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DEPARTMENT OF REGISTRATION AND EDUCATION
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Article 1

The Plant Bugs, or Miridae, of Illinois

HARRY H. KNIGHT



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This paper is a contribution from the Section of Insect Survey.

FOREWORD

THE Miridae, or plant bugs, containing well over a third of the species of the order Hemiptera, have long attracted attention because of their abundance, their diversity of shape and the great variety of plant hosts they attack. Except for a few predacious species, they suck the juices from plant leaves and, with the leafhoppers, aphids and scale insects, rank as one of the most important groups of plant sucking insects in Illinois.

Early in 1930, a project to investigate the Miridae of Illinois and to prepare a comprehensive report on the state fauna was organized. Dr. Harry H. Knight, Iowa State College, Ames, Iowa, was enlisted as leader of the project to direct the initial intensive collecting for the group, identify the material and write the final report, and he was employed by the Survey as Assistant Entomologist during the summers of 1930, 1932, 1933 and 1937 to accomplish these objectives.

Intensive collecting was begun in 1930. Prior to this date much material had been assembled by earlier Illinois collectors, particularly C. A. Hart and C. W. Stromberg, whose specimens in the Natural History Survey collection formed not only a good general collection of the group but also included several species not taken in our recent search. Much interesting material collected in Illinois by W. J. Gerhard was lent us by the Field Museum of Natural History, Chicago.

Field work for this group followed very closely the pattern developed during an earlier study of Illinois aphids (Hottes & Frison 1931). Collecting was done in every part of the state, from south to north, east to west, and repeated at different seasons in an attempt to capture species which might be restricted to certain periods of the year or to limited local habitats. Using known mirid host plants as a guide, we attempted to collect from every species of probable host in every locality visited.

This procedure was followed in 1930 and 1932. In 1931, drought conditions reduced the mirid population to a low ebb, making collecting for this group impractical. In 1934, 1935 and 1936, intensive collecting for leafhoppers turned up many more Miridae, including a large number of new records for Illinois. A total of about 20,000 specimens was accumulated, including the 5,000 specimens already in the collection before our drive for this group began. All members of the Insect Survey Section staff have at various times aided with the field work and preparation of material for identification and preservation.

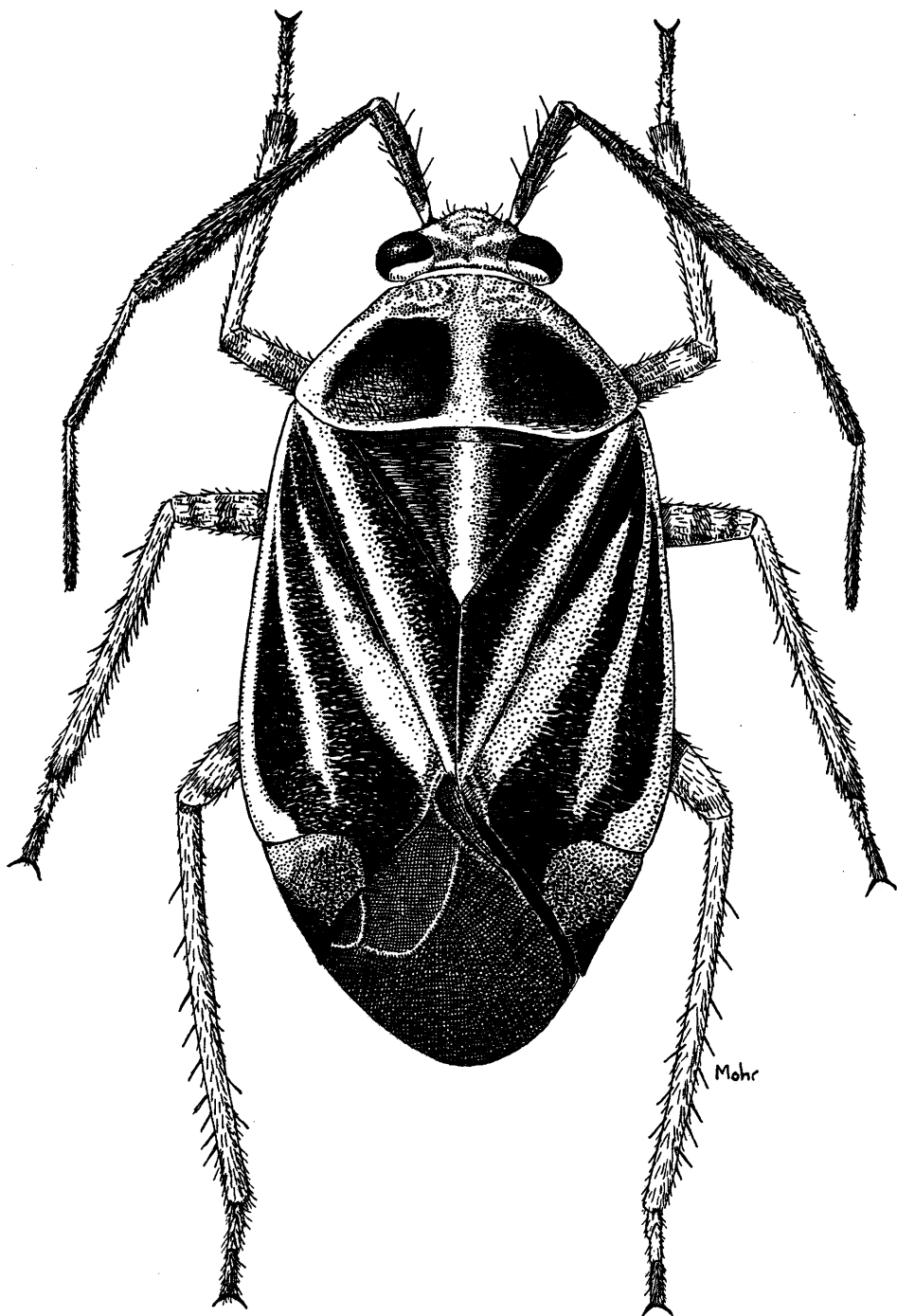
Much of the work of final identification of material and completion of the manuscript was done by Dr. Knight at Ames, Iowa, while not attached to the Survey, and I wish to express our gratitude to him for spending so much of his own time in bringing this project to a successful conclusion.

Several members of our staff in the Insect Survey Section also have contributed greatly to the final manuscript. The many full illustrations of Miridae are with few exceptions the work of Dr. C. O. Mohr, Associate Entomologist and Artist. Dr. Mohr and Miss Kathryn M. Sommerman, Entomological Assistant, also added many illustrations used to illustrate key characters and male genitalia. Summarizing the Illinois collection data and adding it to the manuscript, modification of the keys to emphasize as much as possible characters which could be illustrated, and adapting the manuscript to current Survey practices represent the painstaking and effectual work of Dr. H. H. Ross, Systematic Entomologist, and Dr. B. D. Burks, Assistant Entomologist. The section on economic status and control is in part the work of Prof. W. P. Flint, Chief Entomologist. Finally the manuscript was read and styling determined by the Editor, Mr. James S. Ayars.

T. H. FRISON, *Chief*
Illinois Natural History Survey

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Horcias illini.

Typical in general outline of many plant bugs found in Illinois, but among the more striking in coloration and markings.

The Plant Bugs, or Miridae, of Illinois

HARRY H. KNIGHT*

Introduction

THE list of Miridae of Illinois now stands at 330 species. It is apparent, however, that species known from neighboring states will eventually be found in Illinois. Furthermore, in the study of Illinois species, it was found that many records of these species were a great distance from any other previously known records. Hence, it was thought advisable to include in the keys other species and varieties known from the entire general region in which Illinois is situated. One hundred ten extralimital species were, therefore, included, bringing the total number treated in this report to 440 species. It seems highly probable that from two-thirds to three-fourths of these extralimital species will eventually be found in this state, which would bring the list of Illinois Miridae to about 400 species.

In the list of insects for New York (Leonard 1928),† I recorded 296 species of Miridae, but since publication of this list additional records have raised the total to 316. A list of Miridae for the District of Columbia and vicinity (Knight & McAtee 1929) records 200 species of Miridae within a 25-mile radius of Washington, D. C. The state of Illinois, which includes within its borders the cypress swamps about Cairo and the northern tamarack bogs bordering Wisconsin, represents an ecological range scarcely exceeded by any other state east of the Mississippi River. This range undoubtedly accounts for the large list of Miridae.

In number of species, the Miridae far exceed other families of Hemiptera. In the Palearctic region, where the total number of Hemiptera is best known, the "Oshanin Katalog" (Oshanin 1910) enumerates 1,078

species for the family Miridae and but 2,486 species for all other families of Hemiptera combined. In North America, north of Mexico, approximately 1,500 species of Miridae are known; of other families of Hemiptera, about 2,500 species.

Because of the fragile nature of the pubescence and appendages of the mirids, special attention had to be given to their collection. The collecting party, consisting of two or three members, equipped with nets, bottles, pinning and mounting accessories, and desk lamps, was usually in the field for periods of 10 days to 2 weeks. Each day, collecting was discontinued at about 4 P.M., and headquarters were set up for work in a hotel room where the day's catch was pinned to prevent unmounted insects from being battered in transit.

The collecting party used sweeping nets, each having a ring 15 inches in diameter and a bag of bolter's silk. These were found ideal for mirids, since they excluded so little light from the bottom part of the net that the mirids did not swarm too rapidly to the top. Test-tube cyanide bottles about 6 inches long were used, with the cyanide in the bottom; the diameter of the tube was as large as could be stoppered by the operator's thumb. In each tube were a few loose strands of cellucotton. The bugs were "picked" off the sides of the nets into the bottle, which could be conveniently stoppered by the thumb until emptied.

With this group, care must be taken to have only a small number of individuals in each bottle at one time; otherwise considerable pubescence is rubbed off. After the specimens are dead, they may be transferred to pill boxes or other temporary containers. If mirids are left in the cyanide bottle too long, some of the yellow and orange colors change to deeper tones, sometimes to red.

*Iowa State College, Ames, Iowa; Assistant Entomologist, Illinois Natural History Survey, during summers of 1930, 1932, 1933, 1937.

†Miridae, Isometopidae (Knight 1928b), pp. 110-35.

As mirids are much easier to handle before they have dried out than after, each day's catch was pinned up the following night to insure the best possible specimens. All mirids were mounted on card points with a crimp and in such a way that the crimp

was glued to the side of the mesothorax and not to the legs only. The mounted specimens were then pinned in Schmidt boxes for traveling and taken back to the laboratory at Urbana, where they were labeled and later identified.

Biology

The eggs of most mirids hatch early in the season when the host plants are making tender new growth. It is worthy of note that in the case of species known to produce

nymphal development varies with different species, but many of them are known to require 20 to 30 days. Beginning with the third nymphal instar the development of wing pads may be observed. During the fourth instar the wing pads are clearly evident, while in the fifth instar, fig. 1B, the wing pads usually extend back to the middle of the abdomen. Many mirid species have been observed to possess during nymphal development the curious habit or ability of protruding a posterior portion of the rectum; when a nymph is dislodged and falls from a branch or leaf to the foliage below, the rectum is protruded, and, being provided with sticky material, acts as an adhesion disk upon striking foliage of the limbs below. The nymph then scrambles for a foothold, pulls the adhesion disk free, retracts the rectum and runs for cover among the leaves. Thus the eversible rectal disk saves many falling nymphs from losing contact with the host plant.

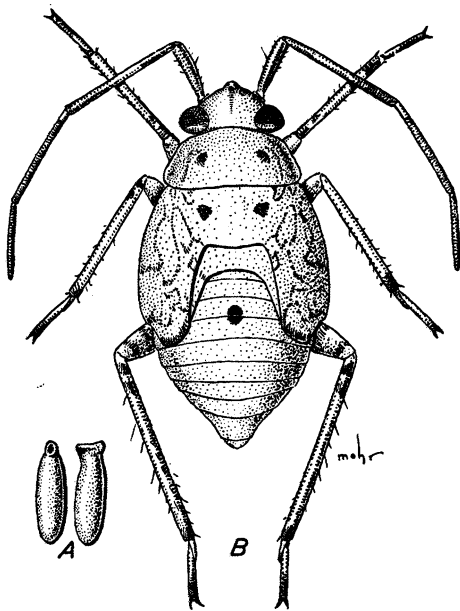


Fig. 1.—*Lygus oblineatus*; A, egg, front and lateral view; B, fifth instar nymph.

a second generation the host plant is one which produces succulent growth during the summer season. Thus, the tiny young nymphs find the maximum amount of sap for food which is essential for plant feeders. Mirid eggs, fig. 1A, are elongate, slightly curved or bean shaped, with a cap and micropyle on the end pointing to the outside of the plant substance where embedded.

Life Cycle

Mirid nymphs pass through five instars or stages of development and at the fifth molt attain sexual maturity and, except in special cases where the adults are wingless, a set of wings. The time required for

The adult females may mate within 2 or 3 days after emergence but do not start laying eggs until a week or 10 days later. The males are generally the first to mature, but they do not live so long as the females.

I have described (1915) in detail the oviposition work of four mirid species but here recount only selected parts. Observations on *Heterocordylus malinus* Reuter were made on crabapple and cultivated apple in western New York. Females that matured June 12 were observed to oviposit on June 21. On the morning of June 23, four different females were observed while ovipositing.

