at base a little greater than length. Aedeagus similar in type to that of *balli* but differing by having the inner branch of each bifurcate process at the apex at least twice as long as the corresponding branch in *balli*, and the outer branch is at least four times as long as the corresponding process in *balli*. Female unknown.

Described from Illinois, this species is known by only three male specimens.

**Illinois Records.**—HAVANA: Aug. 30, 1917, 1 ♂. MARSHALL: Sept. 27, 1934, Frison & Ross, 2 ♂.

### 19. *Chlorotettix dentatus* Sanders & DeLong

*Chlorotettix dentatus* Sanders & DeLong (1923, p. 154).

Length 8 mm. Yellow to green, with a roundedly produced vertex, which is twice as wide as long and almost one-half longer at middle than next to eyes. Posterior margin of female seventh sternite, fig. 459B, notched on either side of a pair of rounded slightly produced median teeth on the median fourth; sternite convex ventrally, almost keeled. Male plates, fig. 454, convexly rounded to half their length, then rather abruptly constricted and produced as narrow parallel tips with blunt apices.

Previously recorded from the District of Columbia and Maryland, this species has been taken in Illinois and is found in marshy meadow habitats.

**Illinois Records.**—KARNAK: Aug. 8, 1934, DeLong & Mohr, 4 ♀; July 10, 1935, DeLong & Ross, 1 ♂.

### 20. *Chlorotettix galbanatus* Van Duzee

*Chlorotettix galbanatus* Van Duzee (1892d, p. 310).

Length 6.0–6.5 mm. Yellowish green in color, with an obtusely angled vertex, which is one and one-half times as long at middle as next to eyes. Female seventh sternite, fig. 460C, with a rather broad notch reaching two-thirds the distance to base; lobes on posterior margin laterad of the notch broadly rounded or slightly angled at middle. Male plates, fig. 453, evenly, convexly rounded from bases to apices, inner margins at apices depressed, apices obtusely angled. Aedeagus in lateral view broad at base,

narrowed about middle and produced as a long narrow portion with a pair of processes at apex. Each style broad, rather short, abruptly narrowed on outer margin near apex, forming a curved finger-like process.

This is probably the most common species of the genus, occurring throughout Illinois in pastures and meadows on many types of grasses. It is found in the eastern states and west to Montana.

**Illinois Records.**—Many males and females, taken June 3 to October 11, are from Algonquin, Alton, Alto Pass, Amboy, Anna, Apple River Canyon State Park, Ashley, Brownfield, Cairo, Carbondale, Carmi, Castle Rock, Champaign, Cobden, Danville, Dixon Springs, Dolson, Dongola, Dubois, Duncans Mills, Eichorn, Elizabethtown, Fairfield, Fern Cliff, Fulton, Galena, Gibsonia, Golconda, Grafton, Grand Detour, Grand Tower, Hardin, Havana, Herod, High Knob, Justice, Jonesboro, Kampsville, Kankakee, Karnak, Lima, Marshall, Meredosia, Metropolis, Monticello, Mount Carmel, Muncie, New Holland, Norris City, Oak Lawn, Oakwood, Olive Barnch, Oquawka, Pike, Princeton, Quincy, Ripley, Rock Island, St. Anne, St. Joseph, Savanna, Shawneetown, Spring Valley, Starved Rock State Park, Sumner, Sun Lake, Temple Hill, Urbana, Ursa, Vandalia, Vienna, Villa Ridge, Warren, Watson, White Heath, White Pines Forest State Park, and Wolf Lake.

### 21. *Chlorotettix borealis* Sanders & DeLong

*Chlorotettix borealis* Sanders & DeLong (1917, p. 92).

Length 6.0–6.5 mm. Greenish yellow, with dark eyes. Vertex obtusely angled, one-half longer at middle than next to eyes. Female seventh sternite, fig. 459D, with posterior margin truncate and with a narrow median V-shaped notch extending half way to base. Male plates, fig. 455, broad at bases, convexly rounded to obtusely angled apices. Aedeagus in lateral view with small upturned process at apex. Styles long, gradually narrowed to attenuated apices. Pygofers each with a long spine on dorsal side separated by a deep notch, and a long spine on ventral margin extending dorsally.

In Illinois this species has been taken on fine grasses in sandy areas in open wood-

land. It was previously recorded from Wisconsin.

**Illinois Records.**—Males and females, taken July 8 to October 2, are from Cave in Rock, Dixon Springs, Dolson, Elizabethtown, Grand Detour, Oregon, St. Anne, Springfield, and Vienna.

## 22. *Chlorotettix nudatus* Ball

*Chlorotettix nudata* Ball (1900c, p. 340).

Length 7.5 mm. Green, with a brownish or smoky tint. Vertex twice as long as middle as next to eyes, slightly, conically pointed. Female seventh sternite, fig. 460K, with posterior margin distinctly darker marked and divided into four lobes by a narrow slit in the middle and a pair of broad shallow notches a little more than half way toward the sides. Male plates, fig. 456, broad at bases, convexly and then concavely narrowed to acutely pointed apexes. Pygofer sloping ventrally and dorsally to bluntly pointed apexes. Styles long, tapered, bent inwardly one-third the distance from apexes. Aedeagus bifid at apex.

Recorded previously from Tennessee and Iowa, this species occurs in abundance on grasses in the floodplain woods. It seems to be confined almost entirely to moist woodland areas that support a rich growth of grasses.

**Illinois Records.**—Males and females, taken June 24 to October 3, are from Danville, Dixon Springs, Dolson, Elmira, Herod, High Knob, Kankakee, Oakwood, Pike, Temple Hill, Urbana, Vienna, and White Heath.

## 23. *Chlorotettix vacunus* Crumb

*Chlorotettix vacuna* Crumb (1915, p. 196).

Length 6.0–6.5 mm. Yellowish, tinged with green; vertex bluntly angled, one-half broader than long and one-third longer at middle than next to eyes.

Female seventh sternite, fig. 460I, with posterior margin broadly, somewhat convexly excavated three-fourths the distance to base, lateral lobes bluntly angled. Male plates, fig. 458, broad at bases, outer margins convexly narrowed to near apexes, where they are slightly concave to form acute tips. Aedeagus in lateral view narrow at base, broadened at apex, and deeply notched. Styles long and narrow, gradually narrowed from bases to apexes. Each pygo-

fer pointed at apex with a long dorsal spine.

This is a grass species occurring in southern areas of Illinois. It was recorded previously from Tennessee, and does not occur in abundance.

**Illinois Records.**—Males and females, taken June 12 to August 14, are from Dixon Springs, Eichorn, Elizabethtown, Fairfield, Herod, Jonesboro, Karnak, La Rue, and Vienna.

## 24. *Chlorotettix tunicatus* Ball

*Chlorotettix tunicata* Ball (1900c, p. 340).

Length 7 mm. Pale yellowish green, with greenish elytra. Vertex produced, one-half longer at middle than next to eyes, twice as wide as long.

Female seventh sternite, fig. 460L, with posterior margin roundedly emarginate one-third the depth of the segment, sometimes slightly notched at middle but always appearing notched because of a brown V-shaped spot at middle of emargination. Male plates, fig. 457, broad at base, roundedly narrowed to a very obtuse, almost truncate apex, plates together the shape of a bluntly pointed spoon. Each pygofer concave on caudoventral margin, with a long straight spine arising in middle of concavity and directed caudally. Aedeagus in lateral view broad at base, apical two-thirds narrow, notched at apex, forming an anteriorly directed short finger-like process. Styles broad at bases, triangular, apexes bluntly pointed.

This species occurs on grasses in open woodland areas in the eastern and southern states.

**Illinois Records.**—Many males and females, taken June 14 to October 8, are from Alton, Amboy, Anvil Rock, Apple River Canyon State Park, Cave in Rock, Dixon, Dolson, Fulton, Havana, Kankakee, Metropolis, Pike, St. Anne, Shawneetown, Temple Hill, Urbana, Vienna, and White Heath.

## 25. *Chlorotettix distinctus* DeLong

*Chlorotettix distinctus* DeLong (1919, p. 23).

Length 6 mm. Yellow, tinged with green. Vertex bluntly angulate, almost one-half longer at middle than next to eyes. Female seventh sternite, fig. 460J, with posterior margin deeply and broadly notched two-thirds the distance to base; sides of apical

half straight, basal half with sides concavely rounded to form a bluntly angled lobe on either side.

Described from Tennessee, this species is known only from the female. In Illinois, it occurs only in the southern part of the state.

**Illinois Records.**—VIENNA: July 29, 1934, DeLong & Ross, 1 ♀. VOLO: July 27, 1934, DeLong & Ross, 1 ♀.

### 93. *DOLERANUS* Ball

*Doleranus* Ball (1936, p. 58).

Head conical, venation simple but with central anteapical cell somewhat constricted, then enlarged before the apex. Vertex with a broken submarginal brown line. Three species are included in this genus, two of which are eastern and occur in Illinois.

#### KEY TO SPECIES

Green in color, without definite markings. . . . . 2. *vividus*  
Brownish yellow, marked with reddish brown . . . . . 1. *longulus*

#### 1. *Doleranus longulus* (Gillette & Baker)

*Thamnotettix longulus* Gillette & Baker (1895, p. 97).

Length 5–6 mm. Brownish yellow, marked with reddish brown. Vertex obtusely angled, twice as wide as long; light fulvous, ocelli white, connected by a white transverse line; median longitudinal line and spot either side at base brown. Pronotum fulvous, marked with dark brown on anterior portion. Scutellum fulvous, disc paler. Elytra chestnut, nervures pale. Female seventh sternite with posterior margin depressed, slightly, angularly elevated. Male plates concavely rounded to the almost parallel-margined tips.

Common on herbaceous plants in open wooded areas, on wooded floodplains, and along stream banks, this species occurs in the eastern states and west to Iowa, Kansas, and Colorado.

**Illinois Records.**—Many males and females, taken March 27 to November 1, are from Aldridge, Carmi, Cave in Rock, Champaign, Charleston, Cobden, Dongola, Eichorn, Fountain Bluff, Grand Tower, Karnak, La Rue, Marshall, Monticello, Normal, Rock Island, Savoy, Urbana, Vienna, and White Heath.

### 2. *Doleranus vividus* (Crumb)

*Chlorotettix vivida* Crumb (1915, p. 197).

Length 5.5–6.0 mm. A distinctly angle-headed greenish species tinged with brown. Vertex one and one-half times as broad as long, almost twice as long at middle as next to eyes. Female seventh sternite with posterior margin broadly, triangularly notched half way to base, with a tooth at apex. Male plates, fig. 247, rather long, gradually narrowed three-fourths their length, then produced with almost parallel margins. Pygofers truncate posteriorly. Aedeagus in lateral view broad at base, narrowed to tapered bifurcate apex. Styles rather short, abruptly narrowed to finger-like apices.

A common species on grassy areas in meadows along streams, in valleys, and in open woodland, *vividus* occurs in the middle western and eastern states.

**Illinois Records.**—Many males and females, taken June 7 to November, are from Algonquin, Alton, Apple River Canyon State Park, Cave in Rock, Champaign, Danville, Dixon Springs, Dolson, Dubois, Elizabethtown, Fern Cliff, Golconda, Grafton, Havana, Herod, Jonesboro, Kampsville, Kankakee, Karnak, Lima, Monmouth, Monticello, Mount Carmel, Muncie, Normal, Oakwood, Olive Branch, Oquawka, Parker, Pike, Quincy, Rock Island, Thebes, Urbana, Ursa, Vienna, and White Pines Forest State Park.

### 94. *ATANUS* Oman

*Atanus* Oman (1937, p. 381).

Fig. 207. Vertex nearly flat, longer at middle than next to eyes, and bluntly angled. Head a little wider than pronotum. Forewing with simple venation, the second cross-vein lacking. The outer anteapical cell is short, with almost parallel sides, and is more slender than inner anteapical cell.

Only one of the two United States species belonging to this genus is known to occur in Illinois.

#### 1. *Atanus perspicillatus* (Osborn & Ball)

*Thamnotettix perspicillatus* Osborn & Ball (1897, p. 227).

Length 3.5–4.0 mm. A small gray species marked with black spots. Vertex creamy white, tinged with orange, two faint black



lines extending from apex to ocelli, basal half with a large fulvous crescent either side enclosing a white area. Pronotum gray; with broad faint longitudinal bands and a pair of spots behind each eye black. Scutellum pale, basal angles orange. Elytra milky, subhyaline, iridescent, with nine black spots. Vertex slightly longer at middle than next to eyes, a little wider at base than median length. Female seventh sternite broadly, angularly produced. Male valve short and broad; plates long, apices produced into pointed acute tips; a median black spot on each plate at base.

Occurring on herbaceous growth in wooded areas along streams, and in rich herbaceous areas, this species is distributed in parts of the East and Middle West.

**Illinois Records.**—DARWIN: July 23, 1932, Dozier & Park, 1♂. DIXON SPRINGS: July 9, 1935, DeLong & Ross, 1♂, 1♀. DOLSON: Rocky Branch, July 18, 1934, DeLong & Ross, 3♂; July 24, 1936, DeLong & Mohr, 3♀. HEROD: June 24, 1936, DeLong & Ross, 1♂. MOUNT CARMEL: July 3, 1906, 1♀. URBANA: sweeping, July 28, 1889, C. A. Hart, 1♂, 4♀; Aug. 27, 1916, 3♂, 5♀; Aug. 16–20, 1934, 3♂, 1♀. VIENNA: savanna grasses, June 14, 1934, DeLong & Ross, 1♂; July 29, 1934, DeLong & Ross, 1♂, 1♀.

95. *ELYMANA* DeLong

*Elymana* DeLong (1936a, p. 218).

This genus includes the more pointed-headed species previously included in *Thamnotettix*. Form usually long and slender, vertex sharply pointed or strongly and bluntly produced and acutely angled with front. Elytra long and narrow, venation as in *Thamnotettix*. Last sternite of male long, tapering to a pointed spinelike process. Aedeagus long, tapering to a long slender dorsally directed process. Base of aedeagus with dorsally extending process of various shapes.

DeLong (1936b) recorded five species of this genus for North America. One is known only from Arizona; the other four are eastern in distribution and all occur in Illinois, usually in wooded areas on *Elymus* and related grasses.

The species of the genus are closely related, and the females are very similar in the character of the seventh sternite, the posterior margin of which is usually sinuate.

KEY TO SPECIES

1. Ninth segment of male produced into a sharp-pointed spine at apex. Spines on median dorsal portion visible in lateral view, directed caudad, as in figs. 461B, 461C. 2
- Ninth segment of male tapered, but blunt at apex, apical spines above apex of segment. Median dorsal spines not visible in lateral view, directed laterally into genital chamber, as in figs. 461A, 461D. 3
2. Styles of male, fig. 461B, constricted between bases and enlarged apices, which are sharp pointed on outer margins and slope outwardly.