When a female is ready to oviposit she moves up and down the branch, patting the surface with antennae and touching the bark here and there with the tip of the proboscis. In this manner one spent 6 minutes searching for a place to oviposit. Another individual required 15 minutes before she found a suitable place. The female begins to drill the hole by means of the proboscis, and this operation may require from 5 to 18 minutes before the hole is ready for the insertion of

the ovipositor. After drilling the hole with the beak, the female arches the abdomen, stands as high as possible, then unsheaths the ovipositor and thrusts it forward to locate the place prepared. She turns her head under with the tip of the proboscis in the hole to help guide the ovipositor. One female was observed to make seven attempts before inserting the ovipositor. Most individuals make two or three attempts before succeeding. After each failure, the female inspects the hole and works upon it for a time with her beak. Once insertion of the ovipositor is started, the female works the abdomen up and down with a rapid, jerky motion until the ovipositor is inserted to its base. An alternate contraction and expansion of the abdomen then occurs while the egg is being worked down into position. This operation requires about 2 or 3 minutes. The female then withdraws the ovipositor and rests for 3 to 5 minutes before inserting the second egg. After this interval, she again locates the hole by means of antennae and beak and then repeats the operation of inserting the ovipositor. In some cases only one egg is laid in a place, but two eggs appear to be the normal number for this species.

The number of eggs laid varies with the individual from day to day. One female was observed to oviposit in six different places between 10:00 A.M. and 12:00 o'clock noon. This same female was observed to oviposit daily from June 23 to 27, but died on June 28.

The apple redbug, *Lygidea mendax* Reuter, breeds on hawthorn and apple; it matures a week to 10 days later than *Heterocordylus malinus*. In 1914, at Batavia, New York, the majority of females matured about June 20. Several females were watched closely but no eggs were obtained until July 8. When ready to lay, the female moves about over the twigs, searching for lenticels on wood of the previous year's growth. She drills the lenticel by means of the proboscis. One female required 10 minutes for this operation. She failed in three attempts to insert the ovipositor but on the fourth she succeeded. She took 2½ minutes to lay the egg. After an interval of 4 minutes, she returned to the hole and upon the second trial inserted the ovipositor and laid an egg. She then sealed the wound by means of the proboscis. The lenticels are normally light colored but, after being injured by the

process of oviposition, they appear reddish brown. The eggs are placed in the cambium at such an angle that the lower ends rest on solid wood and their tips are 1.5 mm. apart. Females of this species were observed ovipositing on trees in an orchard as late as July 18.

The pear plant bug, *Neolygus communis* Knight, oviposits in the cambium of pear twigs. The actions of the female are very similar to those of the species described

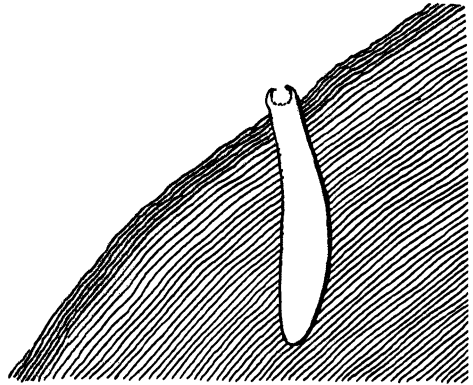


Fig. 2.—Egg of *Paracalocoris colon*, shown in cross section of new growth of apple bark. Adapted from Knight (1915).

above. Examination of one oviposition point revealed that six eggs had been laid in a space 1.0 mm. long. The eggs were closely packed in a double row lying flat just within the cambium layer. Eggs measured were 1.05 mm. in length by 0.26 mm. wide.

An apple mirid, *Paracalocoris pallidulus* McAtee, was found to lay eggs only where dead wood was available. Females that were caged on limbs free from scars and dead stubs did not oviposit. Four females were observed to lay when placed on branches having dead stubs. Five eggs were placed around the margin of one stub, a new hole being made for each egg. The egg of this mirid differs from those of several species at least in having a white cap with two keels that curve up and nearly meet over the top of the egg, fig. 2. The egg cap projects from the cavity as shown in the figure but is not conspicuous because of the uneven character of the rough bark and surrounding wood. Eggs laid in July remain until the following spring before hatching.

A majority of mirid species produce only one generation per year, but a few have been

found to produce two or more generations in one season.

Lygus oblineatus (Say) may produce two or three generations in one season; *Halticus bracteatus* (Say) breeds continuously during the warm season and is credited with five generations in South Carolina. *Adelphocoris lineolatus* (Goeze) rears two generations in a season on alfalfa and sweet clover. *Neoborus amoenus* (Reuter) rears two generations in one summer on white ash. The cotton flea hopper, *Psallus seriatus* (Reuter), breeds continuously as long as the succulent host plants remain green.

Hibernation

A majority of mirid species pass the winter in the egg stage. Usually the eggs are embedded in some part of the host plant. In the hop mirid, *Paracalocoris hawleyi* Knight, the female bugs embed their eggs in the poles used for support of the host vines. The writer observed several females of *Neolygus johnsoni* Knight laying eggs in the soft, punky stubs formed by the breaking off of old dead limbs on the host tree, hornbeam (*Carpinus caroliniana*). Many species, such as *Lopidea davisi* Knight, *Labopidea allii* Knight and *Adelphocoris lineolatus*, lay eggs in stems or leaves of herbaceous plants and pass the winter in the dry stems. The apple redbug, *Lygidea mendax*, *Heterocordylus malinus* and *Neolygus communis* place eggs in the living cambium on branches of the host tree where they pass the winter.

Mirid eggs, fig. 2, have a relatively impervious chorion which permits them to remain viable for several months, although embedded in material which is almost completely desiccated.

Relatively few species hibernate as adults. *Stenodema vicinum* (Provancher) and *S. trispinosum* Reuter are known to do so and no doubt other members of the genus do likewise. Adults of *Lygus oblineatus*, *L. vanduzeei* Knight, *L. plagiatus* Uhler, *L. pabulinus* (Linnaeus), *L. campestris* (Linnaeus) and *L. rubicundus* (Fallen) have all been taken in hibernation, and it seems a characteristic of the genus to overwinter in the adult stage. Species of the subgenus *Camptobrochis* of *Deraeocoris* hibernate as adults, so far as known, with *D. nebulosus* (Uhler), *D. poecilus* McAtee, *D. histrio* (Reuter), *D. nubilus* Knight frequently taken in winter. Here again hibernation ap-

pears to be a group characteristic. *Dicyphus vestitus* Uhler and *D. discrepans* Knight also have been taken in hibernation.

Feeding Habits

Probably a majority of the species of Miridae are plant feeders, but a large number are now known to be chiefly predacious. The predacious habit is only partially developed in certain species and thus insect blood serves merely to supplement the sap obtained from particular food plants. In the genus *Deraeocoris* the different species appear to be chiefly predacious; *D. aphidiphagus* Knight feeds on the elm aphid, *Eriosoma americanum* Riley, and its honeydew; *D. nitenatus* Knight feeds on the woolly apple aphid, *Eriosoma lanigerum* (Hausmann); *D. pinicola* Knight feeds on *Chermes pinicorticis* (Fitch). It seems highly probable that most members of the subfamily Cylapinae are predacious or mycetophagous; namely, species of *Fulvius* and *Peritropis* and *Cylapus tenuicornis* Say; known species of these genera are normally found about dead trees, hiding in crevices of the bark on logs and stumps. In the large genus *Phytocoris*, several species are known to be predacious, particularly the dark-colored, bark-inhabiting ones. Fulton (1918, pp. 93-6) demonstrated that *Pilophorus perplexus* Douglas & Scott feeds freely on apple aphids, three nymphs having reduced a colony of 50 aphids to 6 within 2 days.

Among the plant feeders, probably the greater number of species are limited to a single host, or to a genus of plants, while a very few, such as *Lygus oblineatus* and *Halticus bracteatus* have a wide range of food plants. Even among species which always breed on a single host plant, a general dispersal of individuals usually takes place. Following the time of emergence and mating, individuals of *Tropidosteptes cardinalis* Uhler, *Lopidea staphyleae* Knight and others have been observed to migrate from their host plant to shrubbery in the general vicinity; thence they doubtless become dispersed over wider territory and to new plants, although, in the normal course of their life, they eventually return to suitable growth of the preferred host plant for the purpose of oviposition.

Since a majority of species of Miridae are definitely limited to a single species of plants or at least a genus of plants, we may expect

the distribution of the bugs to be limited to areas where the host species grow. No doubt in times of migration and when buffeted by strong winds, many individual bugs may be carried far from their normal host and hence perish without successful reproduction. It appears that several species of Miridae are so restricted by ecological factors that their distribution is more limited than the host upon which they live. This is certainly true of the apple redbug, *Lygidea mendax*, which normally breeds on species of *Crataegus*; but the *Crataegus* grows far south and west of the areas where *L. mendax* can be found.

While making a close study of *Lygidea mendax* the author noted that the bugs were never found on isolated trees exposed on high ground where the sun was hot and the atmosphere very dry. The bugs seemed to thrive only in valley areas where the humidity rarely dropped to desiccating levels. The nymph of *L. mendax* is very delicate, the body wall evidently only thinly chitinized; so it can live only where the humidity is high enough to prevent desiccation. The writer believes that the southward distribution of this species is limited chiefly by the high

temperatures and desiccating atmosphere frequently encountered west of the Mississippi and south of the Ohio rivers. It seems likely that other Miridae of the Boreal region may have their southern distribution limited for the same reasons.

In contrast to the above, we may take another species, *Heterocordylus malinus*, of which the favorite wild host is *Crataegus*. This insect is more widely distributed than *Lygidea mendax*, for it is frequently found on *Crataegus* in Texas and Mississippi, apparently able to live wherever the host plants thrive. If we examine nymphs of *H. malinus* we find the body wall is more heavily chitinized than in *L. mendax*. The nymphs are not subject to fatal desiccation when the leaves of the host plant wilt under the heat of a hot, dry day. Some years ago the writer reared in breeding cages many nymphs of both species, and at that time first observed the more delicate nature of *L. mendax*. When both species are kept in cages on host plant foliage, and the host leaves are allowed to dry out, *L. mendax* will die immediately whereas *H. malinus* will live for several hours.

Distribution and Habitat Preference*

In Illinois the distribution patterns of the Miridae are linked primarily with those of their plant host species. Other factors also play a very important part in determining mirid distribution patterns, but the influence of these is not always obvious from a study of such a limited area as one state. The greater part of the uncultivated areas of Illinois is covered with either oak-hickory forests or prairie and the various types of community which lead up to them. There are certain restricted areas, however, in which we find mirid hosts found nowhere else in Illinois. These are the result of the rather axial geographic position of Illinois. This state is a long, narrow area, the northern end just bordering some of the coniferous communities which are common in Wisconsin and its southern end extending slightly into conditions typical of the southern states. In respect to east and west, Illinois is the mingling ground of the eastern deciduous forests and the western grasslands, with here and there an invasion of typical western

plants in some of the sand areas. Small areas of peculiar interest are marked on the accompanying maps.

Mirids in Restricted Areas

The tamarack bogs, fig. 3E, are remnants of the glacial bogs. In Illinois they are restricted to the small area in the vicinity of Volo and Antioch in the extreme northeastern portion of the state. They have been encroached upon by agriculture to a considerable extent, but a few remain which have preserved their flora and fauna practically intact. These bogs, fig. 4, are the only place in this state where occurs native tamarack, *Larix laricina*, which is the exclusive host of the following plant bugs in this state: *Deraeocoris laricola* Knight, *Pilophorus uhleri* Knight, *Plagiognathus laricola* Knight. These species do not feed on other species of larch used for ornamental planting in various localities, so that our records for the larch mirids are confined to the northern bogs, fig. 5.

Along the shore of Lake Michigan, north of Waukegan, is a narrow sand area, fig.

*This section is the work of Herbert H. Ross, Systematic Entomologist, Illinois Natural History Survey.

3F, which combines a great variety of grass, sedge, herb and shrub species, many of them found nowhere else in the state. This area offers excellent collecting for some of the rarer species of the Miridae. It combines grass, sedge and herb communities, fig. 6, and open woods with luxuriant herbaceous undergrowth, fig. 7. One of our most interesting captures was *Plagiognathus syrticolae* Knight on the sand-loving willow, *Salix*

syrticola, restricted in Illinois to this area.