1. *acrita*

Styles, fig. 461C, constricted near bases and slightly tapered to almost truncate apices, which are not enlarged

2. *acuma*

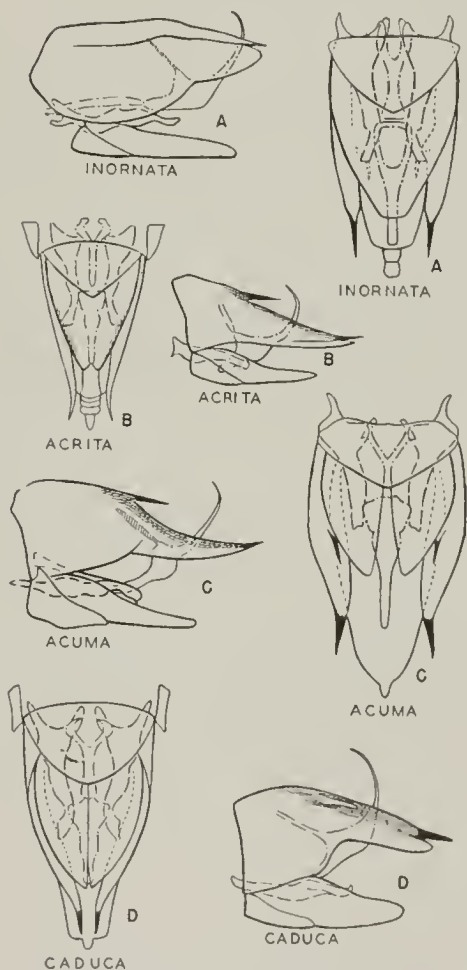


Fig. 461.—*Elymana*. A–D, male genitalia, ventral and lateral aspects.

3. Vertex almost rounded at apex, three-fifths as long as wide. Styles of male, fig. 461D, constricted near apexes, then strongly curved outwardly, enlarged, and truncate on outer margins.....**3. *caduca***  
 Vertex more angled, three-fourths as long as wide. Styles, fig. 461A, constricted near apexes but not enlarged, produced as parallel-sided apexes directed slightly obliquely and truncate at apex.....**4. *inornata***

#### 1. *Elymana acrita* DeLong

*Elymana acrita* DeLong (1936b, p. 637).

Length 4.75–5.0 mm. Yellowish, with black ocelli, vertex sharply angled, almost as long as basal width between eyes. Female seventh sternite shallowly and roundedly emarginate, with a dark spot on either side of middle. Male ninth segment, fig. 461B, sloping to posterior spine, scarcely concave, anterior spine prominent. Styles in ventral view with outer margins sinuate and each tapered to a constricted portion anterior to an enlarged apical process, truncate at apex.

This species was described from Illinois, where it is abundant on *Elymus* grasses in shaded areas, on floodplains, and similar moist soils. It can easily be distinguished from the other members of the genus by characters of the male styles.

**Illinois Records.**—DIXON SPRINGS: July 9, 1935, DeLong & Ross, 1 ♀. ELIZABETHTOWN: June 25, 1932, Ross, Dozier, & Park, 1 ♂. GOLCONDA: June 22, 1932, Ross, Dozier, & Park, 1 ♀. HEROD: June 23, 1936, DeLong & Ross, 1 ♂. MONTICELLO: June 11, 1934, 3 ♂, 7 ♀. OQUAWKA: June 13, 1932, H. L. Dozier, 1 ♀.

#### 2. *Elymana acuma* DeLong

*Elymana acuma* DeLong (1936b, p. 637).

Length 5 mm. Yellowish and with black ocelli, slightly larger than *acrita*. Vertex rather sharply angled, only slightly wider between eyes than length at middle. Female seventh sternite truncate, with heavy brown spots on either side of middle. Male ninth segment, fig. 461C, with anterior spine prominent in lateral view, the dorsal margin beyond this strongly and concavely rounded to form the posterior spine. Styles in ventral view rather short, not notched on outer margins, slightly and convexly rounded on inner margins; sides almost parallel, apexes truncate.

This is a southern species, described from Tennessee, and is found on *Elymus* grasses in shady wooded areas.

**Illinois Records.**—DIXON SPRINGS: July 9, 1935, DeLong & Ross, 1 ♀. ELIZABETHTOWN: June 25, 1932, Ross, Dozier, & Park, 1 ♂. GOLCONDA: June 22, 1932, Ross, Dozier, & Park, 1 ♀. HEROD: June 24, 1936, DeLong & Ross, 1 ♂. OQUAWKA: June 13, 1932, Dozier, 1 ♀.

#### 3. *Elymana caduca* DeLong

*Elymana caduca* DeLong (1936b, p. 638).

Length 5 mm. Yellow, tinged with green; ocelli black; veins of elytra paler than disc and conspicuous. Vertex bluntly angled, three-fifths as long as basal width. Female seventh sternite truncate or slightly emarginate. Male ninth segment, fig. 461D, strongly convex and rounded dorsally, anterior spine hidden in lateral view, extending inwardly; posterior spine prominent. Styles in ventral view rather deeply notched on outer margins, inner margins strongly convex and curved, apexes turned outwardly, with pointed tips.

This is a common marsh species in northern Wisconsin and occurs at the margins of sphagnum bogs. It is found in similar habitats in northern Illinois.

**Illinois Records.**—BEACH: Aug. 7, 1935, DeLong & Ross, 1 ♀. VOLO: Aug. 24, 1935, DeLong & Ross, 6 ♀; Aug. 12, 1937, Burks & Ross, 1 ♀. WAUCONDA: July 23, 1934, DeLong & Ross, 1 ♀.

#### 4. *Elymana inornata* (Van Duzee)

*Thamnotettix inornatus* Van Duzee (1892c, p. 303).

Length 5.0–5.5 mm. Dull yellow, tinged with green, bluntly angled. Vertex one-fourth wider between eyes than length at middle. Female seventh sternite almost truncate, a brown spot on either side of middle, producing notched appearance. Dorsal portion of male ninth segment, fig. 461A, convexly rounded to posterior spine; anterior spine extending inwardly and not visible in lateral view. Styles long, outer margins sloping inwardly to near apexes, where they are notched, and the apexes produced as short rather narrow parallel-margined and divergent processes.

This species is chiefly northern in distribution, occurring commonly at the margin

of the fresh-water marsh or similar moist areas.

**Illinois Records.**—Males and females, taken June 11 to November 10, are from Apple River Canyon State Park, Cave in Rock, Danville, Dolson, Herod, Kankakee, Marshall, Monticello, Oakwood, Shawneetown, and Urbana.

96. *CICADULA* Zetterstedt

*Cicadula* Zetterstedt (1838, col. 296).  
*Cyperana* DeLong (1936a, p. 218).

Fig. 462. This genus includes the common green leafhoppers of the *Thamnotettix* type, which occur in fresh-water marshes on *Cyperus*, similar sedges, and coarse grasses; they are characterized by having a bluntly angled vertex, which is usually produced, but in some species the apex is almost rounded. The elytra are long and narrow, with venation as in *Thamnotettix*. In most species of this genus, individuals are some shade of green or yellow, with a black band or a row of black spots on the margin of the vertex between the eyes.

The greater number of species of the genus occur only in the eastern United States, but some occur as far west as the Rocky Mountains. A few of the species are found only in the western United States. DeLong (1937d) recorded 13 species for the United States under the generic name *Cyperana*, and nearly half of these occur in Illinois.

KEY TO SPECIES

1. Tawny or pale brown, longitudinally marked with brownish or reddish stripes; spots on vertex linear in form or forming a band, figs. 463A, 463B. . . . . 2
2. Yellow or green, without longitudinal stripes. . . . . 3

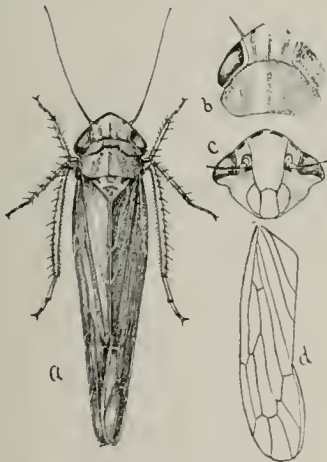
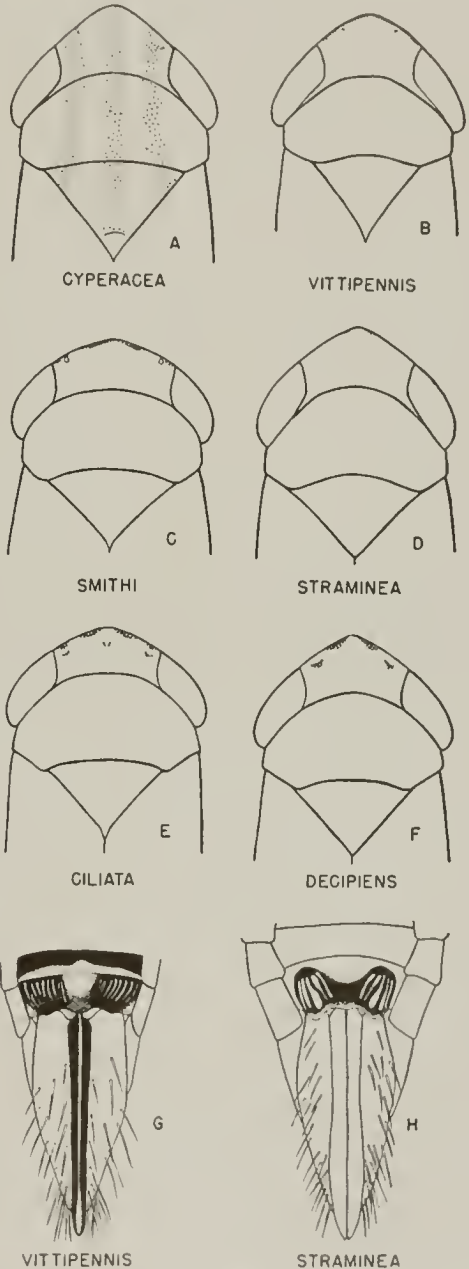


Fig. 462.—*Cicadula cyperacea*: a, adult; b, head and pronotum; c, face; d, elytron. (From Osborn.)

Fig. 463.—*Cicadula*. A-F, head and pronotum; G-H, female genitalia.

- 2. Vertex with four linear black spots on margin..... **1. cyperacea**  
Vertex with a black band on margin.....
- ..... **2. vittipennis**
- 3. Length 6.5-7.0 mm.; pale yellow, with a pair of large black spots at apex of vertex and a pair of smaller spots next to eyes..... **3. straminea**  
Length not over 6.0 mm.; usually green or yellowish green..... 4
- 4. Black coloration on margin of vertex forming band between eyes... **4. smithi**  
Black coloration on margin of vertex in the form of spots..... 5
- 5. Four black spots on margin of vertex but without markings posterior to ocelli... .. 6

- Markings on margin of vertex and also posterior to ocelli..... 7
- 6. Each male plate, fig. 464A, deeply and concavely excavated on inner margin of apical third; each style tapered from base to apex..... **5. melanogaster**  
Each male plate, fig. 464E, sloping on inner margin, not concavely rounded; each style with a pair of finger-like processes at apex, an inner long one and an outer short one..... **6. ciliata**
- 7. Length 3.5-4.5 mm.; aedeagus, fig. 464C, short, not greatly enlarged at base; occurring in the western United States..... **7. longiseta**

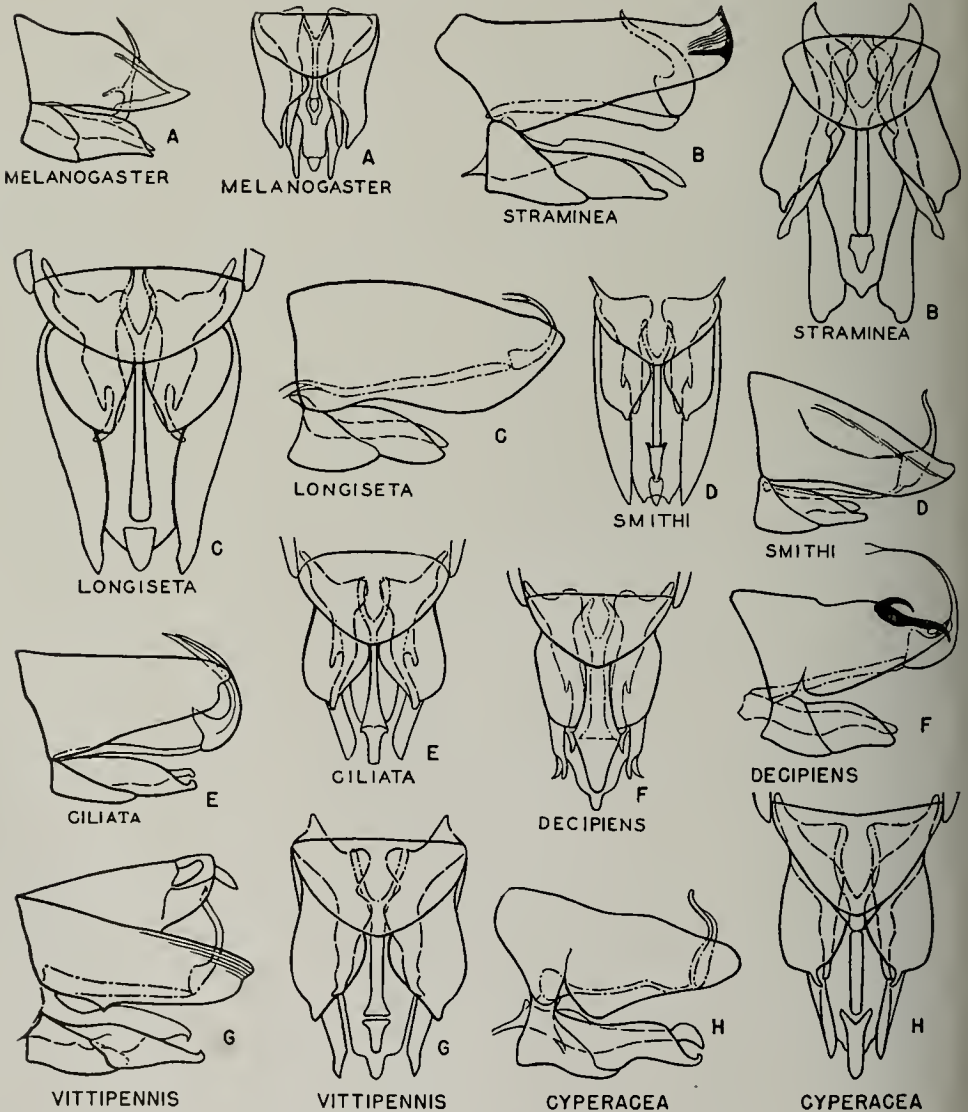


Fig. 464.—*Cicadula*. A-H, male genitalia, ventral and lateral aspects.

Length more than 4.5 mm.; aedeagus long, fig. 464F, large at base, apical two-thirds very slender; occurring in north-eastern United States. **8. decipiens**

### 1. *Cicadula cyperacea* (Osborn)

*Thamnotettix cyperaceus* Osborn (1898, p. 245).

Length 5.5–6.0 mm. Tawny, with orange or brownish longitudinal stripes and four black dashes on margin of vertex, fig. 463A, between the eyes. Vertex flat and bluntly angled, one-half wider between eyes at base than length at middle.

Female seventh sternite with lateral angles broadly rounded, posterior margin slightly, narrowly indented on either side of a broad median slightly produced tooth; median tooth about one-third width of sternite; a large round area on outer third of sternite composed of oblique ridges and striae. Male plates, fig. 464H, rather long and broad, each convexly rounded to blunt apex, where it bears a rather long incurved finger-like process. Each style long, broad on basal half, then rather rapidly narrowed to slender apical processes, which are produced half the length of style. Aedeagus rather small, slightly enlarged at base, apical portion narrowed, produced dorsally, and curved anteriorly.

This species is commonly found in the fresh-water marsh of the northern states in *Cyperus* habitats. It is a fairly common species in the marshes of northern Illinois, and closely resembles *vittipennis*, which is found in the same general type of habitat.

**Illinois Records.**—ANTIOCH: July 5–7, 1932, T. H. Frison, 1♂. FOX LAKE: June 30, 1935, DeLong & Ross, 4♂, 6♀. ORANGEVILLE: Aug. 28, 1934, Frison & DeLong, 1♂, 1 nymph. URBANA: June 2, 1890, C. A. Hart, 1♂. VOLO: July 16, 1935, DeLong & Ross, 3♂, 1♀; in bog, Aug. 24, 1935, DeLong & Ross, 2♂, 2♀.

### 2. *Cicadula vittipennis* (Sanders & DeLong)

*Thamnotettix vittipennis* Sanders & DeLong (1917, p. 91).

Length 5.5–6.0 mm. Tawny, with elytra appearing white striped. Vertex, fig. 463B, with a black marginal stripe between eyes, and a tawny band covering disc and extending to eyes. Vertex bluntly angled, twice as wide between eyes as length at

middle. Female seventh sternite, fig. 463G, with posterior margin slightly emarginate and narrowly notched on either side of middle; outer third striated as in *cyperacea*. Male plates, fig. 464G, short and broad, convexly rounded on each outer margin, and strongly sloping on inner margin to form a blunt toothlike structure at apex. Styles long, sinuately tapered from bases and curving outwardly to form blunt apices, pointed on outer margins. Plates decidedly longer than styles. Aedeagus slender, slightly enlarged at base, normally directed dorsally, curved slightly caudally at middle.

This species has been collected only in northern Wisconsin from the tall grass and sedge habitat of the fresh-water marsh.

### 3. *Cicadula straminea* (Sanders & DeLong)

*Thamnotettix stramineus* Sanders & DeLong (1917, p. 90).

Length 6.5–7.0 mm. Large, yellow, with four transverse black spots on margin of vertex, fig. 463D, the inner spots large, the outer two small. Vertex almost twice as broad as median length, bluntly angled. Female seventh sternite, fig. 463H, with outer angles forming broadly rounded lobes, between which the posterior margin is shallowly and concavely rounded; outer third of segment on either side black, with prominent oblique ridges and striae. Male plates, fig. 464B, short, each gradually narrowed on inner margin and convexly rounded on outer to form a prominent pointed projection at apex. Styles long and slender, tapering and slightly constricted just before bluntly pointed apices.

This species inhabits the sedges of the northern marsh areas and may occur in northern Illinois.

### 4. *Cicadula smithi* (Van Duzee)

*Thamnotettix smithi* Van Duzee (1892b, p. 266).

Length 5 mm. Green, tinged with yellow, and with a broad black band on margin of vertex, fig. 463C, between the eyes; vertex broadly rounded, almost parallel margined, twice as wide between eyes as length at middle; elytra green, apices smoky. Female seventh sternite with lateral angles broadly rounded, posterior margin slightly

emarginate on either side of a broad slightly produced median tooth, which is produced almost as far as the rounded lateral angles. Each male plate, fig. 464D, short, sides convexly rounded to blunt apex, with a short blunt toothlike projection. Each style rather long, narrowed at about one-third its length and produced to form a spurlike tooth on outer margin and an elongated rather broad finger-like process on inner margin, process blunt at apex. Aedeagus rather short, enlarged at base, narrowed at about half its length to form a slender apical process, which is directed dorsally.

A species occurring in the fresh-water marsh on *Spartina michauxiana*, *smithi* is recorded from the eastern states and the Middle West.

**Illinois Records.**—CHAMPAIGN: at light, June 12, 1888, 1 ♀. FOX LAKE: June 30, 1935, DeLong & Ross, 1 ♂; June 26, 1936, Frison & DeLong, 4 ♂, 8 ♀. FULTON: July 4, 1936, DeLong & Burks, 1 ♀. PRINCETON: in swamp, July 7, 1934, DeLong & Ross, 1 ♀; July 2, 1936, B. D. Burks, 1 ♀. SUMMIT: Aug. 21, 1935, DeLong & Ross, 1 ♂.

##### 5. *Cicadula melanogaster* (Provancher)

*Jassus melanogaster* Provancher (1872, p. 378).

Length 5.0–5.5 mm. Greenish or yellowish, with four large black spots in a row on the margin of vertex; vertex bluntly angled, one-half wider between eyes than length at middle. Female seventh sternite with a sinuate posterior margin that is broadly and shallowly emarginate. Male plates, fig. 464A, abruptly and concavely narrowed on inner margins to produced bluntly pointed apices. Styles long and slender, narrowed near bases and produced into long tapering processes with bluntly pointed apices. Aedeagus long, slender, and usually directed dorsally; basal portion a little thicker and with anterior process; apical portion slender and pointed at tip.

This is the most common species of the genus and occurs in the fresh-water marsh of the northern United States. It is found commonly throughout Illinois.

**Illinois Records.**—Many males and females, taken June 5 to November 17, are from Algonquin, Amboy, Antioch, Atlas, Aurora, Beach, Champaign, Des Plaines, Freeport, Fox Lake, Fulton, Harrisburg,

Havana, Humboldt, Loda, Macomb, New Milford, Ogden, Oquawka, Orangeville, Oregon, Princeton, Round Lake, St. Anne, Seymour, Shawneetown, Spring Valley, Urbana, Vienna, Volo, Warren, Wauconda, and Zion.

##### 6. *Cicadula ciliata* (Osborn)

*Thamnotettix ciliatus* Osborn (1898, p. 244).

Length 5.0–5.5 mm. Green, tinged with yellow, and with four black spots on margin of vertex, fig. 463E. Vertex blunt, almost twice as wide between eyes at base as length at middle. The margin of the female seventh sternite is broadly and shallowly emarginate. Each male plate, fig. 464E, short and broad, strongly and convexly rounded on outer margin, and strongly sloping on inner margin to a blunt apex with a slight toothlike projection. Aedeagus broad at base, constricted and produced dorsally and anteriorly as a wide blade-like structure that is pointed at apex.

This species occurs on sedges in fresh-water marshes throughout the northern United States.

**Illinois Records.**—ALGONQUIN: Aug. 13, 1895, 1 ♂; Sept. 15, 1895, 1 ♂, Oct. 3, 1895, 1 ♂. AMBOY: Aug. 8, 1934, DeLong & Ross, 1 ♂. ELIZABETH: July 7, 1917, 1 ♂. FOURTH LAKE: Aug. 7, 1887, 1 ♂. GRAYS LAKE: June 10, 1936, Ross & Burks, 1 ♀. HUMBOLDT: Nov. 1, 1931, H. H. Ross, 1 ♂, 2 ♀. ORANGEVILLE: Aug. 28, 1934, DeLong & Frison, 1 ♀. SAVANNA: June 14, 1917, 2 ♀. URBANA: Oct. 4, 1909, 2 ♀; Nov. 10, 1915, 1 ♀.

##### 7. *Cicadula longiseta* (Van Duzee)

*Thamnotettix longiseta* Van Duzee (1892b, p. 266).

Length 3.5–4.5 mm. Resembling *melanogaster* somewhat in coloration but with a broad blunt head and a pair of tiny spots back of ocelli in addition to the four on the anterior margin of vertex. Vertex bluntly angled, two-fifths wider between eyes than length at middle. Female seventh sternite sinuate and almost truncate, with posterior margin slightly concave. Each male plate, fig. 464C, short and broad, strongly and convexly rounded on outer and inner margins to form a bluntly pointed apex. Style narrowed gradually from base to form a

long finger-like process on each inner margin, which is strongly curved outwardly, and a much shorter process on outer margin, about one-third the length of the inner process. Aedeagus only slightly enlarged at base, curved dorsally and anteriorly about as far as base, apex bifid.

This is a common species of the genus in the northwestern United States and may occur in western Illinois.

### 8. *Cicadula decipiens* (Provancher)

*Thamnotettix decipiens* Provancher (1890, p. 285).

Length 4.5–5.0 mm. Yellow, tinged with green, with four black spots on vertex, fig. 463*F*, a large one on either side of blunt apex on margin, and one on either side above margin and posterior to ocellus; vertex blunt, almost twice as wide between eyes at base as length at middle. Female seventh sternite with lateral angles rather well produced, between which the posterior margin is sinuately and concavely emarginate more than one-third the distance to base; a very short white blunt tooth at apex of emargination. Male plates, fig. 464*F*, rather broad and short, convexly rounded to blunt apices. Styles long and narrow, inner margin of each produced into a long curved finger-like process, outer margin with a very short spur only. Aedeagus large at base, rapidly constricted to a very slender apical portion, which is long, curves dorsally and anteriorly, and is bifid at apex. A large black bifurcate spine is on the dorso-caudal portion of each pygofer.

This is a transcontinental species found in the fresh-water marsh on sedges.

**Illinois Records.**—ANTIOCH: Aug. 24, 1935, DeLong & Ross, 1 ♀. FOX LAKE: June 30, 1935, DeLong & Ross, 1 ♀. PRINCETON: swamp, July 7, 1934, DeLong & Ross, 1 ♂. SUMMIT: Aug. 21, 1935, DeLong & Ross, 1 ♂.

### 97. *PALUDA* DeLong

*Paluda* DeLong (1937*d*, p. 233).

Fig. 244. The genus is related to *Cicadula* and can be distinguished by a dorsal blunt tooth on the posterior margin of each male plate; the apices of the pygofers terminate in bladelike structures that are produced the length of the segment beyond

its apex and directed dorsally and caudally. The aedeagus is different in type, composed of a broad basal portion and a short narrow apical process. The absence of black spots on the margin of the vertex also separates this genus from *Cicadula*.

Two species have been placed in this genus. One of them is known only from California; the other is chiefly eastern.

### 1. *Paluda mella* (Sanders & DeLong)

*Thamnotettix mellus* Sanders & DeLong (1917, p. 91).

*Thamnotettix placidus* Osborn (1905*b*, p. 536). Name preoccupied.

*Thamnotettix placatus* Baker (1924, p. 367). New name for *placidus*.

Length 5 mm. Small, orange yellow, with vertex broadly rounded, almost twice as wide between eyes as length at middle. Female seventh sternite with rather prominent lateral angles, between which the posterior margin is rather broadly excavated about one-third the distance to base; sides of excavated portion slightly convex, apex rather broad, with a slightly produced rounded tooth at center. Male plates, fig. 244, rather long, gradually and evenly narrowed to bluntly angled apices. Each style sinuately and gradually narrowed from a broad base to outwardly directed and bluntly pointed apex. Aedeagus broad on basal two-thirds, then rapidly narrowed to a slender apical third, which is directed dorsally. Apical portion of each pygofer narrowed into bladelike structure, which is strongly produced caudally and dorsally the length of the pygofer proper.

This species is northern in distribution and apparently inhabits the area occupied by the northern conifer forest. Although apparently having a more northern range than Illinois, it may at some time be found in the extreme northern part of the state.

### 98. *IDIODONUS* Ball

*Idiodonus* Ball (1936, p. 57).

Fig. 235*B*. Head narrower than pronotum, vertex short, blunt, obtusely rounded, and rounded to front. Elytra long, venation simple, with one crossvein. Female seventh sternite produced on posterior margin and with a slight median incision.

DeLong & Knull (1945) recorded 21 species and several varieties of this genus

for the United States. Only two are known to occur in Illinois.

#### KEY TO SPECIES

- Length 6.0 mm. or more; claval vein conspicuously pale in color..... 1. *kennicotti*  
 Length not over 5.75 mm.; reddish brown in color, claval vein not conspicuous..... 2. *brittoni*

#### 1. *Idiodonus kennicotti* (Uhler)

*Jassus kennicotti* Uhler (1863, p 161).

Length 6.0–6.5 mm. Fulvous, vertex dirty yellow, with red ocelli, two large, black spots between them; a pale transverse band at base fulvous. Vertex one-half longer at apex than next to eyes, twice as broad as long. Face dirty yellow. Pronotum with posterior margin and a median transverse band yellow. Elytral nervures lighter than disc, costal and apical areas yellowish hyaline; a broad conspicuous stripe on outer claval vein yellowish. Female seventh sternite, fig. 235*B*, with roundedly produced posterior margin slightly incised and keeled and with a brown spot at center. Male valve short and broad. Plates long, broad at bases, lateral margins concave, tips produced and pointed.

Usually found on oak and other shrubby plants or on tall herbaceous plants in shrubby areas, this species ranges from the eastern United States westward to British Columbia.

**Illinois Records.**—Many males and females, taken May 7 to October 1, are from Apple River Canyon State Park, Cobden, Dixon Springs, Dolson, Dubois, Elizabethtown, Galena, Golconda, Herod, Kankakee, Lawrenceville, Mason City, Muncie, Palos Park, Shawneetown, Temple Hill, Urbana, Vienna, and White Heath.

#### 2. *Idiodonus brittoni* (Osborn)

*Thamnotettix brittoni* Osborn (1907, p. 166).

Length 5.0–5.75 mm. Reddish brown, vertex yellowish, ocelli red and with two black spots between ocelli. Vertex one-third longer at middle than next to eyes. Clavus of each elytron with pale stripe, veins pale, sutural line reddish. Males often golden tinted. Yellow markings absent. Female seventh sternite with posterior margin rounded, slightly notched at center. Male

valve short, plates concave on outer margins, apex narrow.

Previously recorded from the eastern part of the United States, this species usually occurs on shrubs; it is not found in great abundance.

**Illinois Records.**—DUBOIS: Aug. 8, 1917, 1 ♀; Aug. 9, 1917, 1 ♀. ELIZABETHTOWN: May 22–24, 1932, Ross, Dozier, & Park, 1 ♀. GRAFTON: along river, June 26, 1934, DeLong & Ross, 1 ♂. KARNAK: Aug. 8, 1934, Ross, DeLong, & Mohr, 1 ♂, 1 ♀. MONTICELLO: June 11, 1934, 2 ♂. MUNCIE: Sept. 20, 1935, Frison & Mohr, 1 ♂. OAK LAWN: in lamp globe, Aug. 22, 1934, DeLong & Ross, 1 ♂. PULASKI: May 25, 1932, H. L. Dozier, 1 ♀. VIENNA: savanna grasses, June 14, 1934, DeLong & Ross, 1 ♀; July 29, 1934, DeLong & Ross, 1 ♀.

#### 99. *COLLADONUS* Ball

*Colladonus* Ball (1936, p. 57).

Fig. 465. Head conical, much narrower than pronotum, longer and more pointed. Elytra appressed posteriorly. Female seventh sternite with a strap-shaped or spatulate median projection. Male plates together spoon shaped.

DeLong & Knoll (1945) listed 21 species and 3 varieties in this genus for the United States. Two species have been taken in Illinois, and at least one other may occur here.

#### KEY TO SPECIES

1. Vertex with two round black spots on margin; elytra black or dark brown, with a yellow saddle area..... 2  
 Vertex without black spots on margin; elytra paler in color..... 1. *eburatus*
2. Female seventh sternite, fig. 234*B*, with rounded lateral lobes that are not notched..... 2. *clitellarius*  
 Female seventh sternite with lateral lobes decidedly notched posteriorly..... 3. *furculatus*

#### 1. *Colladonus eburatus* (Van Duzee)

*Thamnotettix eburata* Van Duzee (1889*a*, p. 10).