White Pines Forest State Park, fig. 3B, in Ogle County, contains an area of white pine forest which is the only large stand of this tree in Illinois, fig. 8. Scattered specimens of the white pine occur in Starved Rock State Park, fig. 3C. Restricted to white pine are four mirid species taken in this state: *Deraeocoris pinicola* Knight, which we have taken only at White Pines

A. THE JO DAVIESS HILLS ARE RICH IN HERB, SHRUB AND TREE SPECIES THAT HARBOR MANY MIRIDAE

B. IN THE WHITE PINES FOREST STATE PARK, CONTAINING THE ONLY LARGE STAND OF VIRGIN WHITE PINE IN ILLINOIS, ARE FOUND MIRIDAE RESTRICTED TO THIS TREE

C. STARVED ROCK STATE PARK HAS SOME WHITE PINE AND OTHER PLANTS UNUSUAL IN ILLINOIS, WITH MIRIDAE PECULIAR TO THEM

D. IN CYPRESS SWAMPS, NOW MOSTLY CLEARED, ARE MIRIDAE AND OTHER INSECTS TYPICAL OF THE SOUTHERN STATES

E. IN THIS LAKE AND MARSH REGION OCCUR TAMARACK BOGS WITH THEIR DISTINCTIVE MIRIDAE

F. THE SAND REGION NEAR BEACH, EXTENDING FROM WAUKEGAN TO WISCONSIN, HARBORS MANY RARE SPECIES OF MIRIDAE

G. LOCALIZED, DENSELY WOODED GLENS IN THESE AREAS HAVE YIELDED MANY RARE MIRIDAE

H. THE OZARK HILLS ABOUND IN CHOICE COLLECTING SPOTS FOR MIRIDAE

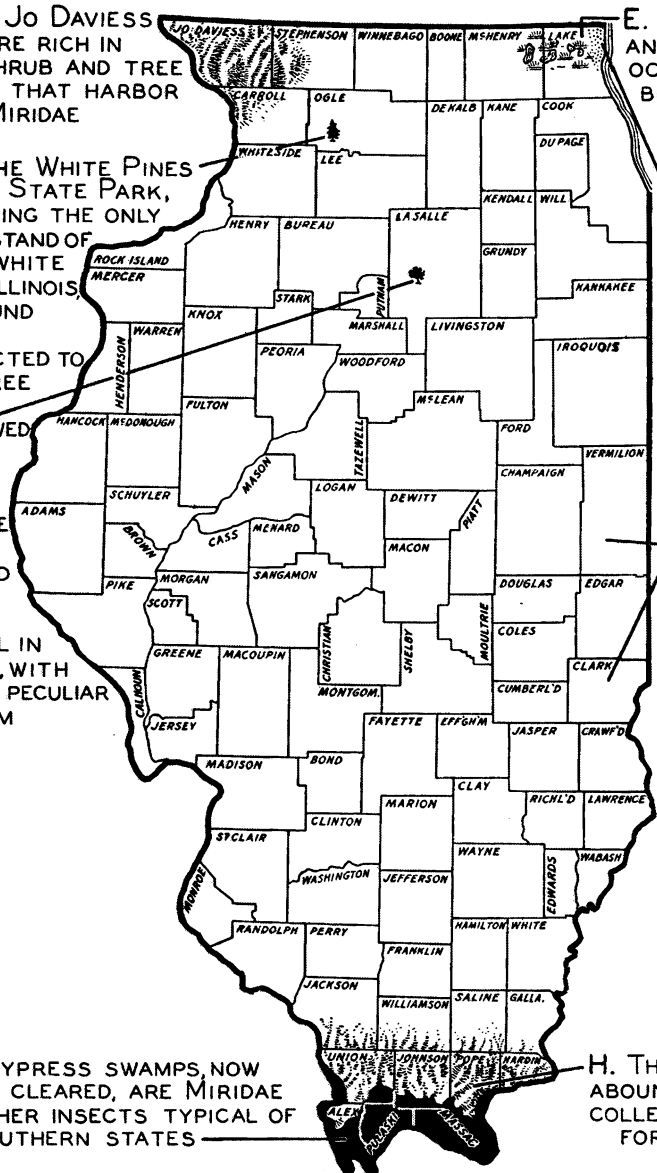


Fig. 3.—Map of Illinois showing mirid habitats of unusual interest.



Fig. 4.—(Above.) Tamarack bog at Volo, Ill. Tamarack is the sole host of three Miridae found in Illinois.

Fig. 5.—(Right.) Map showing the distribution in Illinois of *Pilophorus uhleri*. This species is confined to tamarack, in Illinois found only in the northeastern corner of the state.

Forest State Park; *Deraeocoris nubilus* Knight and *Phytocoris diversus* Knight, which have been taken at both White Pines Forest State Park and Starved Rock State Park; and *Pilophorus strobicola* Knight, which is found not only on these natural stands but also on ornamental white pines throughout the state.

In the extreme southern tip of the state are several fine examples of cypress swamps, fig. 3D. Originally cypress swamps covered an extensive area in Alexander, Pulaski and Massac counties, but most of this has been cut over, drained and put into cultivation. There remain, however, one or two cypress areas which have retained their natural biota, such as at Horseshoe Lake, fig. 9. Cypress in Illinois has yielded the following records of Miridae: *Pilophorus taxodii* Knight, *Parthenicus taxodii* Knight, *Orthotylus taxodii* Knight, *Ceratocapsus taxodii* Knight, *Phytocoris taxodii* Knight. All these species are restricted to cypress and have

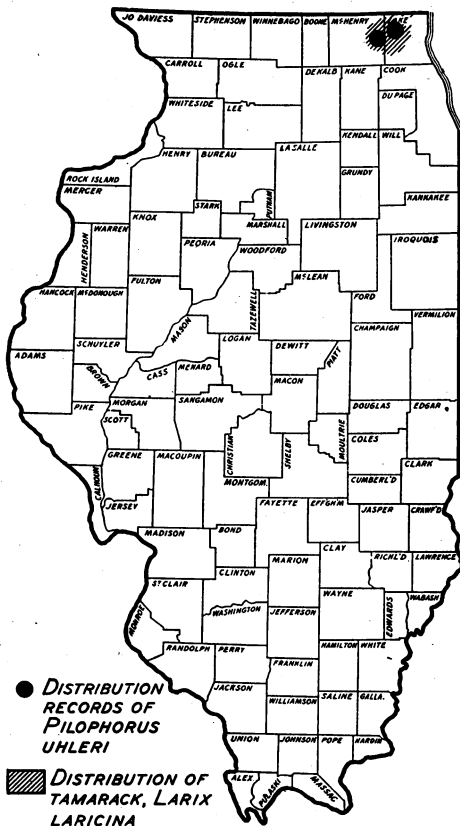




Fig. 6.—Sand prairie vegetation at Beach, Ill., growing on the beaches left by receding Lake Michigan. Note the luxuriant growth of grass and herbs.

been taken in Illinois only in the extreme southern tip, fig. 10.

Forest Mirids

Species of deciduous forest trees, especially ash, oak, hickory and members of the

birch family, serve as host for a wide variety of Miridae the distribution of which in general follows that of our forested areas.

A decided peculiarity of the tree-inhabiting Miridae is their preference for forest-edge conditions. A given species will generally be taken in abundance on only those host



Fig. 7.—Older beaches of the sand prairie area near Zion, Ill. Here the forest-edge conditions, with luxuriant vegetation, offer an ideal habitat for many species of Miridae. This area was formerly one of bare, shifting sand.



Fig. 8.—Edge of the white pine forest at White Pines Forest State Park, Ill. Four species of Miridae are restricted to white pine, three of them to native stands.



Fig. 9.—Cypress along the shore of Horseshoe Lake, northwest of Cairo, Ill. Five species of Illinois Miridae feed only on cypress trees. Another species, *Phytocoris erectus*, has been collected in this state on cypress, but is known to feed not on this tree but on various other, soft-bodied insects that feed on the cypress.

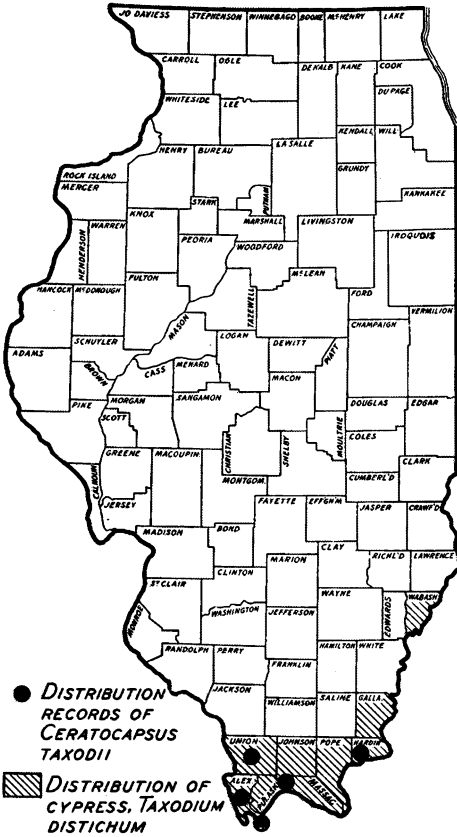


Fig. 10.—Outline map of Illinois showing the distribution of *Ceratocapsus taxodii* and its exclusive host, cypress.

individuals that are at the edge of a clearing, right at the edge of a woods or isolated in the surrounding herbaceous growth. This condition has been found true especially of the species infesting oak and ash. Sweeping in dense woods seldom netted many specimens, but that at odd trees at the edge of the woods frequently resulted in the collection of great numbers of the bugs. This behavior characteristic probably explains why Miridae sometimes become very abundant in street and ornamental plantings of such trees as ash.

Certain forest Miridae are exceptions to this general habit. One of our best examples is *Dicyphus gracilentus* Parshley, which feeds on the herb *Polymnia canadensis*; this bug inhabits deep, shady woods, to which its host is also confined.

We have found collecting of mirids infesting trees and shrubs especially profitable in the Jo Daviess hills, fig. 3A, in extreme

northwestern Illinois, and in the Ozark hills, fig. 3H, in extreme southern Illinois. The Jo Daviess hills are forested and rolling, contain species of *Crataegus* not found farther south and support a flora more varied in nature than most other Illinois areas.

The Ozark hills of southern Illinois are a continuation of the Ozarkian uplift of Oklahoma, Arkansas and Missouri, and have many species of trees, shrubs and herbs that are much more luxuriant there than in other Illinois areas. These species include such forms as alder, red cedar and cane.

Wooded glens especially profitable for mirid collecting occur in several places near the eastern border of the state, fig. 3G.

Grass and Marsh Mirids

Certain groups of Miridae, notably the subfamily Mirinae, feed on grasses and some of the sedges and rushes. Some of these

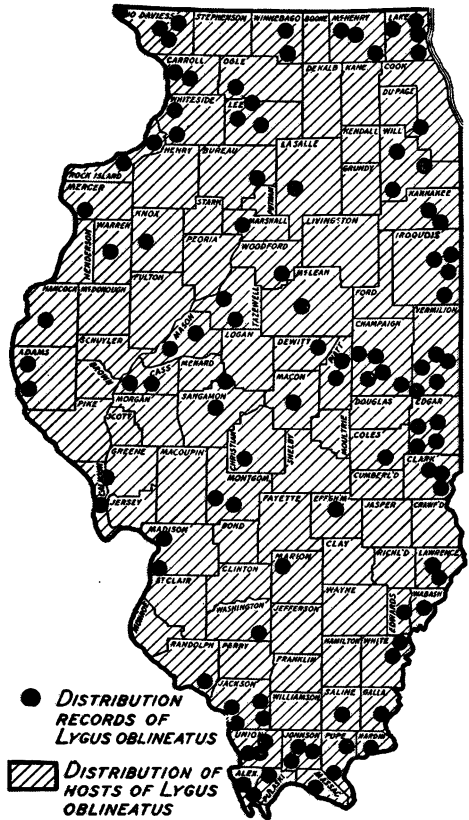


Fig. 11.—Map of Illinois showing distribution of the tarnished plant bug, *Lygus oblineatus*, which feeds on a wide variety of plants.



Fig. 12.—Forest edge near Charleston, Ill. Places such as this, with a large variety of trees and shrubs growing near the forest edge, offer good collecting for many species of Miridae.



Fig. 13.—Meadows and rolling hills near Herod, Ill. Fencerows, forest edge and meadows combine in many localities in the Ozark hills to give excellent mirid collecting. Several species, such as *Plagiognathus gleditsiae* and *Lepidopsallus nyssae*, known previously only from Gulf Coast states, have been collected in the Illinois Ozarks. Other species, typically northern in distribution, have been collected in this state only in the Ozark hills.

species, such as *Miris dolabratus* (Linnaeus) are widely distributed and feed only on grasses. The range of such species extends over most of the state.

Other plant bugs of this subfamily feed on sedges and rushes, as for example, *Mimocleps insignis* Uhler and *Teratocoris discolor* Uhler, and these are restricted to such local areas as have marsh conditions.

In the bog region of northeastern Illinois, we have many marshes which are excellent collecting grounds for these mirids. While these mirids are not restricted to this region, they are found there more frequently and in greater abundance than in other localities of the state. The sand area along the shore of Lake Michigan combines a great variety of grass, sedge and rush species, and offers excellent collecting for some of the rarer Mirinae.

Widely Distributed Species

A number of favorite plant bug hosts grow in almost every locality in Illinois, and include such familiar forms as ragweeds, cocklebur, willows and some of the grasses. In this category are a large number of weeds, herbs and shrubs. Many of the Mir-

idae feeding on these hosts have an equally wide distribution: *Lygus oblineatus* (Say), feeding on a great variety of herbs and shrubs; *Reuterocopus sulphureus* (Reuter), feeding on the cut-leaf ragweeds (*Ambrosia* spp.); *Ilnacora stalii* Reuter, feeding on cocklebur; and many others. The distribution map of *L. oblineatus*, fig. 11, shows the wide distribution of this species and serves as a check map for comparing the distribution of other Miridae.

Collecting Notes

It will be seen from the above that the Miridae inhabit practically all the plant communities in Illinois, showing a preference for areas that are borderline between prairie and forest, and that are in the developmental stages approaching the climax forest.