Length 6 mm. Paler in color than *clitellarius* but with the same general pattern. Vertex decidedly produced and bluntly angled, yellow without dark markings. Pronotum, scutellum, and elytra pale brown. Each clavus pale yellow, except anterior



fourth and apex; outer claval vein conspicuously dark brown and apex brownish. Female seventh sternite with broadly rounded lateral lobes; posterior margin deeply excavated on either side of a long

gola, Eldorado, Elizabethtown, Fox Lake, Fulton, Galena, Grafton, Grand Tower, Grays Lake, Havana, Iroquois, Kampsville, Kankakee, Karnak, Keithsburg, La Grange, Lima, Mahomet, Makanda, Meredosia,

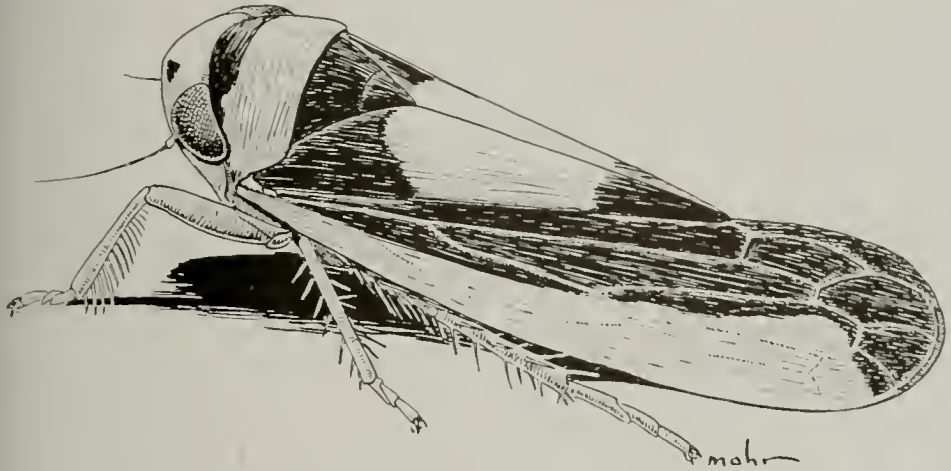


Fig. 465.—*Colladonus clitellarius*.

median spatulate process. Male valve triangular, plates long, slightly and convexly rounded to pointed apices.

This is a northern species occurring in small numbers in wooded areas.

## 2. *Colladonus clitellarius* (Say)

*Jassus clitellarius* Say (1831, p. 309).

Length 5.0–5.5 mm. Brown, with yellow oval saddle spot involving clavus of each elytron, costal area yellowish. Vertex bright yellow, with two large round black spots on apex between ocelli; short and broad, one-fourth longer at middle than next to eyes. Pronotum with a broad brown band on anterior third. Female seventh sternite, fig. 234B, with posterior margin broadly excavated half way to base and with a median tooth produced beyond the lateral lobes. Male plates rather short, apices bluntly rounded.

Abundant and widely distributed in eastern and middle western states, this species apparently occurs on both shrubs and herbs.

**Illinois Records.**—Many males and females, taken May 19 to October 28, are from Algonquin, Alton, Amboy, Antioch, Apple River Canyon State Park, Atlas, Bradley, Byron, Cave in Rock, Champaign, Chemung, Des Plaines, Dixon, Dolson, Don-

Monticello, Mount Carmel, Muncie, New Holland, New Milford, Oak Lawn, Onarga, Oquawka, Oregon, Pike, Pulaski, Quincy, Round Lake, St. Anne, Savanna, Seymour, Shawneetown, Springfield, Starved Rock State Park, Urbana, Vienna, Volo, Warren, White Pines Forest State Park, Wilmington, and Zion.

## 3. *Colladonus furculatus* (Osborn)

*Thamnotettix furculatus* Osborn (1905a, p. 275).

Length 5 mm. Distinguished from *clitellarius* by the posteriorly notched lateral lobes of the seventh sternite of female. Vertex roundedly produced, yellow, with a pair of large black spots at apex. Posterior margin of vertex and anterior portion of pronotum between eyes brown. Scutellum and elytra brown. A pale transparent margin on costa, an oval spot on each clavus yellow. Male plates almost straight margined, acutely angled at apices.

This is usually considered a rather rare species and is found only in small numbers in wooded areas. It has previously been recorded from Pennsylvania and Ohio.

**Illinois Record.**—APPLE RIVER CANYON STATE PARK: Aug. 27, 1934, Frison & DeLong, 1 ♀.

100. *DAVISONIA* Dorst

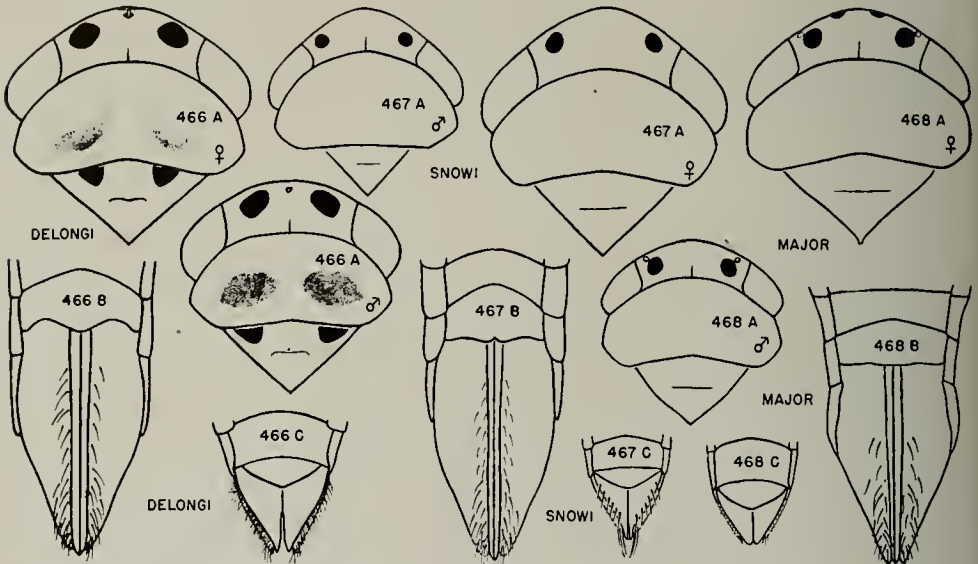
*Davisonia* Dorst (1937, p. 4).

Fig. 213. Vertex transverse and almost parallel margined, broadly rounded to front, front broad. Pronotum broad. Elytra long and broad, slightly narrowed apically, each with two antepical and four apical cells; posterior wings with three apical cells. Male pygofers without caudoventral lobes. Stem of connective twice as long as arms on internal genitalia.

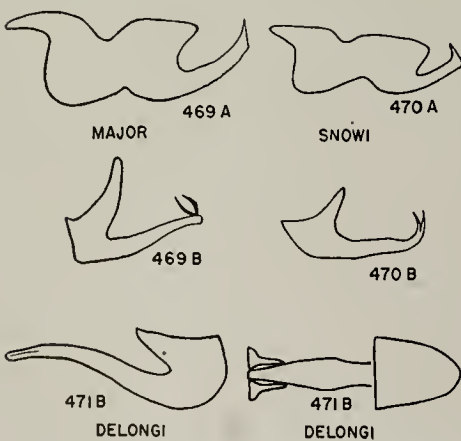
Four species are recorded by Dorst (1937) for the United States, and three of these have been taken in Illinois.

KEY TO SPECIES

1. Vertex almost parallel margined; length 4.5–7.0 mm. . . . . 2  
Vertex, fig. 467, slightly but distinctly longer at middle than next to eyes; length 4.0–5.0 mm. . . . . 1. **snowi**
2. Female seventh sternite, fig. 468B, almost truncate; two small brown spots near apex of vertex, fig. 468A. . . . . 2. **major**



Figs. 466–468.—*Davisonia*. A, head and pronotum; B, female genitalia; C, male external genitalia. (After Dorst.)



Figs. 469–471.—*Davisonia*, male genitalia. A, style; B, aedeagus in lateral or ventral aspect. (After Dorst.)

Female seventh sternite, fig. 466B, with a broad produced median lobe; spot near apex of vertex, fig. 466A. . . . 3. **delongi**

1. *Davisonia snowi* (Dorst)

*Cicadula snowi* Dorst (1931, p. 41).

Length 4–5 mm. Not as robust as *major*, with vertex more produced, bluntly angled. Yellowish, vertex, fig. 467A, with two black spots, one back of each ocellus; elytra whitish hyaline, nervures pale. Female seventh sternite, fig. 467B, almost truncate, with a median small shallow V-shaped notch. Male plates, fig. 467C, more elongate, apexes slender, appearing attenuated. Male aedeagus, fig. 470B, terminating in two short finger-like processes compressed dorsoventrally and ending in sharp points. Styles as in fig. 470A.

Known only from *Salix*, this species is found in the middle western region of the United States and west to Montana and Colorado.

**Illinois Record.**—PIKE: Mississippi flood plain, June 28, 1934, DeLong & Ross, 1 ♀.

### 2. *Davisonia major* (Dorst)

*Cicadula major* Dorst (1931, p. 43).

Length 5–7 mm. Large and robust, yellow, with two large rounded spots on vertex, back of ocelli, fig. 468A, and often with two smaller proximal spots on the margin. Elytra often with grayish stripes. Vertex slightly longer at middle than next to eyes, broadly rounded on anterior margin and broadly rounding to front. Female seventh sternite, fig. 468B, almost truncate, posterior margin slightly produced at middle. Male plates, fig. 468C, short and rather broad, apexes bluntly angled. Aedeagus, fig. 469B, with two short curved processes near apex. Styles as in fig. 469A.

This species occurs on *Salix* in the eastern United States and west to Colorado.

**Illinois Records.**—Males and females, taken June 9 to August 8, are from Alton, Fulton, Grafton, Grand Tower, Havana, Kampsville, Kankakee, Metropolis, New Milford, Pike, Prophetstown, Quincy, Shawneetown, and Warsaw.

### 3. *Davisonia delongi* Dorst

*Davisonia delongi* Dorst (1937, p. 6).

Length 4.5–5.5 mm. Not as robust as *major*, but similarly marked. Vertex, fig. 466A, yellowish, with two large black spots near anterior margin and a smaller black or brown spot near apex; vertex almost parallel margined. Female seventh sternite, fig. 466B, with posterior margin emarginate on either side of a median broad slightly produced tooth; lateral angles produced. Male plates, fig. 466C, broad, triangular, apexes acutely pointed. Aedeagus, fig. 471B, large, bluntly pointed, with two small triangular plates along shaft at apex.

Occurring on *Salix*, this species is distributed in the eastern United States through the Middle West to New Mexico.

**Illinois Records.**—Many males and females, taken June 10 to August 24, are from Algonquin, Apple River Canyon State Park, Centerville, Champaign, Kankakee, Ma-

homet, Metropolis, Monticello, Mount Carmel, New Milford, Urbana, Waukegan, and West Union.

## 101. *SONRONIUS* Dorst

*Sonronius* Dorst (1937, p. 9).

Wing venation as in *Davisonia* and *Macrostoteles*. Each male pygofer with a slight caudoventral notch. Male genital connective stem one and one-half times as long as arms.

Dorst (1937) records three species of this genus, only one of which is known to occur in Illinois.

### 1. *Sonronius clavatus* (DeLong & Davidson)

*Cicadula clavata* DeLong & Davidson (1934, p. 223).

Length 4 mm. Golden yellow, marked with black. Vertex bluntly produced, with a pair of large round black spots just above margin. Pronotum unmarked. Elytra with each clavus dark brown, apical third dark, smoky to brown. Face yellow. Female seventh sternite with posterior margin roundedly produced, almost truncate. Male plates triangular, produced into elongate upturned apices.

This species is very strikingly marked. Nothing is known concerning its biology or food plant. It was described from a small series of specimens from New Jersey and it may represent an importation. It has more recently been found in northern Illinois, but the record is based upon a single specimen.

**Illinois Record.**—ANTIOCH: July 5–7, 1932, 1 ♂.

## 102. *MACROSTELES* Fieber

*Macrosteles* Fieber (1866, p. 504).

Fig. 245B. Vertex longer at middle than next to eyes, bluntly angled. Pronotum short. Elytra long, exceeding the abdomen, the two overlapping apically, each with a distinct appendix, two anteapical cells, and four apical cells. Each hind wing with three closed apical cells. Male plate with attenuated finger-like process. Male pygofers with distinct caudoventral processes. Male aedeagus with two finger-like apical processes. Connective with stem about equal to arms in length.

Sixteen species of *Macrosteles* are recorded by Dorst (1937) for the United States, and six of these are known to occur in Illinois.

## KEY TO SPECIES

1. Length not more than 2.5 mm. . . . . 1. *potoria*  
Length more than 3.0 mm. . . . . 2
2. Spots on vertex, fig. 477*A*, convergent,  
not distinct. . . . . 2. *slossoni*  
Spots on vertex distinct, usually not con-  
tiguous. . . . . 3
3. Vertex, fig. 476*A*, with three distinct pairs  
of spots arranged in two rows. . . . . 3. *divisa*  
Vertex with one or two pairs of spots in  
addition to spots next to eyes. . . . . 4
4. Vertex, fig. 475*A*, with a pair of spots just  
back of ocelli and none between ocelli  
on margin. . . . . 4. *binotata*  
Vertex with a pair of spots back of ocelli  
and another pair between ocelli on  
margin. . . . . 5
5. A pair of spots between ocelli and eyes,  
fig. 472*A*. . . . . 5. *lepida*  
Without spots next to eyes, fig. 473*A*. . . . . 6. *variata*

1. *Macrosteles potoria* (Ball)

*Cicadula potoria* Ball (1900c, p. 346).

Length 2.0–2.5 mm. Very small, black, with a sharply angled vertex. Vertex, pronotum, and scutellum heavily marked with black. Vertex, fig. 474*A*, usually black, with an oblique white spot on either side of a central white stripe, which terminates in a white posterior portion; often entire vertex black. Elytra subhyaline, nervures dark. Female seventh sternite, fig. 474*B*, slightly emarginate at middle. Male plates, fig. 474*C*, very short, apexes sharply pointed and attenuate. Aedeagus, fig. 480*B*, terminating in two slender processes that are crossed and directed laterally. Styles as in fig. 480*C*.

A common species on wet areas of ponds and lagoons on a fine mat of *Eleocharis*, *potoria* is recorded principally from the eastern states.

Illinois Record.—BEACH: July 25, 1934, Frison & DeLong, 4♂, 12♀.

2. *Macrosteles slossoni* (Van Duzee)

*Cicadula slossoni* Van Duzee (1893, p. 281).

Length 3.5–4.0 mm. Smaller than *divisa* and with darker markings. Vertex, fig. 477*A*, bluntly angled, with three pairs of black spots and another next to either eye

usually converging into a curiously shaped black picture. Pronotum and scutellum variously marked with black. Female seventh sternite, fig. 477*B*, truncate, posterior margin slightly sinuate. Male plates, fig. 477*C*, triangular, with pointed attenuated apexes, which are slightly divergent. Aedeagus, figs. 478*A*, 478*B*, similar to that of *divisa*, terminating in two finger-like processes, which are directed caudally. Style as in fig. 478*C*.

A common transcontinental species in marshes and at the margins of swamps, *slossoni* occurs on small vegetation associated with species of *Eleocharis*.

Illinois Record.—MCHENRY: July 27, 1934, DeLong & Ross, 4♀.

3. *Macrosteles divisa* (Uhler)

*Jassus divisus* Uhler (1877, p. 472).

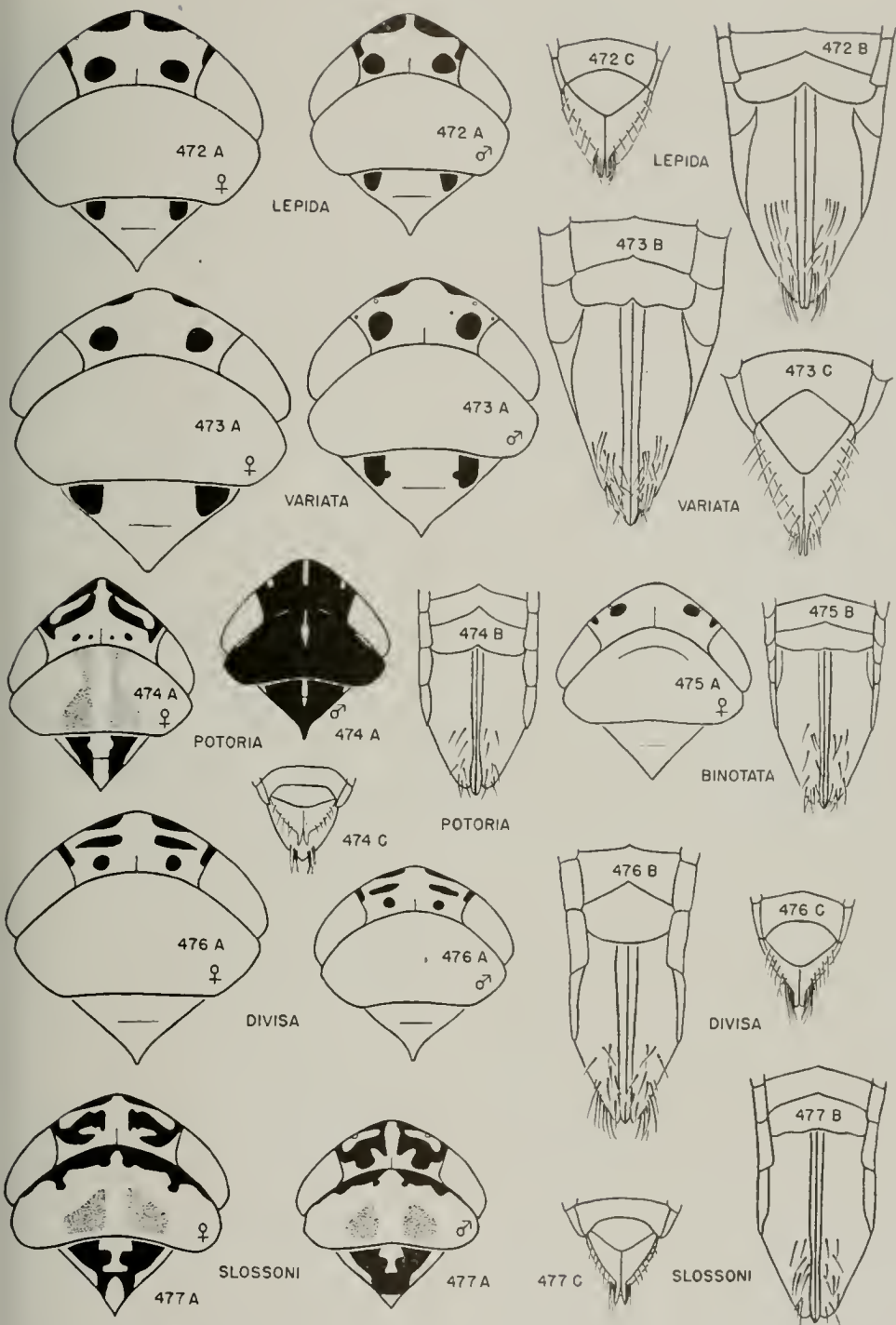
*Cicada sexnotata* Fallen (1806, p. 34). (American records cited in error.)

*Cicadula quadrilineatus* Forbes (1885, p. 68).

Length 3.5–4.5 mm. Greenish yellow, with three pairs of spots or transverse dashes on vertex, fig. 476*A*, the pair of spots on margin and the pair on disc of vertex usually transverse, the posterior pair usually round. There is usually a spot next to each eye. Vertex bluntly produced and rounded to front. Female seventh sternite, fig. 476*B*, with posterior margin truncate or roundedly produced. Male plates, fig. 476*C*, short, triangular, apexes acutely pointed and attenuated. Aedeagus, figs. 481*A*, 481*B*, terminating in two finger-like processes that are produced caudally and pointed at apices. Styles as in fig. 481*C*.

This species is the most common and important of the genus and is common upon many economic plants throughout the United States. It is variable in size and intensity of color markings.

Illinois Records.—Many males and females, taken April 15 to October 30, are from Algonquin, Alsip, Alton, Alto Pass, Antioch, Apple River Canyon State Park, Aurora, Barry, Beach, Bradley, Buda, Bushnell, Cache, Cairo, Carbondale, Carman, Cedar Lake, Champaign, Chemung, Decatur, Des Plaines, Dixon Springs, Duhois, East St. Louis, Evergreen Park, Fox Lake, Fulton, Geff, Gibson City, Grafton, Grays Lake, Harrisburg, Harvard, Havana, Herod, Homer, Horseshoe Lake, Ingleside,



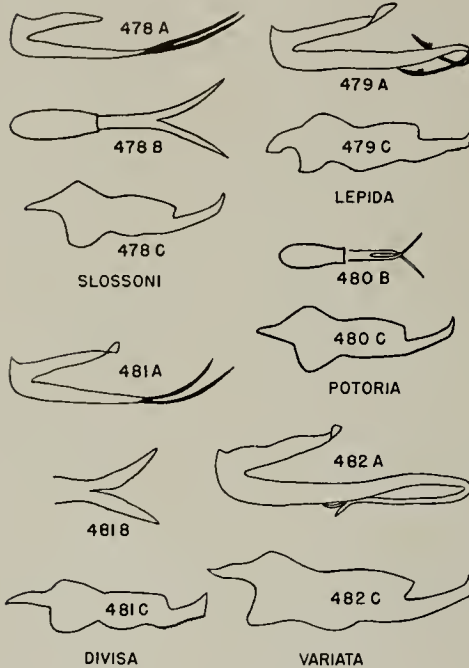
Figs. 472-477.—*Macrosteles*. A, head and pronotum; B, female genitalia; C, male external genitalia. (After Dorst.)

Kampsville, Kankakee, Karnak, Kirkwood, Lake Villa, Lawrenceville, L'Erable, Lima, Luther, Mahomet, Manteno, McHenry, Meredosia, Metropolis, Mokena, Momence, Monmouth, Monticello, Mount Carmel, Mount Sterling, New Holland, Niota,

seventh sternite, fig. 475B, with posterior margin slightly sinuate, almost truncate.

This species is recorded from Ontario, Maine, and Illinois. Only one female has been taken in this state.

Illinois Record.—WAUKEGAN: July 6, 1932, 1 ♀.



Figs. 478-482.—*Macrosteles*, male genitalia. A, lateral aspect of aedeagus; B, ventral aspect of aedeagus; C, style.

Normal, Norris City, Oak Lawn, Oakwood, Oquawka, Ottawa, Palos Park, Pankeyville, Pecatonica, Pike, Port Byron, Princeton, Putnam, Quincy, Quiver Lake, Rantoul, Rock Island, St. Anne, Savanna, Shawneetown, Sheffield, Sparta, Springfield, Spring Valley, Starved Rock State Park, Summit, Thomson, Topeka, Urbana, Ursa, Vandalia, Vienna, Volo, Wauconda, Waukegan, and Zion.

#### 4. *Macrosteles binotata* (Sahlberg)

*Limotettix binotata* Sahlberg (1871, p. 242).  
*Cicadula suffusa* Osborn (1915, p. 146).

Length 5 mm. Similar to *variata*; vertex, fig. 475A, bluntly and angularly produced. Vertex and frons orange yellow, vertex with two black spots just above ocelli and a smaller spot next to each eye. Female

#### 5. *Macrosteles lepida* (Van Duzee)

*Cicadula lepida* Van Duzee (1894a, p. 139).

Length 4-5 mm. Vertex, fig. 472A, more angularly produced than in *variata*, with markings similar except for an additional spot next to each eye. Vertex obtusely angled, yellowish or yellowish green, a pair of large round black spots near posterior margin, two large black proximal spots on anterior margin, and a black spot between ocellus and compound eye on each side. Elytra whitish hyaline, often smoky on basal portion. Female seventh sternite, fig. 472B, with posterior margin convexly rounded on either side of a median broad shallow notch. Male plates, fig. 472C, rather short, apex attenuated and appressed. Aedeagus, fig. 479A, similar to that of *variata*, terminating in two finger-like processes, each recurved beneath for one-third the length of shaft; apical portion armed with teeth. Styles as in fig. 479C.

Rather common in moist areas, especially in woodland marshy habitats, *lepida* occurs in the eastern part of the United States and in the Middle West.

Illinois Records.—Males and females, taken May 7 to August 25, are from Algonquin, Champaign, Dolson, Dubois, East Cape Girardeau, Havana, Karnak, Paxton, Urbana, Vienna, Volo, Wauconda, and Zion.

#### 6. *Macrosteles variata* (Fallen)

*Cicada variata* Fallen (1806, p. 34).  
*Jassus fumatus* Herrick-Schaeffer (1838, fasc. 153, p. 5).

Length 5-6 mm. Yellowish or yellowish green, vertex, fig. 473A, with two large black spots on anterior margin and two large black spots near posterior margin; vertex bluntly and angularly produced. Elytra whitish hyaline, often smoky. Female seventh sternite, fig. 473B, truncate, with a V-shaped notch at center. Male plates, fig. 473C, with long attenuate apices. Aede-

gus, fig. 482A, terminating in two finger-like processes that are about one-half the length of aedeagus shaft and recurved under shaft. Style as in fig. 482C.

A common species on *Impatiens* in moist woodland areas, *variata* is widely distributed in the East and Middle West, and to Colorado and New Mexico.

**Illinois Records.**—Many males and females, taken May 18 to October 16, are from Algonquin, Alton, Antioch, Apple River Canyon State Park, Beach, Charleston, Chemung, Chicago, Dixon, Dolson, Dubois, Elizabeth, Elizabethtown, Elmira, Fern Cliff, Fox Lake, Freeport, Grinnell, Homer, Karnak, Meredosia, Metropolis, Monticello, Mounds, Oak Lawn, Oquawka, Paxton, St. Joseph, Savanna, Shawneetown, Temple Hill, Urbana, Volo, Wauconda, White Heath, Wilmington, and Zion.

Subfamily JASSINAE

This group is characterized by a vertex that is comparatively narrow anteriorly between the eyes but distinctly broadened posteriorly behind the eyes. The vertex is raised between the eyes like a broad keel. The forewing is broad and broadly rounded at apex. Frons long and nearly parallel sided.

Two North American genera belong to this subfamily.

KEY TO GENERA

- Face narrow, sides inflated below eyes, and with frons, fig. 13, about three times as long as wide; ocelli not visible between eyes; end of abdomen exposed beyond elytra, fig. 485 ..... 104. *Tinobregmus*
- Face broad, sides narrowed below eye, and with frons, fig. 14, about twice as long as wide; ocelli visible between eyes; elytra covering abdomen ..... 103. *Jassus*

103. *JASSUS* Fabricius

*Jassus* Fabricius (1803, p. 85).

Figs. 14, 24, 486. Head narrower than pronotum, vertex quadrate, broadly curved anteriorly, only slightly produced before anterior margins of eyes; eyes large, not widely separated. Pronotum very short, emarginate posteriorly. Scutellum large, very wide at base. Elytra broad, rather short, apex broadly rounded.

Four of the five species recorded for the

United States by Lawson (1927) are found in the eastern part of this country, and two of these have been taken in Illinois, while a third species may occur here.

KEY TO SPECIES

- 1. Color dark or transversely banded, but elytra without lighter costal margins; aedeagus bent or hooked at tip; female seventh sternite variable.....2



Female seventh sternite  
Fig. 483.—*Jassus melanotus*.  
Fig. 484.—*Jassus olitorius*.

- Color dark, costal margins pale; female seventh sternite, fig. 483, with shallow apical indentation; apex of lower portion of aedeagus blunt, not bent ..... 1. *melanotus*
- 2. Males dark or usually uniformly colored, females usually with two distinct transverse bands on each elytron; female seventh sternite, fig. 484, with a narrow median incision at produced apex ..... 2. *olitorius*
- Unicolorous or with veins darker, each elytron with not more than one transverse band; female seventh sternite with a faint notch at apex...3. *borealis*

1. *Jassus melanotus* Spangberg

*Jassus melanotus* Spangberg (1878a, p. 19).

Length of male 6.0 mm., female 7.5 mm. Robust; pronotum, scutellum, and elytra dark brown to black, without pale transverse bands in female but with each apex and costal margin pale, often conspicuously yellow. Vertex light greenish yellow, median longitudinal line brown; eyes dark. Face greenish, with sides showing faint fuscous arcs. Venter yellowish, marked with black. Female seventh sternite, fig. 483, with posterior margin bisinuate, forming three lobes, the central one larger, longer than lateral lobes and keeled at center. Male plates long and narrow. Ventral portion of aedeagus with apical portion bent anteriorly and with an apical spine.

This species has been collected in low

marshy areas in the willow-sedge habitat. It occurs in the eastern and middle western states. The food plant is not known.

**Illinois Records.**—Males and females, taken June 27 to August 28, are from Alto Pass, Apple River Canyon State Park, Chemung, Fountain Bluff, Golconda, Grand Tower, Jonesboro, Karnak, Shawneetown, Vienna, Warren, White Pines Forest State Park, and Wolf Lake.

## 2. *Jassus olitorius* Say

*Jassus olitorius* Say (1831, p. 310).

*Jassus subbifasciatus* Say (1831, p. 310).

*Jassus fuscipennis* Spangberg (1878a, p. 20).

Fig. 486. Length 6.0–7.5 mm. Female vertex dull yellow, with brown ocelli and markings; pronotum light brown, a pale median stripe bordered with a dark stripe on either side; scutellum with the basal angles and two spots on disc black; elytra brown, nervures black, interrupted twice by light transverse bands. Male with pronotum, scutellum, and elytra darker than in female, without transverse bands on elytra. Vertex obtusely rounded, about as long as basal width. Female seventh sternite, fig. 484, twice as long as preceding, strongly produced and keeled at middle. Male plates long and narrow. Lower portion of aedeagus blunt at apex, with an apical and a ventrocaudal spine.

Common on oak, sassafras, and similar shrubs, *olitorius* occurs in the East and Middle West, and southwest to Arizona.

**Illinois Records.**—Many males and females, taken June 21 to October 1, are from Aldridge, Alto Pass, Apple River Canyon State Park, Ashley, Byron, Carbondale, Charleston, Dixon Springs, Dolson, Dongola, Dubois, Elizabethtown, Fountain Bluff, Golconda, Grand Tower, Herod, Jonesboro, Kampsville, Kankakee, Karnak, La Rue, Lawrenceville, Makanda, Marshall, Metropolis, Normal, Oakwood, Olive Branch, Onarga, Pekin, Pulaski, Quincy, River Forest, Rock Island, St. Joseph, Shawneetown, Sugar Grove, Sumner, Temple Hill, Urbana, Vienna, Warren, Watson, White Heath, and Wolf Lake.