Profitable collecting for a large variety of plant bug species may therefore be found in the forest edge around clearings, fig. 12, or in country with fields, fencerows and woods intermingled, fig. 13. A second equally profitable type of area is that along small streams where a floodplain forest is growing. In both types of situation, many host species are concentrated in a small area.

Economic Status and Control*

The past 25 years have witnessed a decided increase in the number of Miridae that are recognized as economic pests. These are sucking insects which pierce plant tissues and feed on cell liquids, fig. 14.

One of the Miridae of greatest economic importance in Illinois is the tarnished plant bug, *Lygus oblineatus* (Say). This insect causes serious damage to the peach crop. The adult insects hibernate in the fall and leave their winter quarters early in the spring. They feed on the newly set peaches just at the time when the peach petals have fallen, and they are responsible for the blemish commonly known as catfacing, fig. 15. The area surrounding each feeding puncture in the side of the peach grows very little, and on it ordinary peach fuzz does not develop. The result is that when the peach is ripe there is a bare, sunken area, sometimes as much as a half inch across, in the

side of the peach. Although these blemishes do not affect the quality of the peach very much, they throw the fruit out of grade. In certain years as much as 7 to 8 per cent of all peach fruit in an orchard is affected.

Dusting with very fine sulfur at the time petals are falling has shown some benefits in peach orchards.

This insect also feeds on the new shoots of nursery stock, causing what is called "stopback" or "dieback." It injures a number of fruits by feeding on the buds. The feeding punctures of this species may cause malformation in the flowering buds of asters and strawberries. In orchards the insect may attack the buds and young fruits of apples and peaches. It also feeds on beet, chard, celery, bean, potato, cabbage, cauliflower, turnip, salsify, cucumber, cotton, tobacco, alfalfa, many flowering plants, and most deciduous and small fruits—more than 50 economic plants, besides many weeds and grasses.

The tarnished plant bug is such a general feeder and so widely distributed, and is at

*W. P. Flint, Chief Entomologist, Illinois Natural History Survey and Agricultural Experiment Station, cooperated in writing this section, supplementing it with his knowledge of economic insect control methods in Illinois over a long period of years.

the same time such an active insect, that no satisfactory method of control has been developed.

The garden flea hopper, *Halticus bracteatus* (Say), is a pest of considerable importance on white clover and other leguminous crops in Illinois. In Missouri, it sometimes destroys garden bean crops completely. In South Carolina and neighboring states this tiny bug occasionally destroys 50 to 60 per cent of the alfalfa crop.

The cotton flea hopper, *Psallus seriatus* (Reuter), is a serious pest of cotton, more important in Texas, Oklahoma, Georgia and South Carolina than in Illinois. In some years it is reported as causing greater losses than the boll weevil. Both nymphs and adults of this flea hopper feed on the tiny flower buds of cotton, causing them to drop; the feeding habits of the bugs may also cause the plant to grow tall and spindly, resulting in a light set of cotton squares. This insect may be controlled in cotton fields by fine sulfur dusts. Almost complete freedom from damage may be obtained by the use of these materials. The abundance of this insect is dependent on certain ecological factors, particularly any condition that favors abundant growth of the wild hosts, the various species of *Croton*.

The apple redbug, *Lygidea mendax* Reuter, a potential pest of apples in Illinois, has not yet been found in this state. In parts of the East it is very abundant. Its feeding causes dents or dimples in the apple, and areas of hardened tissue which throw the fruit out of grade. It also damages the apple crop by feeding on small fruit, causing excessive shedding of the apples, with scars and malformed fruit if growth continues. Some infested orchards have had at picking time 25 to 30 per cent of the fruits culled out as a result of malformations caused by the redbug.

This species is easily controlled by adding nicotine sulfate to the pink bud spray or by nicotine dusts, since the nymphs are delicate and very sensitive to these materials, but in Illinois it is not now necessary to put on an application for their control.

The four-lined plant bug, *Poecilocapsus lineatus* (Fabricius), attacks many cultivated plants, such as currant, gooseberry, parsnip, mint and some other truck crops, as well as dahlia and rose. In Illinois, it fluctuates greatly in abundance. In certain years it pays to apply a nicotine dust for its control.

The bright red nymphs puncture leaves and tender shoots, sucking sap; every puncture produces a reddish spot, the leaves curling as the growth of the plant is checked.

The pear plant bug, *Neolygus communis* Knight, may leave its natural host, dogwood (*Cornus* sp.), and colonize on pear trees. The nymphs feed on the small pears, causing



Fig. 14.—Mirid injury. White spots on leaves of ash (*Fraxinus* sp.) are feeding punctures of plant bugs, in this case *Neoborus amoenus*. This type of injury is typical of most mirid feeding.

knotty, malformed fruit. Although the Illinois pear crop is not of great commercial importance, the insect causes an appreciable amount of damage. As is the case with the

tance on cultivated onions in Illinois, but in other states it often becomes so abundant on Bermuda onions that the plants are killed before growth is completed. It is very com-



Fig. 15.—Mirid injury. Catfacing of peaches caused by *Lygus oblineatus*. A similar type of injury by plant bugs is common in various fruits in Illinois.

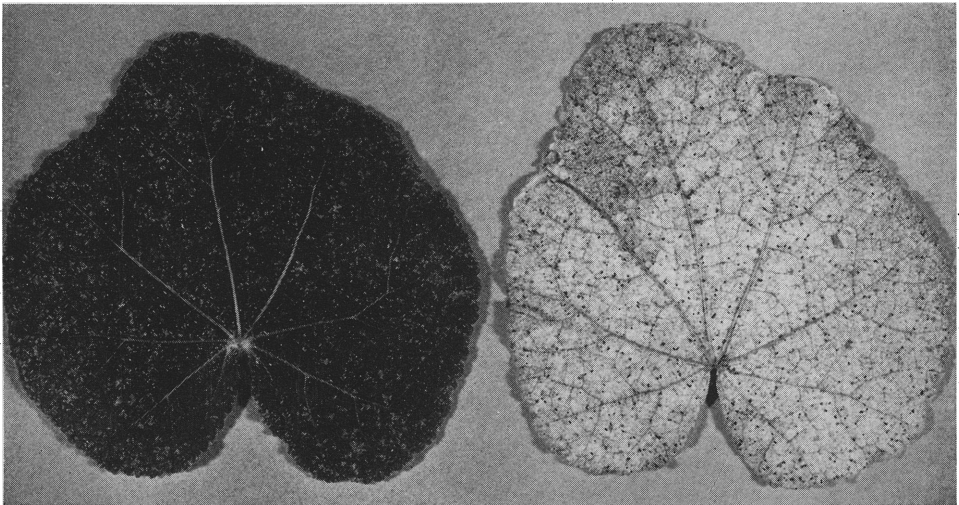


Fig. 16.—Mirid injury. Extreme injury to hollyhock foliage by the plant bugs *Melanotrichus althaeae* and *Halticus bracteatus*. Note in leaf at right almost complete etiolation or destruction of green coloring matter, caused by feeding of these bugs. Similar damage frequently occurs on grasses, onions, phlox, clover and other plants by various mirid species.

tarnished plant bug, no really satisfactory method of control under Illinois conditions has been developed.

Brittain (1917) describes serious injury to apples in Nova Scotia by the green apple bug, *Neolygus communis* var. *novascotiensis* Knight.

The onion plant bug, *Labopidea allii* Knight, is not usually of any great impor-

mon on wild onions and wild garlic, but perhaps may be considered a beneficial insect in this respect rather than a plant pest.

The phlox plant bug, *Lopidea davisii* Knight, breeds on wild phlox but is often found colonizing on cultivated phlox and causing serious injury to these ornamental plants. The bug can be controlled by the use of a nicotine spray or dust, or by pyrethrum

sprays or dusts. It is an insect that should be looked for every year.

The hickory plant bug, *Neolygus caryae* Knight, may migrate from its natural host to peach trees, where the adults puncture and suck sap from the young fruit. It causes some injury to peaches, which is similar to that of the tarnished plant bug. Serious damage by this insect has been reported from New York and Ohio.

In several western states the legume bug, *Lygus hesperus* Knight, causes considerable loss in alfalfa seed due to puncturing and feeding by the bugs on the flower buds. The pale legume bug, *L. elisus* Van Duzee, does similar damage, but in most localities this

species is outnumbered by *L. hesperus*. In the upper Mississippi River valley the alfalfa plant bug, *Adelphocoris lineolatus* (Goeze), is extremely abundant on alfalfa and sweet clover and may prove to be a pest where these crops are grown for seed production.

Other species of Miridae that are from time to time reported as pests are hop plant bug, *Paracalocoris hawleyi* Knight, on hops; hollyhock plant bug, *Melanotrichus althaeae* (Hussey), fig. 16; meadow plant bug, *Miris dolabratus* (Linnaeus), on timothy and other grasses; and the rapid plant bug, *Adelphocoris rapidus* (Say), on cotton in the South.

Taxonomy

The Miridae are distinguished by four-segmented antennae, a four-segmented rostrum of which the first segment is as long as or longer than the head, three-segmented tarsi (except *Peritropis* in which they are two-segmented), wing membrane with only two cells or areoles, one longitudinal vein (anal vein), a well-developed cuneus on the wing, and by absence of ocelli, fig. 17. The four-segmented antennae are usually slender, nearly linear or the second segment only slightly thickened apically, but in a few genera strongly thickened as in *Capsus*, *Atractotomus* and *Teleorhinus*; third and fourth segments usually slender but in some forms distinctly thickened as in *Ceratocapsus*. The hemelytra are typically separated into clavus, corium, cuneus and membrane, the embolium usually not clearly separated from corium; veins of membrane forming two cells, a small and larger areole; however, in a number of species the hemelytra may be abbreviated (brachypterous), the membrane almost absent or reduced to a narrow band with veins poorly indicated. Modifications of the arolia, the pulvillaelike structures between the tarsal claws, furnish the most reliable characters for separating the subfamilies.

In general, the Miridae are small to medium in size, from 2.0 to 9.5 mm. in length, usually rather fragile, broader than high and longer than broad; as viewed from above, ovate to oblong, but in a few genera rather slender, as in *Trigonotylus*. The male is usually more slender than the female. The body is variously clothed with fine hairs or pubescence, sometimes modified

to form sericeous or scalelike hairs, which are easily shed; frequently the dorsum is practically glabrous and strongly shining. The numerous species exhibit the greatest variety of color patterns, ranging from the most obscure to forms that are vivid red. Color varieties within the species are frequent, and the two sexes are more often differently colored, the male usually darker colored than the female.

Brachypterous and apterous forms occur throughout the family, and individuals of a single species may exhibit variation in this respect, as in *Halticus bracteatus* (Say) and *Miris dolabratus* (Linnaeus). Usually the male is macropterous even when the female is apterous, but in rare cases the male may be apterous. Ant mimic forms are rather numerous among the Miridae, especially in species of *Coquillettia*, *Sericophanes* and *Pilophorus*. In such forms the abdomen is constricted at the base while the head and thorax are so modified the resemblance to ants is unmistakable. The species of *Sericophanes* and *Coquillettia* are generally found upon the ground running about among ants, but the biological relationship, if any, has not been determined. In Iowa the writer has found *Sericophanes heidemanni* Poppius rather abundant on the ground among short grasses and weeds of closely cropped pasture land; the bugs running about where the little brown ants, *Lasius niger alienus* var. *americanus* Emory, were very abundant. At Fort Snelling, Minnesota, in an area of little disturbed, high, prairie vegetation, particularly among the shorter grasses, the writer found and collected a large series of *Coquil-*