## 3. *Jassus borealis* Spangberg

*Jassus borealis* Spangberg (1879, p. 24).

Length 5.5–8.0 mm. Rusty brown to dark brown, vertex usually yellow, with two

darker spots posterior to middle. Basal angles of scutellum sometimes black. Elytra usually unicolorous, sometimes with paler areas on each clavus and across apexes of anteapical cells; apexes of elytra sometimes tinted with fuscous. Female seventh sternite with distinct lateral angles between which the posterior margin is rather strongly and broadly produced with a faint notch at apex. Male plates long, with rounded apexes. Aedeagus similar to that of *olitorius* but ventral process slightly more enlarged at apex.

This species is known only from South Carolina, Georgia, and Florida.

## 104. *TINOBREGMUS* Van Duzee

*Tinobregmus* Van Duzee (1894b, p. 213).

Figs. 13, 485. Head narrow, short, conical, vertex narrow between eyes, widened anteriorly, expanded behind the eyes; ocelli on vertex near apex; eyes large. Pronotum short, wider than head. Elytra short, extending to middle of abdomen, each with five apical areoles, the outer one much larger. Posterior wings rudimentary. The very small scutellum and elongated face distinguish this from most other genera of Nearctic Cicadellidae.

Lawson (1932a) records four species and one variety of this genus for the United States; only one of these is known to occur in Illinois.

### 1. *Tinobregmus viridescens* DeLong

*Tinobregmus viridescens* DeLong (1916, p. 92).

Fig. 485. Length of male 4.0 mm., female 6.5 mm. Elytra yellowish green; a broad band at each apex, and irregular longitudinal lines running forward from the apex black. Male vertex black; sutures and a triangular area between vertex and eye and the margin of the occiput pale; pronotum greenish yellow. Elytra of male and female similarly marked. Female seventh sternite with a slightly sinuate posterior margin. Male valve and almost all of plates concealed in concavity of last sternite. Pygofers large, curving over the plates.

This species occurs on rank herbaceous growth, especially in open woodland in the middle western and eastern states.

**Illinois Records.**—ASHLEY: July 6, 1889, Marten, 1 ♂. DUBOIS: June 22, 1905,



1 ♀; sweeping from grass, July 2, 1909, 2 ♂, 1 ♀; Aug. 9, 1917, 1 ♂, 6 ♀; Aug. 18, 1917, 3 ♂. METROPOLIS: Aug. 19, 1891, Shiga, 1 ♀. ROSICLARE: July 5, 1935, Frison & Mohr,

Oman (1931) and Knull (1942) have recorded 21 species and several subspecies of *Neocoelidia* for the United States, all of which are western or southwestern in dis-

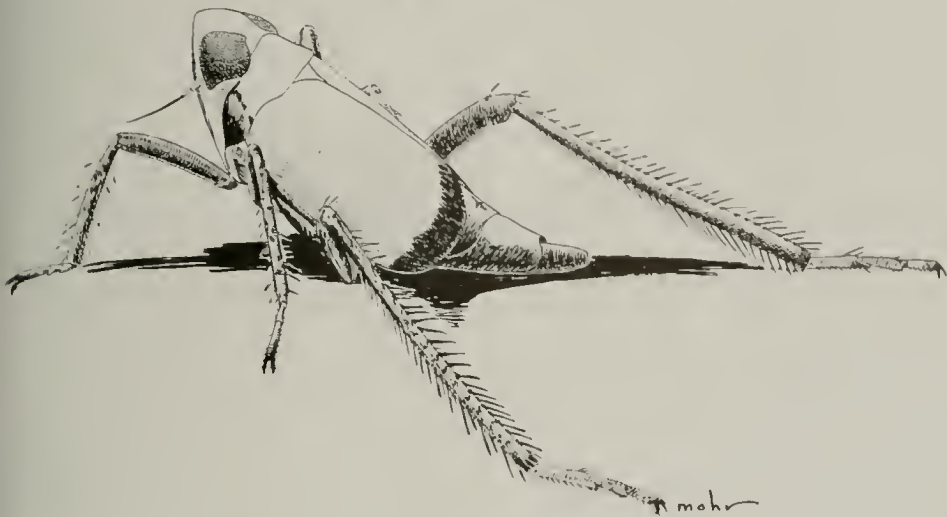


Fig. 485.—*Tinobregmus viridescens*.

1 ♀. SHAWNEETOWN: June 23, 1936, DeLong & Ross, 1 ♂; June 27, 1936, DeLong & Mohr, 2 ♂. VIENNA: June 14, 1934, DeLong & Ross, 1 nymph; July 29, 1934, DeLong & Ross, 2 ♂, 7 ♀.

tribution. One species, *tumidifrons*, has extended its range into the eastern states.

#### Subfamily NEOCOELIDIINAE

This group contains two Nearctic genera characterized by a raised vertex above and in front of the eyes. They are similar to the Jassinae in this feature, but the frons is expanded dorsad and is not as long and not as nearly parallel as in the Jassinae.

#### KEY TO GENERA

Clypeus with a distinct tubercle . . . . . 106. *Paracoelidia*  
Clypeus not tuberculate . . . . . 105. *Neocoelidia*

#### 105. *NEOCOELIDIA* Gillette & Baker

*Neocoelidia* Gillette & Baker (1895, p. 103).

Head narrower than pronotum, short, obtusely conical. Front broad, almost parallel, antennae long. Pronotum short and broad, anterior and posterior margins nearly parallel. Scutellum large. Elytra variable in length, first sector branched once on the apical two-thirds with four apical cells.

#### 1. *Neocoelidia tumidifrons* Gillette & Baker

*Neocoelidia tumidifrons* Gillette & Baker (1895, p. 104).

Fig. 487. Length 4 mm. Pale yellow or pale greenish, robust, usually with a black spot in each basal angle of scutellum. Vertex and face often washed with orange. Vertex curved to front, one-half longer at middle than next to eyes. Pronotum three times as broad as long. Elytra broad and rather short, reaching just to tip of abdomen. Female seventh sternite with posterior margin broadly excavated and with a short median tooth; lateral angles slightly rounded. Male valve broadly triangular. Plates more than one-half longer than valve, gradually tapered from bases to pointed apexes, exceeded by pygofers at apexes. Pygofers visible at the sides of plates to bases.

Common in moist wooded areas, especially where herbaceous growth is abundant, this species has been found in the eastern states and west to Texas and Colorado.

Illinois Records.—Males and females, taken May 9 to August 23, are from Alto Pass, Dongola, Dubois, Evergreen Park,

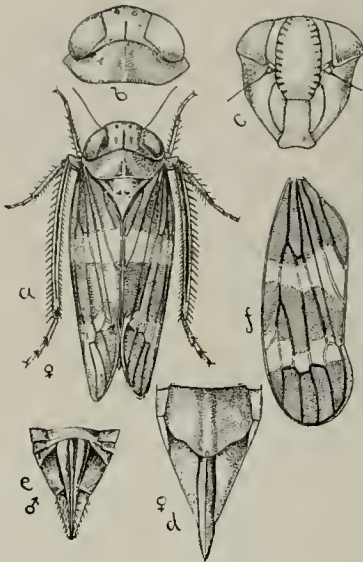


Fig. 486.—*Jassus olitorius*: a, adult; b, head and pronotum; c, face; d, female genitalia; e, male genitalia; f, elytron. (From Osborn.)

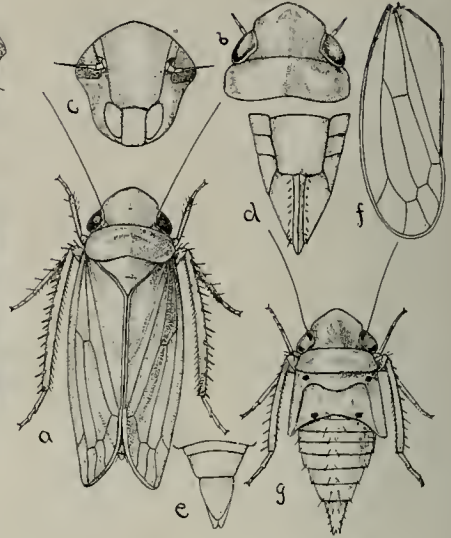


Fig. 487.—*Neocoelidia tumidifrons*: a, adult; b, head and pronotum; c, face; d, female genitalia; e, male genitalia; f, elytron; g, nymph.

Jonesboro, Karnak, Oak Lawn, Oakwood, Olive Branch, Pankeyville, Shawneetown, Vienna, and Wauconda.

106. *PARACOELIDIA* Baker

*Paracoelidia* Baker (1898f, p. 292).

Very similar to *Neocoelidia*, but with a decided tubercle on clypeus. Wings always long and narrow.

Only one of the three Nearctic species may occur in Illinois. The others are known only from Arizona.

1. *Paracoelidia tuberculata* Baker

*Paracoelidia tuberculata* Baker (1898f, p. 292).

Length 5 mm. Slender, elongate, similar in general appearance to the western species of *Neocoelidia*, but with a tubercle on the clypeus. Vertex produced, subangulate. Color yellowish, elytra subhyaline, a smoky stripe along the inner margins, and apexes smoky. Female seventh sternite truncate. Male valve long, angled, tapering. Male plates short, apexes obtuse.

Although common on pine in various areas of the eastern and southern United States, *tuberculata* has not been taken in Illinois. Eventually it may be found here.

Subfamily BALCLUTHINAE

The two anteapical cells of the forewing and three apical cells of the hind wing will easily separate the members of this group from other subfamilies, except some long-winged forms of normally short-winged Athysaninae.

Representatives of two genera belonging to this group occur in Illinois.

KEY TO GENERA

- Head narrower than pronotum, somewhat angularly produced, fig. 28..... 107. *Balclutha*
- Head wider than pronotum, vertex not produced, broadly rounded, fig. 25..... 108. *Nesosteles*

107. *BALCLUTHA* Kirkaldy

*Gnathodus* Fieber (1866, p. 505). Name pre-occupied.

*Balclutha* Kirkaldy (1900, p. 243). New name. *Eugnathodus* Baker (1903, p. 1).

Fig. 28. Head narrower than pronotum, vertex broadly rounded to bluntly and angularly produced. Each elytron with inner sector not forked, forming two anteapical cells. Aedeagus usually enlarged at base but not forming a dorsally directed process at anterior end.

Davidson & DeLong (1935) recorded

six species and two varieties for the United States, of which three species and the two varieties occur in Illinois. The other species are western.

## KEY TO SPECIES

1. Vertex broadly rounded; aedeagus, fig. 489*A*, short, apex curved caudally and dorsally but not anteriorly.

1. *abdominalis*

Vertex bluntly angled; aedeagus longer, directed anteriorly at apex and sometimes extending into preceding segment

2

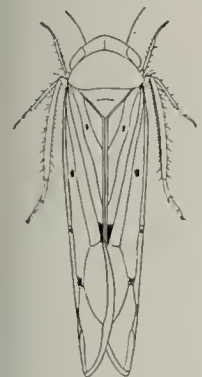


Fig. 488.—*Balclutha punctata*. (From Osborn.)

2. Aedeagus, fig. 489*B*, abruptly narrowed near base to a long and slender portion, which extends to posterior margin of preceding segment

3

Aedeagus, fig. 489*C*, shorter, basal portion more gradually narrowed to apical portion, which extends anteriorly only about half way to posterior margin of preceding segment; dorsum marked with brown.

2. *punctata*

3. Color yellowish, sometimes washed with pale green

3. *impicta*

Color usually dark green, or if pale then marked with black or brown

4

4. Color dark green, veins conspicuously green or rugose

4. *impicta* var. *osborni*

Color yellowish or greenish, mottled with dark green or black

5. *impicta* var. *maculata*

1. *Balclutha abdominalis* (Van Duzee)

*Gnathodus abdominalis* Van Duzee (1892*b*, p. 113).

Length 3 mm. Dull yellow, ocelli dark; vertex bluntly rounded, a little more than twice as wide as median length, produced more than one-half its length before anterior margins of the eyes. Pronotum with prominent lateral angles. Aedeagus in lateral view, fig. 489*A*, with a basal enlargement extending dorsally; apical portion gradually tapering to a dorsally directed tip. Styles with

thick blunt apical processes. Connective thick at base, with a rather narrow incision. Apex enlarged and slightly indented at middle.

This is a common transcontinental species which, in Illinois, occurs on herbaceous growth.

**Illinois Records.**—Many males and females, taken April 21 to November 15, are from Algonquin, Alton, Alto Pass, Anna, Apple River Canyon State Park, Beach, Brownfield, Cave in Rock, Champaign, Dixon, Dixon Springs, Dolson, Dongola, Effingham, Eichorn, Elizabethtown, Evergreen Park, Farina, Fulton, Geff, Golconda, Grafton, Hanover, Havana, Herod, Ingle-side, Justice, Kampsville, Monticello, Muncie, Newton, Norris City, Oakwood, Oquawka, Oregon, Pike, Port Byron, Princeton, Pulaski, Rock Island, St. Anne, Savanna, Savoy, Shawneetown, Springfield, Starved Rock State Park, Urbana, Vienna, Volo, Wauconda, White Heath, and Zion.

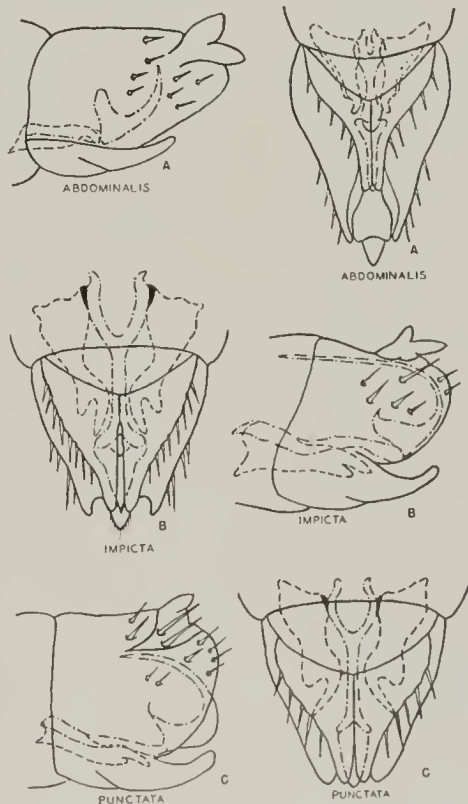


Fig. 489.—*Balclutha*, male genitalia. A-C, ventral and lateral aspects.

## 2. *Balclutha punctata* (Thunberg)

*Cicada punctata* Thunberg (1784, p. 21).  
*Gnathodus confusus* Gillette & Baker (1895, p. 104).  
*Gnathodus occidentalis* Baker (1896a, p. 41).  
*Gnathodus livingstoni* Baker (1896a, p. 42).

Fig. 488. Length 3.5–4.0 mm. Color variable from gray or pale yellow to green and with markings variable or absent. The well-marked specimen with a somewhat reddish broken transverse band across vertex; mottlings on anterior portion of pronotum and median longitudinal line of pronotum, and basal angles and median line on scutellum reddish or brown. Elytra frequently with veins ferruginous or brown; inner portion of each clavus and a broken oblique band extending almost to costa brown; tip of clavus, spot on disc, also spots on posterior portions of anteapical cells, and portions of outer and inner apical cells brown. Vertex bluntly angled, almost parallel margined, nearly four times as wide between eyes as median length, produced almost its entire length before anterior margins of the eyes.

Aedeagus in lateral view, fig. 489C, gradually tapering from a broad elongated basal portion to a slender apical portion that is pointed and curves dorsally, then anteriorly, the apex reaching the middle of the last segment or a little farther cephalad. Apex of connective terminating in two rather narrow divergent processes.

A common species in Illinois, *punctata* ranges from the Middle West to British Columbia.

**Illinois Records.**—Many males and females, taken March 26 to November 12, are from Algonquin, Alto Pass, Amboy, Apple River Canyon State Park, Beach, Chemung, Danville, Dubois, Effingham, Fountain Bluff, Herod, Hopedale, Lake Villa, Mahomet, Monticello, Muncie, Oakwood, Ozark, Palos Park, Rock Island, Urbana, Volo, White Heath, and Zion.

## 3. *Balclutha impicta* (Van Duzee)

*Gnathodus impictus* Van Duzee (1892b, p. 113).

Length 3.5 mm. Yellow, tinged with green. Vertex bluntly angled, conspicuously narrower than pronotum, more than three times as wide as median length, produced two-thirds its length before anterior mar-

gins of the eyes. Aedeagus in lateral view, fig. 489B, enlarged at base, apical portion long and narrow, extending dorsally, then directed anteriorly along dorsal wall into preceding abdominal segment. Styles deeply notched at apexes forming long curved inner finger-like processes. Connective widely and deeply notched at base, forming a pair of widely separated curved processes. Apex deeply notched so as to form two rounded divergent tips.

A very common species in Illinois, *impicta* is found in the eastern states and west to Washington.

**Illinois Records.**—Many males and females, taken May 10 to September 20, are from Algonquin, Antioch, Apple River Canyon State Park, Atlas, Beach, Buckley, Buda, Cairo, Cave in Rock, Champaign, Chemung, Danville, Dixon Springs, Dolson, Dongola, Dubois, Eichorn, Elizabeth, Elizabethtown, Farina, Fourth Lake, Grafton, Havana, Herod, Justice, Kampsville, Karnak, La Grange, Lake Villa, Macomb, Monticello, Muncie, New Milford, Newton, Niota, Norris City, Oakwood, Oregon, Palos Park, Pike, Port Byron, Rock Island, Round Lake, St. Anne, Savanna, Seymour, Shawneetown, Springfield, Starved Rock State Park, Temple Hill, Urbana, Ursa, Vienna, Volo, Warsaw, Wauconda, White Heath, White Pines Forest State Park, Wilmington, and Zion.

## 4. *Balclutha impicta* var. *osborni*

Van Duzee

*Gnathodus viridis* Osborn (1905b, p. 541).

Name preoccupied.

*Balclutha osborni* Van Duzee (1916, p. 75).  
 New name.

Length 3.5–4.0 mm. Size and form of *impicta*, with the same type of genital characters. Color yellowish, tinted with green. Venation dark green, rugose.

This form has been recorded from the eastern states and Canada, and a few specimens have been taken in Illinois.

**Illinois Records.**—APPLE RIVER CANYON STATE PARK: July 11, 1934, DeLong & Ross, 2♂, 2♀. DONGOLA: Aug. 23, 1916, 1♂, 1♀. JONESBORO: State Forest, July 31, 1934, DeLong & Mohr, 1♂. URBANA: July 21, 1889, C. A. Hart, 1♂. VIENNA: June 14, 1934, DeLong & Ross, 2♂. VOLO: July 27, 1934, DeLong & Ross, 1♂.

5. *Balclutha impicta* var. *maculata*

Davidson &amp; DeLong

*Balclutha impicta* var. *maculata* Davidson & DeLong (1935, p. 101).

Length 3.5 mm. Coloration same as in well-marked specimens of *punctata*, but with size and genitalia of *impicta*. Markings frequently very heavy, with vertex, pronotum, and entire elytra heavily mottled with brown; often bright green, with heavy markings on posterior portion of pronotum; elytra with scattered spots on each clavus, a large spot at apex, and three or four conspicuous spots on central portion brown. Degree and intensity of spotting vary.

This variety is recorded from the eastern states and west to Wisconsin and Illinois.

**Illinois Records.**—Many males and females, taken April 5 to November 25, are from Algonquin, Apple River Canyon State Park, Carmi, Champaign, Dolson, Dongola, Duncans Mills, Fulton, Golconda, Muncie, Newton, Port Byron, Pulaski, Rock Island, St. Joseph, Springfield, Starved Rock State Park, Urbana, Volo, Warren, White Heath, and White Pines Forest State Park.

108. *NESOSTELES* Kirkaldy

*Nesosteles* Kirkaldy (1906, p. 343).

*Agellus* Davidson & DeLong (1933, p. 210).

Fig. 25. Vertex broadly rounded and scarcely produced before the anterior margins of the eyes, anterior and posterior margins almost parallel; head slightly broader than pronotum, lateral posterior angles of pronotum not wider than vertex. General venation as in *Balclutha*, with inner sector of elytron not forked, two antepical cells being produced. Aedeagus with dorsobasal protruding processes. In *Balclutha* the basal portion is enlarged and may extend dorsally but without finger-like processes.

Davidson & DeLong (1935) record eight species and one variety in the United States, but only one species and the only variety in the genus are known to occur in Illinois.

1. *Nesosteles neglecta* (DeLong & Davidson)

*Eugnathodus neglecta* DeLong & Davidson (1933, p. 55).

Length 3.5 mm. Pale to dark brown in color, often with rather conspicuous mark-

ings on vertex, pronotum, and scutellum. Elytra smoky to white. Vertex broadly rounded, almost parallel margined, and about four times as wide as long. Female seventh sternite almost truncate, posterior margin slightly emarginate on either side of a central slightly produced inconspicuous median tooth. Male plates triangular, about half as wide at base as long. Aedeagus in lateral view rather heavy at base, anterior process extending dorsally, arising not far from the point of union with the connective; body of aedeagus extending caudally, tapered, and extending dorsally and slightly posteriorly; terminal portion about twice the length of the anterior process.

This species is common and widely distributed in the United States and is found throughout Illinois.

**Illinois Records.**—Many males and females, taken May 4 to October 11, are from Alton, Apple River Canyon State Park, Beach, Billett, Carman, Collinsville, Evergreen Park, Fox Lake, Fulton, Galena, Hanover, Havana, Herod, Lawrenceville, Monmouth, Monticello, Mount Carmel, Mount Sterling, Muncie, Oakwood, Ogden, Oquawka, Pere Marquette State Park, Pike, Port Byron, Rock Island, Starved Rock State Park, Thomson, Urbana, Vienna, and Zion.

2. *Nesosteles neglecta* var. *pallidens*  
DeLong

*Eugnathodus neglecta* var. *pallida* DeLong & Davidson (1933, p. 56). Name preoccupied. *Nesosteles neglectus* var. *pallidens* DeLong (1944b, p. 272). New name.

Length 3.0–3.5 mm. In form and general appearance similar to typical *neglecta*, but pale green or white in color. Disc of pronotum sometimes slightly darker than adjacent areas, and dorsal portion of abdomen black or dark brown. Genital characters as in typical *neglecta*.

This form was previously recorded from the southern states.

**Illinois Records.**—HEROD: Aug. 4, 1934, DeLong & Mohr, 1♂. MONMOUTH: at light, July 2, 1934, DeLong & Ross, 1♂.

## Subfamily CICADELLINAE

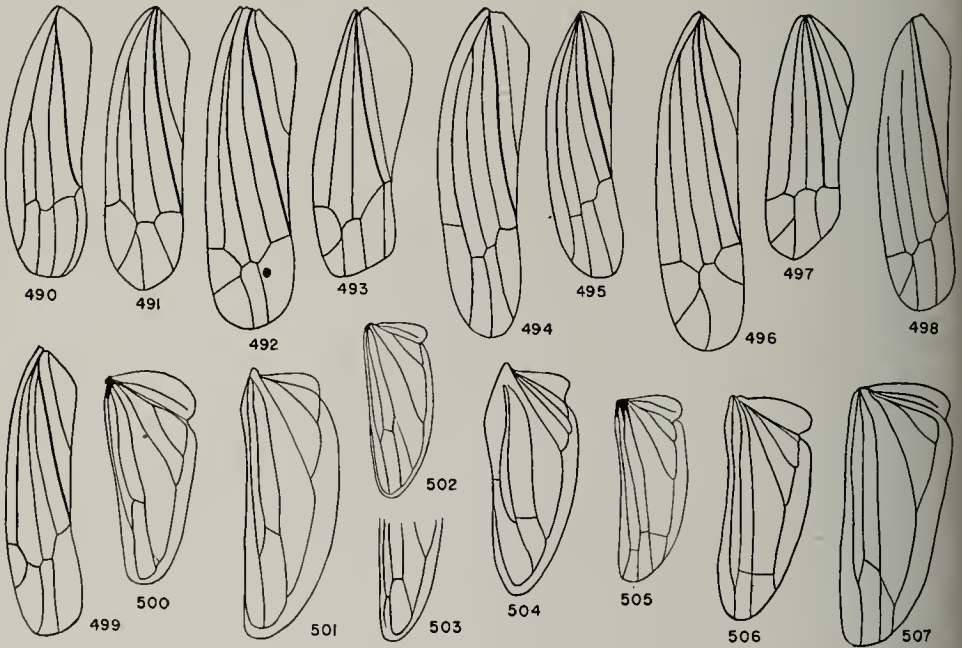
The insects of this group are small and frail. This characteristic alone will usually

separate them from those of other groups. The absence of crossveins anterior to the apical crossveins is always a good way to characterize these species, and the ocelli are often absent.

As mentioned in the foreword, the size of the group precluded a detailed treatment of the subfamily Cicadellinae in the present project. I have included, however, a key to the Nearctic genera of the subfamily, together with notes on generic diagnosis as an aid to the student in identifying material. As a further aid in this direction, citations are given under several genera to comprehensive taxonomic papers treating them.

KEY TO GENERA

1. Each elytron with definite appendix, with three or four closed apical cells, as in fig. 490..... 2
2. Appendix curved and ending at about apical cell; elytra each with four apical and no anteapical cells, fig. 490. Each hind wing with curved anterior veins definitely surrounded by wing membrane ..... 110. *Alebra*  
Appendix nearly straight, not extending to apical cell; elytra each with three or four apical cells, anteapicals sometimes present, fig. 493. Each hind wing with the curved anterior apical vein marginal ..... 109. *Protalebra*
3. Veins of hind wings ending in a marginal vein, apical cells closed, fig. 500..... 4  
Veins of hind wings extending to margin, one or more apical cells not closed, fig. 505..... 10
4. Anterior apical vein of each hind wing not coalescing with costal margin, continuous with first sector in bounding the outermost closed apical cell, fig. 500... .. 115. *Empoasca*



Elytra of Cicadellinae

- |   |  |
|---|--|
| Fig. 490.— <i>Alebra albostriella</i> .     | Fig. 495.— <i>Forcipata loca</i> .         |
| Fig. 491.— <i>Empoasca obtusa</i> .         | Fig. 496.— <i>Typhlocyba</i> sp.           |
| Fig. 492.— <i>Alconeura rotundata</i> .     | Fig. 497.— <i>Dikraneuroidea beameri</i> . |
| Fig. 493.— <i>Protalebra brasiliensis</i> . | Fig. 498.— <i>Idona minuenda</i> .         |
| Fig. 494.— <i>Dikraneura mali</i> .         | Fig. 499.— <i>Erythroneura obliqua</i> .   |

Hind wings of Cicadellinae

- |                                     |  |
|-------------------------------------|--|
| Fig. 500.— <i>Empoasca obtusa</i> . | Fig. 504.— <i>Dikraneuroidea beameri</i> . |
| Fig. 501.— <i>Idona minuenda</i> .  | Fig. 505.— <i>Cicadella flavoscuta</i> .   |
| Fig. 502.— <i>Forcipata loca</i> .  | Fig. 506.— <i>Typhlocyba querci</i> .      |
| Fig. 503.— <i>Joruma</i> sp.        | Fig. 507.— <i>Erythroneura obliqua</i> .   |

Anterior apical vein of each hind wing directed toward, often joining, costal margin, not continuous with first sector and not forming part of boundary of outermost distally closed apical cell, fig. 502 . . . . . 5

5. Each hind wing with two closed apical cells, fig. 502 . . . . . 6

Each hind wing with one closed apical cell, fig. 501 . . . . . 8

6. Second apical cell of each elytron distinctly pedunculate at base, fig. 492 . . . . . 113. *Alconeura*

Second apical cell of each elytron not pedunculate at base, fig. 494 . . . . . 7

7. Elytra each with first crossvein present, fig. 494; male plates, fig. 512*A*, flat, triangular; female seventh sternite, fig. 512*C*, rounded . . . . . 112. *Dikraneura*

Elytra each with first crossvein wanting; second, third, and fourth crossveins spaced more distant from each other than above, fig. 495; male plates, figs. 514*A*, 514*B*, cylindrical, narrow, greatly separated at middle; female seventh sternite, fig. 514*C*, with a large median strongly produced lobe . . . . . 114. *Forcipata*

8. Elytral crossveins usually not meeting; third apical cell pedunculate, fig. 498 . . . . . 116. *Idona*

Elytral crossveins usually in line; second apical cell pedunculate, fig. 497; hind wing as in fig. 504 . . . . . 111. *Dikraneuroidea*

9. Hind wings with at least one closed and one open apical cell, fig. 503 . . . . . 117. *Joruma*

Hind wings with no closed apical cells, fig. 505 . . . . . 10

10. Hind wing with four veins extending to margin of wing, forming three open apical cells, fig. 505 . . . . . 118. *Cicadella*

Hind wing with three veins extending to margin of wing, forming two open apical cells, fig. 506 . . . . . 11

11. Elytra with fourth apical vein of each curving to rounded margin; second apical cell triangular, usually stalked, fig. 496 . . . . . 119. *Typhlocyba*

Elytra with fourth apical vein of each more nearly paralleling margin, second apical cell quadrate, not stalked, fig. 499 . . . . . 12

12. Scutellum elevated at apex, fig. 513*E* . . . . . 120. *Hymetta*

Scutellum flat, not elevated at apex . . . . . 121. *Erythroneura*

109. *PROTALEBRA* Baker

*Protalebra* Baker (1899, p. 402).

Fig. 493. This genus is characterized by having a definite appendix on each elytron, appendix not extending around the apex; the elytron has four apical and no ante-apical cells. The species of this genus are tropical or subtropical, and only two are recorded for the United States. One of

these, *brasiliensis* Baker (1899, p. 405), occurs in the United States in Florida and Texas only.

110. *ALEBRA* Fieber

*Alebra* Fieber (1872, p. 14).

Fig. 490. This genus has a definite appendix extending around the apex of each elytron. There are four apical and no ante-apical cells in the elytron. The vertex is usually rather broadly rounded and scarcely or only slightly produced anteriorly.

Insofar as known the members of this genus feed upon trees and shrubs. About a dozen species and varieties have been recorded for the Nearctic region. The common species of the genus in Illinois is *albo-striella* (Fallen) (1826, p. 54).

111. *DIKRANEUROIDEA* Lawson

*Dikraneuroidea* Lawson (1929, p. 307).