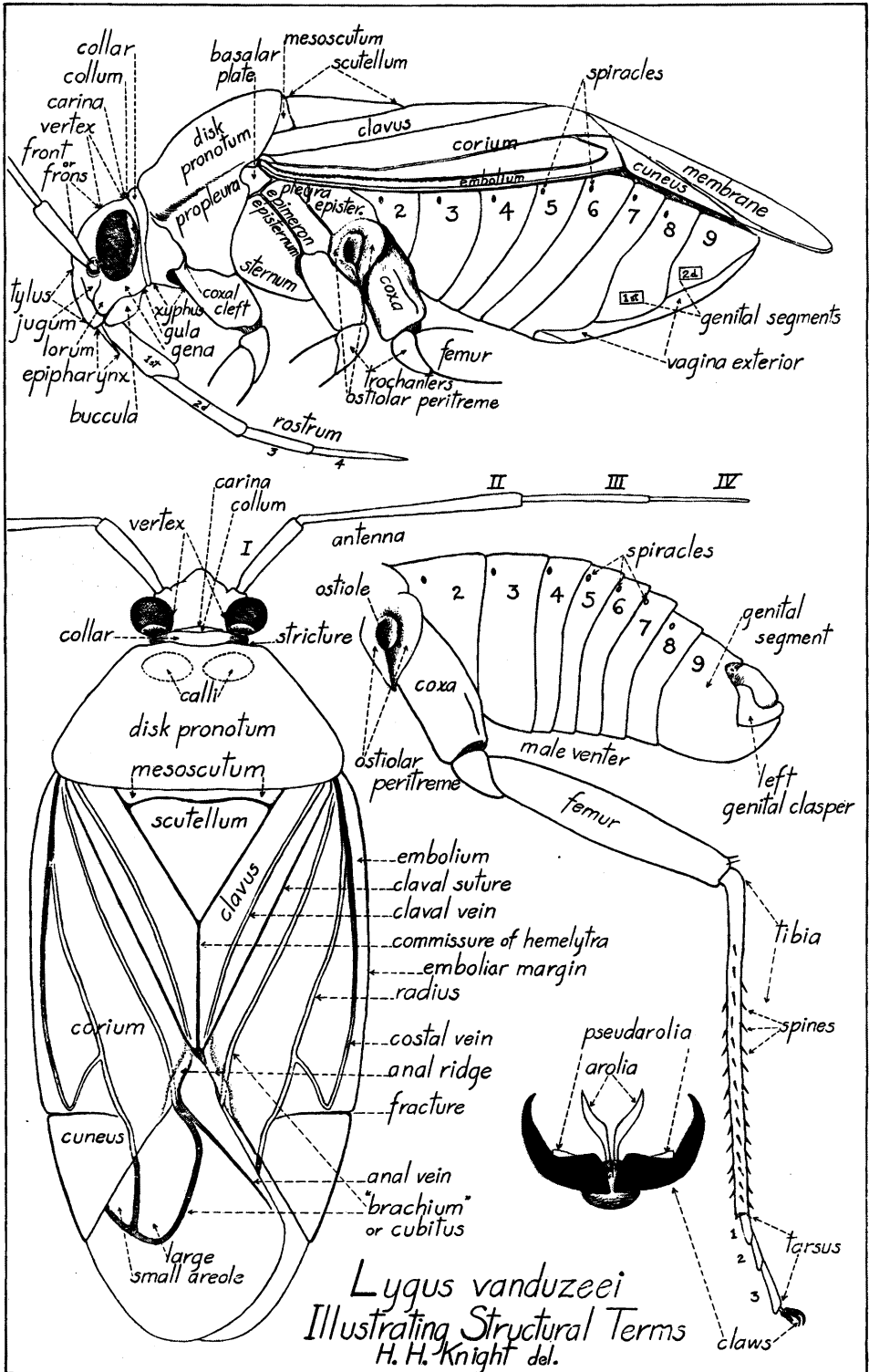


Fig. 17.—*Lygus vanduzeei*, showing typical mirid structures and illustrating structural terms.

lettia amoena (Uhler) from an area which abounded with the ant, *Formica* (*Neoformica*) *pallide-fulva* var. *incerta* Emory. The wingless females so resemble this ant in form and color that one must look rather closely to separate them. Miridae of the above species of *Sericophanes* and *Coquillettia* are extremely agile and very rapid of movement, especially when they happen to meet face to face with ants. While they seem not to fear the ants, they appear to avoid close contact with them.

Systematic Characters

The most important character for separation of subfamilies is found in the structure of the arolia, situated between and at the base of claws, fig. 17. In the subfamilies Phylinae and Deraeocorinae the arolia are represented by a pair of erect bristles that are difficult to see in the smaller species. The arolia are erect and well developed in the Orthotylinae, Mirinae and Capsinae; arolia converging at tips in Orthotylinae and diverging apically in the Mirinae and Capsinae. Pseudarolia are clear to white in color and occur on inner curvature of claw near base. The pseudarolia are found in the Phylinae but are larger and more prominent in the Dicyphinae and Bryocorinae.

The form of the male genital segment is rather distinctive in the subfamily Phylinae; the genital claspers are relatively small, with tip of right clasper resting in a notch across the middle of the V-shaped left clasper; both oedagus and claspers are twisted somewhat to the left side. The author believes this particular form of genital segment is a fundamental character of this subfamily. In other subfamilies the male genital segment often presents good characters for the separation of genera as well as species. Specific differences are more likely to be found in the male claspers, which are asymmetrical in form and differ among the species in many genera. It is fortunate that in several of the largest genera the numerous species may be identified by the form of the genital claspers, as in *Phytocoris*, *Neolygus*, *Lopidea*, *Orthotylus*, *Ceratocapsus* and *Deraeocoris*. On the other hand, in several sizable genera such as *Paracalocoris*, *Neurocolpus* and *Neoborus* the male genital claspers appear to be of little value for distinguishing species. Fortunately, in *Paracalocoris* and *Neurocolpus* the length of antennal segments and

form of pubescence offer very good characters for separating species. Thus it appears that a particular set of characters may not have equal value throughout the family.

Among the Miridae, pubescence often provides useful characters; it varies from simple, fine hairs, erect or recumbent, to silky, slightly curled pubescence, or even flattened, scalelike hairs. The scalelike pubescence found on several species of *Phytocoris* and in the genus *Halticus* is easily shed or lost; hence specimens should be collected and preserved with great care.

The shape of the head and thorax is much used for generic characters; minor differences may indicate species. The length of the rostrum may be of generic value but more frequently it differs among the species and may form good distinctions, as in *Polymerus* and *Lygus*. The antennae are generally linear in form with the last two segments very slender. However, some genera may be separated by the exceptional form of the different segments; the second segment is strongly thickened in *Capsus*, *Atractotomus* and *Teleorhinus*; the third and fourth segments are usually slender, but in some genera, as *Ceratocapsus*, they are distinctly thickened.

Phylogeny

Nine subfamilies of Miridae are recognized from North America and all of them are found in the state of Illinois. The

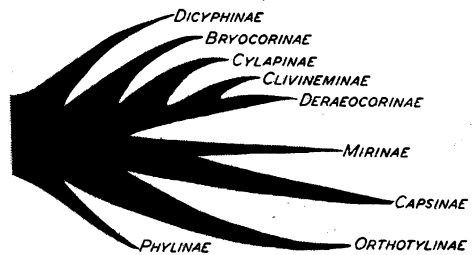


Fig. 18.—Genealogical tree showing relationship of mirid subfamilies.

phylogeny of these subfamilies does not present a linear series of development, but more of a progression upward in several directions, which perhaps may best be represented by a genealogical tree, fig. 18, to express the relationships within the family. These relationships are based on the following characters, which are listed in the order of their relative importance: (1) arolia, (2)

genital structures, (3) biology, (4) modifications of the thorax.

The position and height of the tree branches indicate the evolutionary relationships of the subfamilies, while the width of the branches indicates the relative number of species. For instance the Mirinae are highly developed structurally but very old and decadent in number of species; the genera and species are few in number but most of them are very widely distributed. The host plants of the Mirinae are confined to the grasses and sedges, families that are among the oldest and most widely distributed plant groups. On the other hand the Capsinae are more recent in development, structurally more specialized with arolia and genital structures highly developed; the species are very abundant, often limited in distribution, and for host plants utilize all the more recent plant families. Species of the subfamily Orthotylinae resemble the Phylinae most by absence of the thoracic collar, but the erect incurved arolia come nearest in form to the Capsinae; the genital claspers are highly modified and specialized.

Present Holders of Material: Symbols

If not otherwise noted the material listed in this paper belongs to the Illinois Natural History Survey. Material in the collections of other institutions or individuals is so designated by the use of the following symbols.

FM—Field Museum of Natural History, Chicago, Ill.

KC—Knight Collection, Iowa State College, Ames, Iowa.

UI—University of Illinois, Urbana, Ill.

USNM—United States National Museum, Washington, D. C.

Measurements and Records

Measurements given in this paper, *e.g.*, "length 5.80, width 2.48," are uniformly in

millimeters. These are standard with other literature on insect taxonomy.

In any previously described species in which more than 10 Illinois records are available, the places are listed and the dates summarized.

Tarsal Claw Key Characters

The student wishing to identify Miridae should acquaint himself with the structures of the tarsal claws. These claws are used in identifying most of our forms to subfamily and sometimes to genus. It is highly desirable that the student examine a selection of different kinds of mirids to acquaint himself with the various conditions of the arolia and pseudarolia on the tarsal claws.

The claws are best examined at high magnifications against a dark background. If possible, it is well to examine them with both compound microscope and stereoscopic binocular.

The tarsal claws are situated at the extreme end of the third tarsal segment, fig. 23. The simplest type is shown in fig. 24, which has a pair of hairlike arolia arising from the area between the base of the claws. In some groups, these arolia are membranous and thickened; in such cases, they are either convergent at apex, fig. 25, or divergent at apex, fig. 26. These two membranous types are generally readily visible without any doubt as to their structure. In other groups are cushionlike or flaplike membranous areas called pseudarolia attached to the claw itself. These may be very small; they may be present in instances where the arolia are either hairlike or membranous. In Illinois species, they are never large if the arolia are membranous. Among the species in which the arolia are hairlike, these pseudarolia are often quite large. Fig. 27 shows an example in which the pseudarolia are large and joined to the claw over a large surface; figs. 28 and 29 illustrate an example in which the pseudarolia are flaplike and attached to the claw only at its base.

KEY TO SUBFAMILIES

- 1. Scutellum with a dorsal projection, figs. 137, 181..... 2
- Scutellum without a dorsal projection. 3

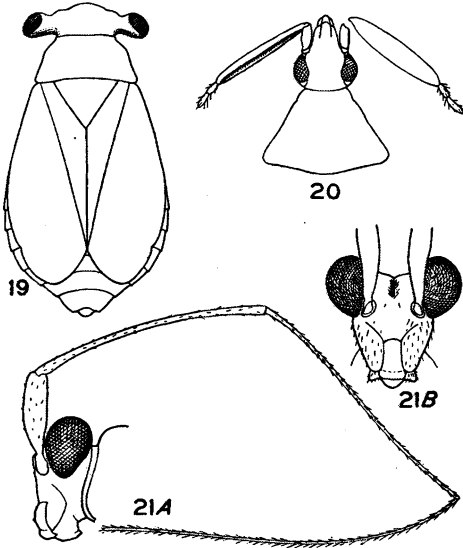


Fig. 19.—Head and body of *Labops hirtus*.

Fig. 20.—Head and pronotum of *Hesperophylum heidemanni* showing dorsal view of antenna at left, anterior flat view at right.

Fig. 21.—Head of *Cylapus tenuicornis*: A, lateral view; B, dorsal view.

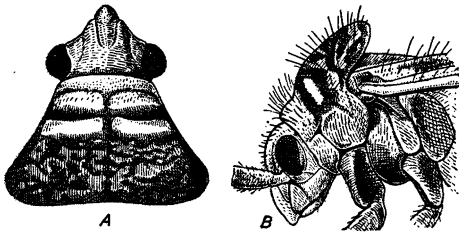
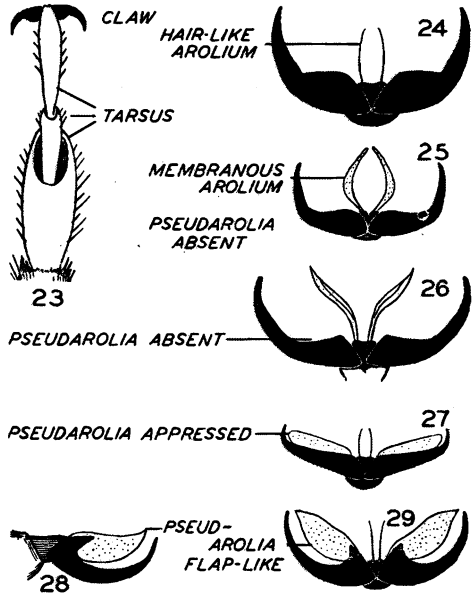


Fig. 22.—Head and pronotum of *Semium hirtum*: A, dorsal view; B, lateral view.

- 2. Pronotum with anterior half flat, posterior half swollen, fig. 181 (*Barberietta*, p. 209).... **Capsinae**, p. 131
- Pronotum with only anterior fifth flat, posterior four-fifths forming a high, swollen area, fig. 137 (*Cyrtopeltocoris*, p. 117)..... **Orthotylinae**, p. 74
- 3. Eyes attached to a stalk formed by a round lateral projection of head; head very wide and short, fig. 19..... **Labopini**, p. 81

- Eyes not stalked, figs. 20, 113..... 4
- 4. Eyes rising a considerable distance above dorsum of head; head deep, with a furrow down the meson and the ventral margin wide and truncate, fig. 21..... **Cylapini**, p. 61
- Eyes not rising appreciably above dorsum of head..... 5

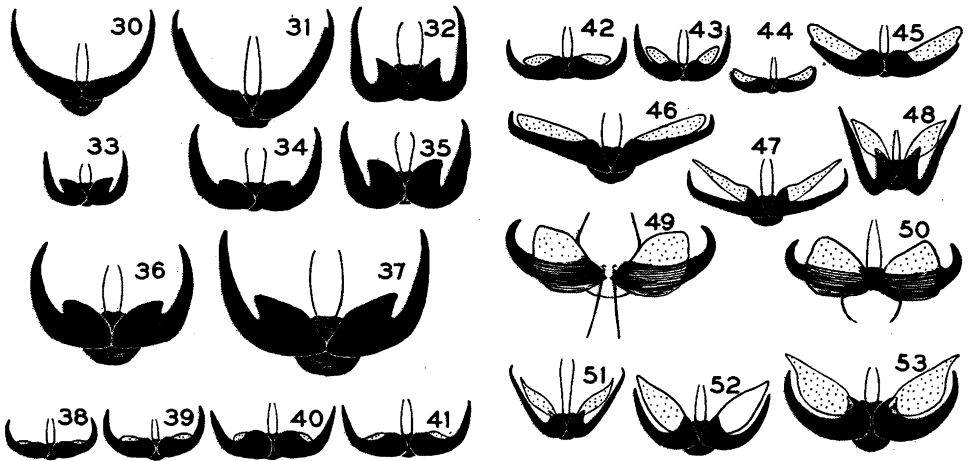


MIRID TARSAL CLAWS

- Fig. 23.—*Monalocoris filicis*.
- Fig. 24.—*Largidea davisi*.
- Fig. 25.—*Diaphnidia pellucida*.
- Fig. 26.—*Pithanus maerkelii*.
- Fig. 27.—*Teleorhinus davisi*.
- Fig. 28.—*Dicyphus agilis*.
- Fig. 29.—*Dicyphus agilis*.

- 5. Pronotum as in fig. 22, with anterior fourth membranous, remainder velvety and dark, with a pair of conspicuous, narrow membranous areas near anterior margin of dark portion; pleural area separated from notum by a suture (*Semium*, p. 75)..... **Orthotylinae**, p. 74
- Pronotum otherwise, without a pair of narrow, membranous areas on a velvety area; seldom with a suture separating pleural areas and notum. 6
- 6. Antennae with second segment bilaterally compressed, foliaceous, nearly

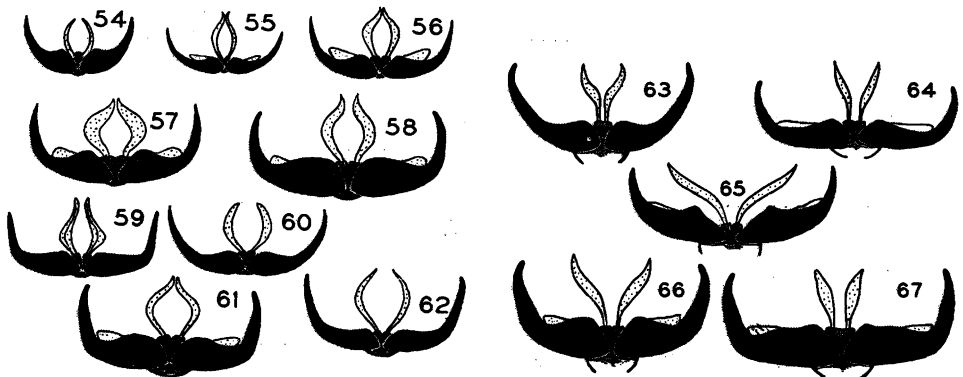
- three times as high as wide, and black; third and fourth segments very short, fig. 20 (*Hesperophylum*, p. 19).....**Deraeocorinae**, p. 64
- Antennae with second segment cylindrical or almost so, or third segment three-fourths as long as second, fig. 92..... 7
7. Tarsal claws with only a pair of straight hairs between them, figs. 30-41, sometimes also with a small, inconspicuous, membranous area appressed to inner margin of claw, figs. 38-41.....13
- Tarsal claws with a pair of prominent, whitish, membranous lobes between them; these lobes either curved and fingerlike, figs. 54-67, or flaplike, figs. 42-53..... 8
8. Tarsal claws with membranous lobes fingerlike and arising from between bases of claws (true arolia); these either divergent, figs. 63-67, or convergent, figs. 54-62, at apex..... 9
- Tarsal claws with membranous lobes flaplike (pseudarolia), arising from inner margin of claw itself, figs. 42-53; frequently hooked to form a recess from which the pseudarolia appear to arise, fig. 52.....18
9. Arolia convergent at apex, figs. 54-62.....**Orthotylinae**, p. 74
- Arolia divergent at apex, figs. 63-67... 10
10. Pronotum with a prominent ridge running from the postero-lateral corner of the pronotum almost to the anterior corner, fig. 69; and with pleural suture situated some distance from anterior margin and terminating under ridge.....**Mirinae**, p. 124
- Pronotum with this ridge either absent or represented for only a short distance.....11
11. Posterior portion of head elongate, fig. 143, so that the eyes are situated their own length from pronotum (*Collaria*, p. 126)....**Mirinae**, p. 124
- Posterior portion of head short so that the eyes almost touch or do touch the pronotum, fig. 154.....12
12. Pronotum markedly widest at posterior margin, figs. 155, 180; hemelytra with corium and cuneus distinctly defined as sclerotized areas and set off from the apical membrane.....**Capsinae**, p. 131
- Pronotum swollen at middle, this portion as wide as or wider than hind margin, fig. 142; hemelytra with corium and cuneus merging so imperceptibly with the membrane, which is partially sclerotized, that there is no line of distinction between them; includes both macropterous and brachypterous forms.....**Mirinae**, p. 124
13. Calli greatly enlarged into a pair of broad humps occupying the anterior two-thirds of the central area of the pronotum, fig. 68....**Fulviini**, p. 61
- Calli much smaller, fig. 70; pronotum not humped anteriorly, but usually considerably humped posteriorly...14
14. Anterior margin of pronotum with a distinct, even, ringlike collar set off by a definite, deep groove, fig. 70...15
- Anterior margin of pronotum without a ringlike collar, fig. 77; at most with a flattened area, fig. 78.....17
15. Pronotum narrowed to a distinctly necklike anterior portion; head narrowed posteriorly and appearing stalked; hemelytra colorless, transparent and glassy with a Y-shaped red or fuscous mark, fig. 98 (*Hyaliodes*, p. 57).....**Dicyphinae**, p. 52
- Pronotum not greatly narrowed anteriorly, figs. 70, 71; head sometimes narrowed posteriorly but not stalked, fig. 71; hemelytra not colorless and glassy.....16
16. Eyes distinctly removed from posterior margin of head, fig. 71; pronotum with calli represented by a smooth, depressed shining area forming a second "collar," fig. 71.....**Clivinemini**, p. 64
- Eyes bordering on posterior margin of head, figs. 70, 105; pronotum with calli not depressed below level of adjacent area of pronotum.....**Deraeocorinae**, p. 64
17. Anterior portion of pronotum set off by a dark, impressed line running from antero-lateral corner to posterior margin of calli, fig. 72.....**Largideini**, p. 63
- Anterior portion of pronotum without such a line, figs. 77, 79.....**Phylinae**, p. 22
18. Dorsal outline almost circular, fig. 99, and pronotum with narrow, ringlike



MIRID TARSAL CLAWS

- Fig. 30.—*Fulvius brunneus*.
 Fig. 31.—*Cylapus tenuicornis*.
 Fig. 32.—*Hyaliodes vitripennis*.
 Fig. 33.—*Deraeocoris nebulosus*.
 Fig. 34.—*Deraeocoris pinicola*.
 Fig. 35.—*Deraeocoris ruber*.
 Fig. 36.—*Eurychilopterella luridula*.
 Fig. 37.—*Eustictus venatorius*.
 Fig. 38.—*Microphyllellus modestus*.
 Fig. 39.—*Psallus ancorifer*.
 Fig. 40.—*Rhinocapsus vanduzeei*.
 Fig. 41.—*Criocoris saliens*.

- Fig. 42.—*Microsynamma bohemani*.
 Fig. 43.—*Reuteroscopus ornatus*.
 Fig. 44.—*Chlamydatus associatus*.
 Fig. 45.—*Lopus decolor*.
 Fig. 46.—*Orectoderus obliquus*.
 Fig. 47.—*Coquillettia mimetica*.
 Fig. 48.—*Dicyphus famelicus*.
 Fig. 49.—*Pycnoderes dilatatus*.
 Fig. 50.—*Sixeonotus insignis*.
 Fig. 51.—*Dicyphus discrepans*.
 Fig. 52.—*Macrotylus sexguttatus*.
 Fig. 53.—*Macrolophus separatus*.



MIRID TARSAL CLAWS

- Fig. 54.—*Parthenicus vaccini*.
 Fig. 55.—*Halticus bracteatus*.
 Fig. 56.—*Halticus intermedius*.
 Fig. 57.—*Strongylocoris stygius*.
 Fig. 58.—*Heterocordylus malinus*.
 Fig. 59.—*Ceratocapsus modestus*.
 Fig. 60.—*Labops hirtus*.

- Fig. 61.—*Ilnacora malina*.
 Fig. 62.—*Orthotylus flavosparsus*.
 Fig. 63.—*Stenodema trispinosum*.
 Fig. 64.—*Phytocoris lasiomerus*.
 Fig. 65.—*Barberrella apicalis*.
 Fig. 66.—*Lygus vanduzeei*.
 Fig. 67.—*Platytylallus insitiosus*.

- collar well marked, fig. 73 (*Monalocoris*, p. 58)..... **Bryocorinae**, p. 58
- Either dorsal outline much more elongate, fig. 97, or pronotal collar absent, fig. 77..... 19
19. Tibiae without spines, only hair. Short, robust species, figs. 100, 101, with the pronotum greatly swollen posteriorly and the areole demarked by a single, angulate, thick vein (*Sixenotus*, p. 59, and *Pycnoderes*, p. 60)..... **Bryocorinae**, p. 58
- Tibiae with spines which project beyond hair, fig. 17; either more elongate, slender species, fig. 97; or pronotum only moderately enlarged posteriorly, fig. 87; or areole divided into large and small parts, fig. 17... 20
20. Pronotum wide, without collar or collarlike area, figs. 77, 87..... **Phylinae**, p. 22
- Pronotum narrower, anterior portion somewhat necklike, with a collar or collarlike flat area, figs. 78, 97..... 21
21. Hind tarsi very long and slender, fig. 74; second segment very long, claws small..... **Dicyphinae**, p. 52
- Hind tarsi stouter, figs. 75, 76; second segment not much longer than third. 22
22. Hind tibiae with a few black spines at apex, fig. 76; tarsal segments robust; tarsal claws long, figs. 46, 47, sharply curved at extreme apex..... **Phylinae**, p. 22
- Hind tibiae with no black spines at apex, fig. 75; tarsal segments bilaterally compressed; tarsal claws short, figs. 52, 53, evenly curved from base..... **Dicyphinae**, p. 52
- ing almost to hind coxae; hemelytra fully developed in both sexes..... **Teleorhinus**, p. 52
- Second antennal segment linear or slightly thickened at apex, fig. 80; beak reaching middle coxae; females brachypterous or wingless..... 3
3. Second antennal segment linear; pseudarolia attached at base of claw, free apically, fig. 47; females wingless..... **Coquillettia**, p. 52
- Second antennal segment slightly thickened at apex, fig. 80; pseudarolia completely jointed to claw, fig. 46; females brachypterous..... **Orectoderus**, p. 52
4. Cuneus white or very light yellow, with transverse black bar across middle; membrane dark brown or black, with prominent white marginal spots, fig. 93; pseudarolia large, attached only at basal angles and extending free and parallel with claws to tips, fig. 52..... **Macrotylus**, p. 51
- Wings not marked as in fig. 93; pseudarolia large and completely united with claws, fig. 46; or pseudarolia minute or wanting, figs. 38-43.... 5
5. Vertex and pronotum bearing silvery, scalelike hairs, these hairs sometimes in tufts..... 6
- Vertex and pronotum not bearing silvery, scalelike hairs..... 11
6. Head transverse, front vertical, not protruding in front of antennal bases as seen from dorsal aspect..... **Rhinacloa**, p. 50
- Head produced in front of antennal bases, fig. 89..... 7
7. Tylus sharply produced, apex acute, fig. 91..... **Criocoris**, p. 49
- Tylus not produced, apex blunt:.... 8
8. Second antennal segment strongly thickened.... **Atractotomus**, p. 51
- Second antennal segment linear, not thicker than first segment..... 9
9. Length of second antennal segment less than width of head across eyes..... **Lepidopsallus**, p. 46
- Length of second antennal segment greater than width of head across eyes..... 10
10. Pseudarolia attached only at base of claw, tip free and extending to middle of claw, fig. 43; color green-

PHYLINAE

KEY TO GENERA

1. Pronotum nearly triangular with a more or less flattened apical collar, but this collar not set off from disk of pronotum by a distinct carina, fig. 78; abdomen usually constricted at base, as in fig. 136..... 2
- Pronotum wider without a flattened apical collar, figs. 77-79; abdomen never constricted at base..... 4
2. Second antennal segment strikingly clavate, its thickness at apex more than twice that at base; beak reach-