Figs. 497, 504. The only member of this genus resembles certain species of *Dikraneura*, but it has only one closed apical cell in the hind wing. It is further distinguished from closely related genera by having the crossveins almost in a straight line. The only known species of this genus, *beameri* Lawson (1929, p. 307), occurs in Texas.

112. *DIKRANEURA* Hardy

*Dikraneura* Hardy (1850, p. 423).

Fig. 494. The genus *Dikraneura* belongs to the group of genera that have two closed apical cells in the hind wing. Each elytron has the first crossvein present, and one or both of the first and fourth crossveins are but little basad of the second and third; the latter two are usually but little basad of each other. The vertex is usually well produced and bluntly, sometimes pointedly, angled.

About 60 Nearctic species have been described, and several occur in Illinois. A common grassland and pasture species is *mali* (Provancher) (1890, p. 298). The vertex, female seventh sternite, and male genitalia are shown in fig. 512.

113. *ALCONEURA* Ball & DeLong

*Alconeura* Ball & DeLong (1925, p. 334).

Fig. 492. This genus is closely related to *Dikraneura* and contains species that are

small, robust, and usually highly ornamented. Each hind wing has two closed apical cells. Each elytron has four distinct apical cells; the second cell is always triangular and pedunculate. Due to the union of the second and third nervures for some distance at the base, the first cell is distinct but irregular in shape.

Griffith (1936) records 20 Nearctic species of *Alconeura*, and nearly all are found in the West and Southwest. One species, *rotundata* Ball & DeLong (1925, p. 335), has been taken in the states just west of Illinois, and may be collected at some time in this state.

#### 114. *FORCIPATA* DeLong & Caldwell

*Forcipata* DeLong & Caldwell (1942, p. 49; see also 1936, p. 70).

Figs. 495, 502. The species of this genus have bluntly angled heads and resemble species of *Dikraneura* in form and general appearance. They are usually yellow, tinged with orange, and have genital structures that differ from those of allied genera. The male plates are cylindrical, strongly curved outwardly at base so that they are widely separated at middle. The female seventh sternite bears a large strongly produced median lobe that differs in shape among the species, but always occupies the median half or more of the posterior margin. Each elytron lacks the first crossvein, and the second, third, and fourth crossveins are more widely separated than in the *Dikraneura* elytron.

Ten species of *Forcipata* are known for the United States, of which *loca* DeLong & Caldwell (1936, p. 71; 1942, p. 49) is the most widely distributed eastern one. It is common in Illinois on small grasses in pastures and open woodland.

#### 115. *EMPOASCA* Walsh

*Empoasca* Walsh (1862, p. 149).

Figs. 491, 500, 508. For the most part this genus contains small delicate greenish species of leafhoppers. The members of this genus can most easily be distinguished from their close generic relatives by the absence of an appendix on the elytron and by the presence of one apical cell in the hind wing, which is closed by a submarginal vein. As in other related genera there are

no anteapical cells present in either pair of wings.

*Empoasca* contains nearly 200 described Nearctic species, and several of them are of economic importance. Two common species in Illinois are *maligna* (Walsh) (1864,

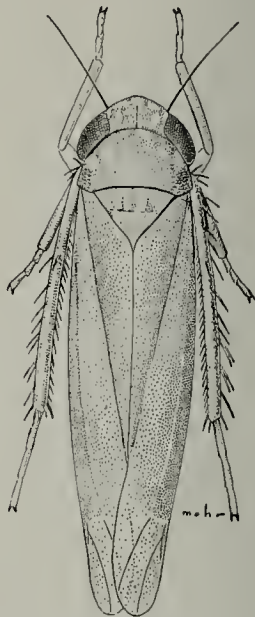


Fig. 508.—*Empoasca fabae*.

p. 317), fig. 510, occurring commonly on apple, and *fabae* (Harris) (1841, p. 186), fig. 511, which occurs on nearly all leguminous plants. The second species is especially a pest of clover, alfalfa, beans, and potatoes, and is frequently abundant on apple. Most of the species of this genus are so closely related that they can be distinguished only by characters of the male genitalia.

#### 116. *IDONA* DeLong

*Idona* DeLong (1931, p. 50).

Figs. 498, 501. The genus may be characterized as having a strongly produced and bluntly pointed vertex. Each hind wing has only one closed apical cell. The crossveins of each elytron are not arranged in a straight line, and the third apical cell is parallel sided. One United States species with two varieties is known. The typical species, *minuenda* (Ball) (1921, p. 23), is greenish in color and resembles some species of *Empoasca*.



117. *JORUMA* McAtee

*Joruma* McAtee (1924, p. 34).

Fig. 503. This genus is characterized by having the hind pair of wings each with one closed and one open apical cell. In contrast to most of the genera of Cicadellinae, this genus has well-developed ocelli. The crossvein that should form the base for the first apical cell is rudimentary.

Two species are known for the United States; at least one of these, *pisca* McAtee (1924, p. 34), may be found in southern Illinois.

118. *CICADELLA* Duméril

*Cicadella* Duméril (1806, pp. 266-7, 334).

*Eupteryx* Curtis (1833, p. 192).

Fig. 505. In general appearance the members of the genus *Cicadella* resemble species of *Typhlocyba*, to which they are closely related. Each hind wing of *Cicadella* has no wing margin; so the four veins extend to the margin, forming three apical cells. In *Typhlocyba* only two apical cells are formed.

About 10 species of *Cicadella* are known for the United States. *C. flavoscuta* (Gillette) (1898b, p. 749) has been taken in small numbers in Illinois. It lives upon ferns in wooded areas. Several other species probably occur here.

119. *TYPHLOCYBA* Germar

*Typhlocyba* Germar (1833, p. 180).

Figs. 496, 506. The species of the genus *Typhlocyba* are for the most part white, cream, or pale in color but often with bright markings. Most of the species feed upon trees and shrubs. These species have a blunt produced vertex, which is scarcely angled, almost rounded, and each hind wing has two open apical cells. The second apical cell of each elytron is triangular, usually with a basal stalk.

About 80 Nearctic species and varieties of this genus are known. Probably the most common and important species in Illinois is the white apple leafhopper, *pomaria* McAtee (1926, p. 29). It is a common pest of apple in the East and Middle West, and at times becomes very abundant, causing a considerable loss of chlorophyll in the leaves.

120. *HYMETTA* McAtee

*Hymetta* McAtee (1919, p. 121).

Fig. 513E. The chief character that separates this genus from *Erythroneura*, to which it is closely allied, is the thickened scutellum and the elevation of its posterior margin. The venational characters of the wing are very close to those of *Erythroneura*.

Eight species and varieties of *Hymetta* have been described for the United States. A common species on shrubbery in wooded areas is *trifasciata* (Say) (1825, p. 344).

121. *ERYTHRONEURA* Fitch

*Erythroneura* Fitch (1851, p. 62).

Figs. 499, 507, 509. This genus contains several hundred minute species of leafhoppers, many of which are pale, with color spots or stripes, or more generally brightly colored, especially with some shade of red. The vertex is produced, bluntly angled, with the apex often rounded. These leafhoppers belong to the group that has no closed apical cells in the hind wing and has two open or incomplete cells formed by three veins extending to the apical margin. *Erythroneura* differs from *Typhlocyba* and *Hymetta* by having the second apical cell quadrate instead of triangular.

Former workers, particularly McAtee (1920), Robinson (1926), and Beamer (1936b, 1946), have divided the species into various groups upon the basis of wing venation, and the following key to groups is based upon their work and adapted from it.

## KEY TO GROUPS

1. Second sector of each elytron joining with the fourth apical vein at crossveins, forming a definite continuous line . . . . . 2
- Second sector of each elytron staggered at crossveins, not joining with the fourth apical vein . . . . . 3
2. Basal crossvein of fourth apical cell oblique . . . . . *maculata* group
- Basal crossvein of fourth apical cell square . . . . . *comes* group
3. Basal crossvein of fourth apical cell curved or sloping; vertex and pronotum marked with two stripes that diverge posteriorly . . . . . *obliqua* group
- Basal crossvein composed of two short veins that are angled with each other, vertex and pronotum usually without divergent stripes . . . . . *vulnerata-kansana* group

### The *obliqua* Group

The species that are allied in this group have a color pattern consisting of oblique reddish lines or a V-shaped mark upon the vertex and pronotum; this pattern may be variously modified in both color and intensity so that a broad dark or reddish stripe may occur on each elytron, forming a rather solid stripe on the middle of the closed elytra. The pygofer hooks of this group are rather short, thick, pointed at the apical ends, each bearing a short process beneath.

The typical coloration of *obliqua* (Say) (1825, p. 342) is yellow, with two red stripes on vertex and pronotum, stripes diverging from apex of vertex. Elytra each with two oblique red stripes, one on each clavus and another on corium close to claval suture. There is also a reddish stripe along costal margin. In one common species, *lawsoniana* Baker (1926, p. 347), the color pattern is such that a broad stripe widens from apex of elytra. This stripe may vary in color from bright red to black. Both of the species mentioned above are commonly found on apple.

### The *vulnerata* Group

The species of this group are all dark colored, with a pale median longitudinal line across vertex, pronotum, and scutellum. The crossveins, and frequently short portions of other veins, are white.

The most common species, *vulnerata* Fitch (1851, pp. 62, 63), is dark greenish, reddish, or brown, with median white line across vertex, pronotum, and scutellum, and a line bordering each eye. The pronotum is marked with white spots. Each of the elytra is marked with white on the clavus and corium. This species is common on grape and other vines.

### The *kansana* Group

This group differs from the *vulnerata* group in color only and can scarcely be considered as a separate group. These species are not dark in color nor do they have the median pale stripe on the vertex, pronotum, and scutellum, but they are variable in color and seem to have no constant character to separate them from that group.

A common species of this group, *kansana* Baker (1925, p. 537), is characterized by

having a dark brown or black scutellum. The vertex varies in color from reddish with pale spots to dusky yellow. The pronotum may vary from yellow with reddish markings anteriorly and brown posteriorly

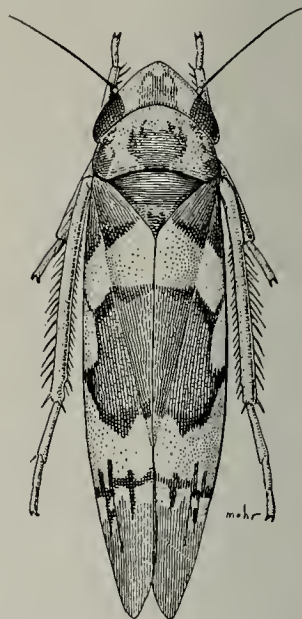


Fig. 509.—*Erythroneura vitis*.

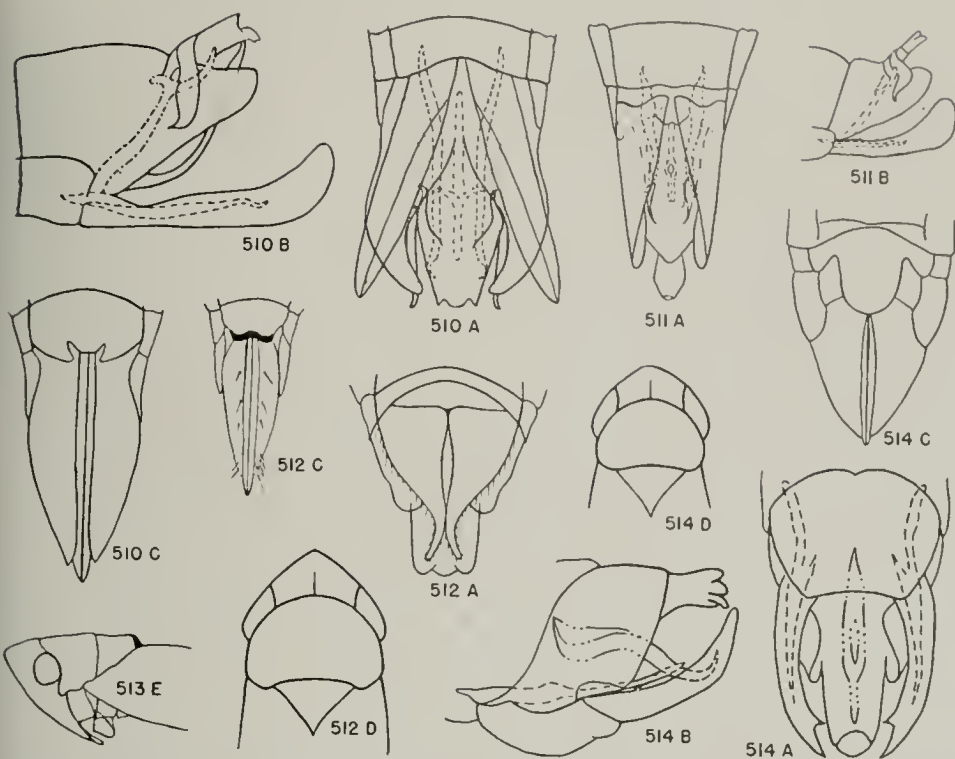
to a dark brown throughout. The elytra are pale, with reddish markings on each clavus, corium, and on crossveins. This species is often common on apple or ornamental plants.

### The *maculata* Group

The species of this group can be separated from those of other groups by a wing character as noted in the key, and in addition the fourth apical cell is always marked by a black spot in basal portion. The pygofer hooks are long and spearlike.

Two color patterns are predominant in this group. The *maculata* type pattern, found in *maculata* (Gillette) (1898b, p. 764), is composed of a yellow or pale background upon which is a rather large number of small red or yellow spots. The other color pattern is either a transverse or oblique band of red or some shade of brown upon a pale background. *E. basilaris* (Say) (1825, p. 344) is a common example of this second group.

*E. maculata* is a common species on wild



Cicadellinae: *A*, ventral aspect of male genitalia; *B*, lateral aspect of male genitalia; *C*, female genitalia; *D*, head and pronotum; *E*, head, thorax, and scutellum, lateral aspect.

Fig. 510.—*Empoasca maligna*.

Fig. 511.—*Empoasca fabae*.

Fig. 512.—*Dikraneura mali*.

Fig. 513.—*Hymetta trifasciata*.

Fig. 514.—*Forcipata loca*.

and cultivated grape, and at times becomes abundant on *Crataegus*. *E. basilaris* is one of the common species on apple and ornamental plants.

### The comes Group

This group is one of the largest of the genus, and the species are rather difficult to separate. As noted, this group has the fourth apical cell with a square base; the second apical cell has either a black spot or a smoky area in its apical portion, and the base of the fourth apical is similarly marked. Pygofer hooks of the male genitalia form U-shaped processes that bear caudally directed processes, the ventral one of which is always longer.

In color the members of the *comes* group vary greatly, and there is no uniform color pattern that can be used in recognizing the

species of this group. Certain species are very pale, either with no markings, as in the case of *delicata* McAtee (1920, p. 317), or with faint markings, which are not easily recognized. Other species, for example *infuscata* Gillette (1898*b*, p. 764), are almost entirely dark brown. Still others are marked with bands or stripes. *E. trilineata* (Fitch) (1851, p. 63) has transverse bands, and *ziczac* Walsh (1862, p. 149) is marked with some rather broad zigzag longitudinal stripes.

*E. comes* (Say) (1825, p. 343), is common on wild and cultivated grape; *ziczac* is common on certain ornamental vines, especially Boston ivy. It also occurs on wild grape, poison ivy, and Virginia creeper. *E. trilineata* is one of the well known and more distinctly marked grape leafhoppers, and it is also found on several of the ornamental vines.



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