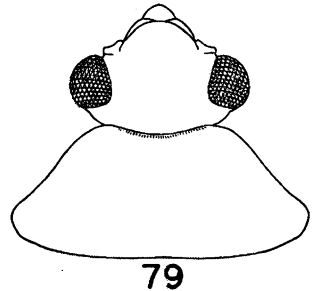
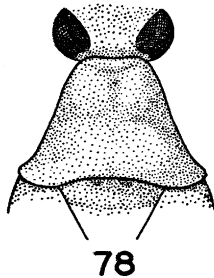
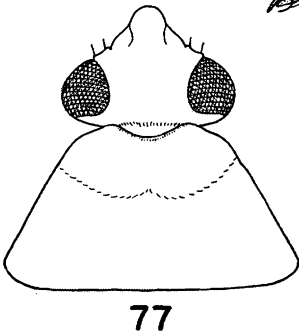
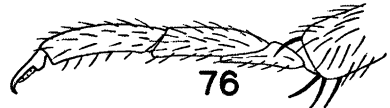
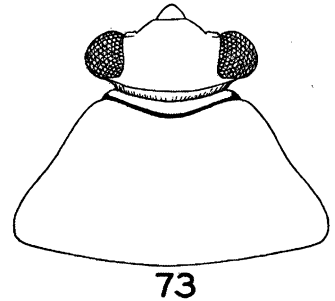
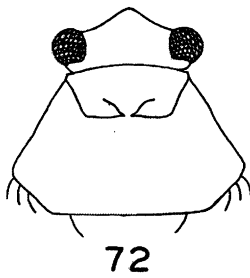
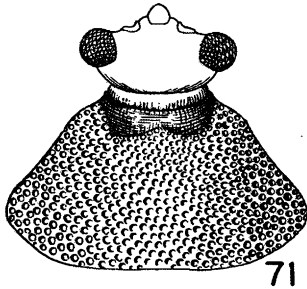
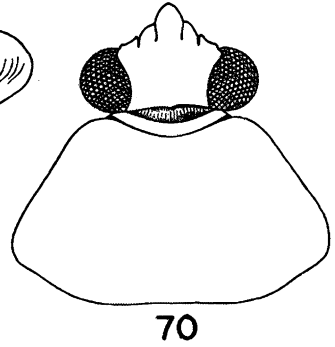
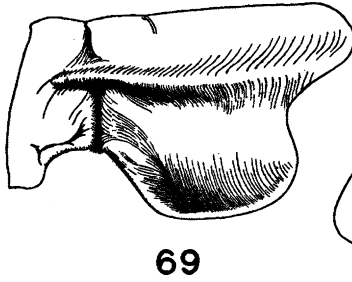
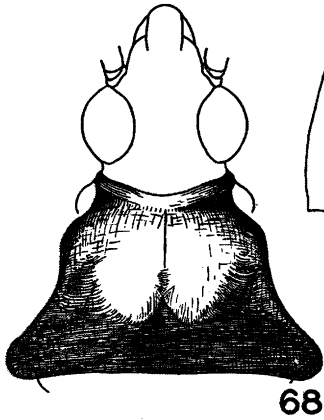


Fig. 68.—Head and pronotum of *Fulvius brunneus*.

Fig. 69.—Prothorax of *Miris dolabratus*, lateral aspect, showing the prominent lateral ridge characteristic of the Mirinae.

Fig. 70.—Head and pronotum of *Deraeocoris nubilus*.

Fig. 71.—Head and pronotum of *Bothynotus modestus*.

Fig. 72.—Head and pronotum of *Largidea grossa*.

Fig. 73.—Head and pronotum of *Monalocoris filicis*.

Fig. 74.—Tarsi of *Macrolophus tenuicornis*.

Fig. 75.—Tarsi of *Dicyphus vestitus*.

Fig. 76.—Tarsi of *Orectoderus obliquus*.

Fig. 77.—Head and pronotum of *Plagiognathus albifacies*.

Fig. 78.—Pronotal disk of *Orectoderus obliquus*, ♂.

Fig. 79.—Head and pronotum of *Macrotylus amoenus*.

ish yellow, with large, well-marked, dark brown areas.
 **Reuteroscopus**, p. 48
 Pseudarolia united with claw, fig. 39;
 color dark brown, or yellow with
 minute, darker markings.
 **Psallus**, p. 43

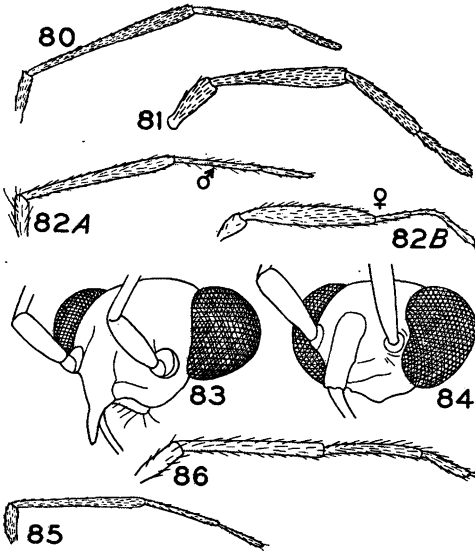


Fig. 80.—Antenna of *Orectoderus obliquus*, ♂.
 Fig. 81.—Antenna of *Rhinacloa forticornis*, ♀.
 Fig. 82.—Antenna of *Atractotomus magnicornis*. A, ♂; B, ♀.
 Fig. 83.—Head of *Microsynamma bohemanii*, ♂.
 Fig. 84.—Head of *Plagiognathus blatchleyi*, ♂.
 Fig. 85.—Antenna of *Rhinocapsus vanduzeei*.
 Fig. 86.—Antenna of *Microphylellus modestus*.

- 11. Length of second antennal segment less than width of head across eyes; in species in which the two are almost equal, hind femora not light with numerous dark spots. 12
- Length of second antennal segment greater than width of head across eyes; in species in which the two are almost equal, hind femora light with numerous dark spots. 14
- 12. Femora light colored, with conspicuous black spots on ventral surface. **Campylomma**, p. 25
- Femora dark brown to black or entirely light, without dark spots. . . 13

- 13. Hemelytra black, with a transverse light mark extending across middle of clavus, fig. 92; male antennae with first and second segments greatly thickened, fig. 92. **Leucopocila**, p. 50
- Hemelytra uniformly dark brown to black, never with a pale mark extending across clavus; male antennae slender, scarcely thicker than in female. **Chlamydatus**, p. 25
- 14. Pseudarolia large, projecting slightly beyond apices of claws, as in fig. 45; disk of prosternal xyphus depressed, and with elevated margins. 15
- Pseudarolia minute, not reaching tips of claws, figs. 40, 42; disk of prosternal xyphus convex, margins not elevated. 16
- 15. Rostrum not extending beyond hind coxae; head only moderately, obliquely produced. **Lopus**, p. 51
- Rostrum extending to middle of venter; head strongly produced anteriorly. **Amblytylus**, p. 51
- 16. Margin of compound eye well separated from antennal fossa, minimum space between the two more than one-third as great as diameter of antennal fossa; margin of compound eye near antennal fossa almost straight, fig. 83. **Microsynamma**, p. 42
- Margin of compound eye almost or quite touching antennal fossa, minimum space between the two not more than one-eighth as great as diameter of antennal fossa; margin of compound eye more or less emarginate near antennal fossa, fig. 84. 17
- 17. Hind tibiae with dark spines, these spines without dark spots at bases. 18
- Hind tibiae with light yellow to almost colorless spines, or with dark spines having dark spots at bases. 20
- 18. General color bright yellowish green, with large, well-marked, dark brown areas; pseudarolia attached at base of claw, tip free and extending to middle of claw, fig. 43. **Reuteroscopus**, p. 48
- General color dark red, or brown to black; pseudarolia completely united with claw, figs. 38-40. 19
- 19. General color dark red; second anten-

nal segment slightly swollen at apex, so as to become as wide as first segment, fig. 85.....

..... **Rhinocapsus**, p. 40

General color brown to black; second antennal segment linear, not so wide as first segment, fig. 86.....

..... **Microphylellus**, p. 40

20. Mesopleuron with flattened, scalelike pubescence..... **Psallus**, p. 43

Mesopleuron always without flattened, scalelike pubescence.....

..... **Plagiognathus**, p. 26

Campylomma Reuter

Campylomma verbasci (Meyer)

Capsus verbasci Meyer (1843, p. 70).

MALE.—Fig. 87. Length 2.50, width 1.10. General color pale testaceous to yellowish, mesoscutum and base of scutellum becoming

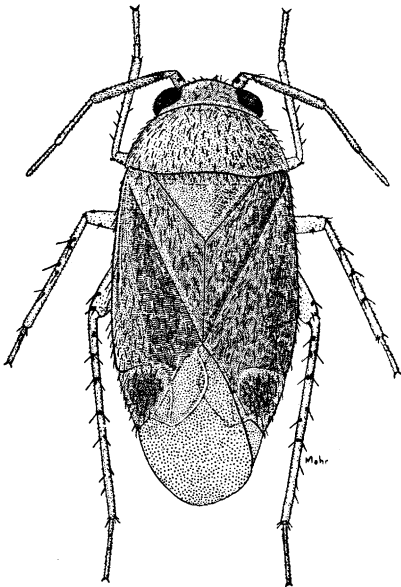


Fig. 87.—*Campylomma verbasci*, ♂.

fulvous, disk of cuneus pale fuscous. Tylus, apical half of first antennal segment and slender area at base of second, large spots on femora and tibiae, black. Body beneath dark brown; clothed with simple, dusky to blackish pubescence. Membrane uniformly pale smoky.

FEMALE.—Length 2.90; width 1.30.

HOST PLANTS.—In Illinois the commonest host is mullein (*Verbascum* sp.). This

insect has been taken also on *Verbena stricta* and *Brassica nigra*. It is known to breed occasionally on apple (*Pyrus malus*); sometimes it is attracted to colonies of aphids, where it feeds on their honeydew.

KNOWN DISTRIBUTION.—A common species in the eastern United States and Canada. This species came originally from Europe, but has long been established in North America. It is quite common almost everywhere mullein grows.

Illinois Records.—One hundred seven males and 84 females, taken May 30 to Aug. 1, are from Antioch, Arcola, Bloomington, Delavan, Galena, Kankakee, Monticello, Mount Carroll, Starved Rock State Park, Urbana.

Chlamydatus Curtis

KEY TO SPECIES

1. All femora black, with narrow areas at tips light yellowish; length 2.00–2.30..... **suavis**, p. 26
Front and middle femora more or less yellow..... 2
2. Front and middle femora clear yellow, hind femora black with apex yellow; length 2.50..... **associatus**, p. 25
All femora black with apical one-third yellow..... **pulicarius**, p. 26

Chlamydatus associatus (Uhler)

Agalliastes associatus Uhler (1872, p. 419).

ADULTS.—Length 2.50, width 1.00. Body mostly black. Front and middle legs, hind tibiae and first two segments of all tarsi, yellowish. Third and fourth antennal segments pale fuscous.

FOOD PLANT.—Ragweed (*Ambrosia* sp.).

KNOWN DISTRIBUTION.—Commonly found in the United States and Canada wherever ragweed grows.

Illinois Records.—Ninety-nine males and 86 females, taken May 14 to Nov. 1, are from Algonquin, Allerton, Alton, Amboy, Antioch, Bloomington, Centralia, Campaign, Chicago, Decatur, Delavan, Dubois, Elizabethtown, Galena, Galesburg, Grafton, Grand Detour, Grand Tower, Hardin, Harrisburg, Havana, Herod, Keithsburg, Lawrenceville, Monticello, Murphysboro, Normal, Oak Lawn, Oakwood, Oquawka, Oregon, Quincy, Rockford, Rockton, St. Anne, St. Joseph, Savanna, Springfield,

Starved Rock State Park, Tremont, Urbana, Zion.

Chlamydatus suavis (Reuter)

Agalliaestes suavis Reuter (1876, p. 92).

ADULTS.—Length 2.28, width 0.97; slightly smaller than *associatus* (Uhler); entirely black except the tibiae, which are pale yellow.

FOOD PLANT.—Ragweed (*Ambrosia* sp.).

KNOWN DISTRIBUTION.—Connecticut, Illinois, Iowa, Kansas, New York and southward.

Illinois Records.—Twenty-one males and 35 females, taken June 5 to Sept. 19, are from Algonquin, Alto Pass, Carbondale, Champaign, Darwin, Dixon, Dubois, Elizabeth, Evergreen Park, Fountain Bluff, Freeport, Galesburg, Grand Tower, Havana, Herod, Metropolis, Mount Carmel, Murphysboro, Rockford, Savanna, Starved Rock State Park, Urbana.

Chlamydatus pulicarius (Fallen)

Lygaeus pulicarius Fallen (1807, p. 95).

Not as yet collected in Illinois; known from Michigan, Minnesota, New York.

Plagiognathus Fieber

KEY TO SPECIES

- 1. Tibial spines pale, without black spots at bases..... 2
Tibial spines dark, with a black spot at base of each, these spots sometimes obsolete near apices of tibiae. 3
- 2. Almost colorless; first antennal segment with two black lines; a black line near apices of dorsal and ventral margins of femora; hind femora with single black spot on anterior aspect..... **nigrolineatus**, p. 34
Color yellowish, antennae and femora without black lines; hind femora with a few small fuscous points on anterior face..... **sericeus**, p. 34
- 3. Second antennal segment dark fuscous to black, sometimes slightly paler at middle, but always with more area black than light..... 4
Second antennal segment chiefly pale, blackish only at base.....31
- 4. Cuneous partly or entirely black, never chiefly brown..... 5

- Cuneus pale, or uniformly fulvous to dark brown, sometimes dusky at apex, but never distinctly black... 20
- 5. Cuneus more or less pale at base..... 6
Cuneus uniformly black like corium, rarely somewhat pale at fracture... 13
- 6. Scutellum partly or completely pale, sometimes pale only at apex or along lateral margins..... 7
Scutellum uniformly black..... 10
- 7. Scutellum black along median line, with variable light-colored areas at margins.....
..... **obscurus** var. **obscurus**, p. 32
Scutellum pale along median line, sometimes pale only at apex, or almost entirely light colored with only basal angles blackish..... 8
- 8. Rostrum short, scarcely reaching bases of middle coxae; pronotal disk with broad, dark stripes, leaving median line and lateral margins pale yellow..... **gleditsiae**, p. 37
Rostrum extending to hind coxae... 9
- 9. Femora pale to light yellowish brown, hind pair with two rows of prominent black spots, these spots sometimes obscured with darker color; hind femora never noticeably black at base and pale in middle; cuneus pale at base and along outer margin; length 3.90–4.50.....
..... **flavoscutellatus**, p. 32
Femora pale to black, usually black at base and pale in middle; in dark specimens femora black with only apices pale; cuneus pale at base, but not along outer margin; length 3.80–4.00... **politus** var. **flaveolus**, p. 29
- 10. Pronotum and hemelytra black; cuneus with a small, light-colored spot at base, or with apex paler than base..... 11
Pronotum pale at posterior margin, corium chiefly light yellowish brown or ivory white, but with a large, somewhat ovate, fuscous spot on apical half; cuneus pale, with a small black spot at apex.....
..... **obscurus** var. **fraternus**, p. 32
- 11. Femora yellowish, with one or two rows of black spots on anterior face, pubescence yellowish to golden; length 4.00..... **cuneatus**, p. 34
Femora black, pale at apices..... 12

- 12. Cuneus pale only on base; pubescence white; length 3.50.....
 **politus** var. **politus**, p. 29
 Cuneus pale at apex and along outer margin; pubescence yellowish to golden..... **cuneatus**, p. 34
- 13. Rostrum and legs chiefly yellowish, femora with black spots, or with black spots and lines..... 14
 Rostrum and legs black or obscured with very dark brown..... 16
- 14. Hind femora with black line above and one on ventral margin of apical half, also four or five black spots on anterior aspect.....
 . **annulatus** var. **annulatus**, p. 34
 Hind femora without black lines above and below..... 15
- 15. Length 3.80-4.00; legs orange yellow, hind femora with four or five black spots on antero-dorsal line, a second, less conspicuous row of dots just beneath, and a single spot just below at middle of apical half.....
 **negundinis**, p. 33
 Length 3.00; legs yellowish, femora with small, rather inconspicuous, fuscous dots arranged in series on anterior face..... **repetitus**, p. 40
- 16. Femora, tibiae and antennae very dark brown; third antennal segment dusky to fuscous, scarcely paler than second segment; hemelytra very dark brown, somewhat translucent, pubescence yellowish to dusky; length 4.00.....
 **laricicola**, p. 39
 Femora black except at extreme tips; tibiae pale, with prominent black spots..... 17
- 17. Length of second antennal segment less than width of head plus width of vertex..... 18
 Length of second antennal segment greater than width of head plus width of vertex..... 19
- 18. Deep black, strongly shining, with white pubescence; length 3.00.....
 **nigronitens**, p. 30
 Very dark brown, moderately shining, with golden yellow pubescence; length 3.50..... **cornicola**, p. 38
- 19. Rostrum extending to hind coxae; very dark brown, sometimes slightly translucent at cuneal fracture.....
 **annu-**
- **latus** var. **nigrofemoratus**, p. 34
 Rostrum extending only to middle of intermediate coxae; black, cuneus uniformly black like corium.....
 **nigritus**, p. 34
- 20. Rostrum short, not attaining posterior margin of sternum or base of middle coxae; frons with quadrate black spot on either side.....
 **gleditsiae**, p. 37
 Rostrum extending to or beyond middle coxae..... 21
- 21. Length of second antennal segment equal to or less than width of pronotum at base..... 22
 Length of second antennal segment greater than width of pronotum at base..... 26
- 22. Rostrum not extending beyond middle coxae..... **brevirostris**, p. 33
 Rostrum extending beyond middle coxae..... 23
- 23. Femora very dark brown, without definite spots..... **cornicola**, p. 38
 Femora with fuscous spots on anterior face, or uniformly pale with spots indistinct or absent..... 24
- 24. Hind femora with two rows of fuscous spots on anterior face; body dull yellowish brown, with lower half of head and under surface of body black..... **fulvidus**, p. 37
 Hind femora with fuscous spots either grouped on distal half, or absent, a dark line forming above; body pale to greenish yellow, ventral surface not darker..... 25
- 25. Pronotum and hemelytra uniformly light yellowish brown or greenish...
 ... **blatchleyi** var. **blatchleyi**, p. 35
 Basal half of pronotal disk, apical half of corium, and disk of clavus darkened with dark yellowish brown or black.....
 **blatchleyi** var. **nubilus**, p. 35
- 26. First antennal segment mostly pale; narrow area at base and two setigerous spots on apical half black.....
 **albifacies**, p. 35
 First antennal segment entirely black. 27
- 27. Rostrum not extending beyond middle coxae..... 28
 Rostrum extending beyond middle coxae..... 29
- 28. Body and wings uniformly straw

- colored or slightly tinged with yellow.....**atricornis**, p. 35
- Body dark; hemelytra black, basal one-third to one-half of embolium and corium pale, rarely dark; cuneus pale to fulvous, apex frequently dusky; length 4.30-4.70.....**brevirostris**, p. 33
- 29. Hemelytra without pale areas; general color light yellowish brown; tylus, lora and sternum black.....**rosicola**, p. 36
- Hemelytra fuscous with pale areas...30
- 30. Pale area of corium limited by claval suture; smaller forms, length 3.70-4.60.....**obscurus** var. **albocuneatus**, p. 32
- Pale area of corium limited by radial vein; females with fuscous area on apical half of corium divided into two spots by pale stripe which extends along radius and joins that of cuneus; larger forms, length 4.50-4.90.....**alboradialis**, p. 31
- 31. Scutellum, and usually entire dorsum as well, black.....32
- Scutellum pale or light yellowish brown, sometimes dark brown, frequently the median line blackish, but the basal angles distinctly paler; hemelytra more or less pale, in darkest forms very dark brown, but always somewhat translucent. 42
- 32. Hemelytra uniformly brownish and translucent; thorax and scutellum black.....**suffuscipennis**, p. 40
- Hemelytra uniformly black, or blackish with paler areas.....33
- 33. Cuneus very light yellow or reddish...34
- Cuneus chiefly black.....36
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- 37. First antennal segment mostly pale, black only on base; hind femora pale, a single black spot on lower margin near apex.....**davisi**, p. 38
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- 46. Scutellum uniformly colored, or with median line paler than basal angles. 47
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- 47. Femora rather uniformly dark except at apices, black spots indistinct; scutellum uniformly colored, usually dark yellowish brown or walnut colored, similar to dorsum.
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- 51. Rostrum scarcely attaining hind margins of middle coxae; propleura clothed only with slender pubescence; femora distinctly spotted with black although these dots at times are slightly obscured at apex.
- **repletus** var. **repletus**, p. 38
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- **albonotatus** var. **compar**, p. 31
- 52. Rostrum attaining hind margins of posterior coxae; basal half of corium and more or less broad area on either side of claval suture white; paler areas never brownish, darker areas distinctly black.
- **similis**, p. 37

- Rostrum not attaining hind margins of posterior coxae. 53
- 53. Hemelytra, except along basal half of radius, dark brown or yellowish brown; most of dorsum dull yellowish brown to tawny, sides of pronotal disk and median line of scutellum dark brown. **caryae**, p. 38
- Hemelytra black, outer half of clavus, basal half of corium and area extending along claval suture to apex pale and translucent.
- **repletus** var. **apicatus**, p. 38

Plagiognathus politus Uhler

Plagiognathus politus Uhler (1895, p. 52).

MALE.—Length 3.50, width 1.30; ovate, shining black; clothed with simple, pale or white pubescence. Femora dark fuscous to black, apices pale. Rostrum yellowish at middle, apex slightly surpassing hind coxae. Antennae black, tip of first segment pale, third and fourth pale or tinged only with fuscous. Tibiae pale or yellowish, with bases darker, and tibial spines with black spots surrounding their bases.

FEMALE.—Length 3.80, width 1.60; very similar to male but more robust.

Adults appearing after July, apparently of the second brood, are lighter in color, usually having the scutellum and mesal areas of the pronotum straw colored. They do not differ structurally from the typical form and belong to the variety *flaveolus* Knight (1923*d*, p. 434).

FOOD PLANTS.—Ragweed (*Ambrosia* sp.), goldenrod (*Solidago* sp.) and other herbaceous plants, particularly composites; reared from apple (*Pyrus malus*), where the nymphs fed on the tender foliage. In Illinois, specimens have been taken also on hickory (*Carya* sp.), willow (*Salix* sp.), birch (*Betula* sp.), cypress (*Taxodium distichum*), oak (*Quercus* sp.), hazelnut (*Corylus* sp.), red cedar (*Juniperus virginiana*), coralberry (*Symphoricarpos orbiculatus*), locust (*Robinia pseudoacacia*) and pine (*Pinus strobus*).

KNOWN DISTRIBUTION.—Commonly distributed east of the 100th meridian.

Illinois Records.—Four hundred forty-six males and 505 females, taken June 2 to Nov. 1, are from Albion, Algonquin, Allerton, Alton, Alto Pass, Amboy, Anna, Antioch, Beverly Hills, Bloomington, Bluff Springs, Browns, Bureau, Carbondale,

Champaign, Charleston, Chicago, Cypress, Danville, Darwin, Decatur, Delavan, Dolson, Dubois, Eichorn, Elizabethtown, Equality, Forest Park, Fountain Bluff, Fox Lake, Freeport, Galena, Galesburg, Glencoe, Golconda, Grand Detour, Grand Tower, Grandview, Grayville, Hamilton, Hardin, Harrisburg, Havana, Herod, Hillsboro, Homer, Joliet, Jonesboro, Kampsville, Kankakee, Kansas, Kappa, Karnak, Keithsburg, Lawrenceville, Mahomet, Makanda, Marshall, Mason City, McClure, Meredosia, Metropolis, Monticello, Mounds, Mount Carmel, Mount Forest, Muncie, New Milford, Newton, Normal, Oakwood, Oquawka, Oregon, Palos Park, Paxton, Quincy, River Forest, Rockford, Rockton, St. Anne, St. Joseph, Seymour, Shawneetown, Sparland, Springfield, Starved Rock State Park, Ullin, Urbana, Vienna, Volo, Ware, Warren, Warsaw, Waukegan, West Union, White Heath, White Pines Forest State Park, Willow Springs, York, Zion.

Plagiognathus pallidicornis Knight

Plagiognathus politus var. *pallidicornis* Knight (1923*d*, p. 435).

This species is allied to *politus* Uhler, but is easily to be distinguished by its pale antennae and shorter rostrum.

MALE.—Length 3.50, width 1.47. Head width 0.71, vertex 0.37. Antennae, first segment, length 0.24, black; second, 0.91, pale, black at base; third, 0.65, pale; fourth, 0.39, pale. Rostrum, length 1.21, reaching only to middle of hind coxae. General color black, moderately shining, pubescence pale, base of cuneus with a narrow, pale area; ventral margin of propleura, mesoepimera and ostiolar peritremes white.

FEMALE.—Length 3.40, width 1.56; slightly more robust but very similar to male in color and pubescence.

KNOWN DISTRIBUTION.—Connecticut, Illinois, Maine, Massachusetts, Minnesota, New Hampshire, New York, Ontario.

Illinois Records.—ANTIOCH: July 5-7, 1932, Frison *et al.*, 1 ♀; Aug. 1, 1930, Frison, Knight & Ross, 1 ♂, 1 ♀.

Plagiognathus nigronitens Knight

Plagiognathus nigronitens Knight (1923*d*, p. 435).

This species is slightly smaller than *politus* Uhler, with a shorter rostrum; the body

is shining black, with the cuneus uniformly black like the corium.

MALE.—Length 3.00, width 1.20. Head width 0.64, vertex 0.33. Rostrum scarcely attaining posterior margin of middle coxae. Antennae, first segment, length 0.22, black; second, 0.78, black, extreme tip pale; third, 0.66, pale; fourth, 0.45, dusky. Pronotum, length 0.53, width at base 1.03. Hemelytral margins very slightly arcuate; uniformly black, shining; cuneus never pale at base; clothed with pale yellowish pubescence. Membrane uniformly pale fuscous, a pale triangular spot bordering cuneus. Legs black, femora light in color at extreme tips; tibiae yellowish, spines with black spots at bases, hind pair becoming infuscated on basal one-third.

FEMALE.—Length 3.00, width 1.30; very slightly more robust than male but very similar in coloration.

FOOD PLANT.—Ragweed (*Ambrosia* sp.), sunflower (*Helianthus* sp.).

KNOWN DISTRIBUTION.—Colorado, Illinois, Michigan, Minnesota, Mississippi, New Jersey, New York, Ohio, Ontario, South Dakota.

Illinois Records.—Eighteen males and 28 females, taken May 12 to Aug. 1, are from Antioch, Champaign, Dubois, Fountain Bluff, Goreville, Grand Tower, Metropolis, Muncie, Oakwood, Vienna, Volo.

Plagiognathus flavicornis Knight

Plagiognathus flavicornis Knight (1923*d*, p. 436).

This is larger and more robust than *nigronitens* Knight and about the same size as *politus* Uhler, but the second antennal segment is pale except for a narrow area at the base; the cuneus remains uniformly black like the corium.

MALE.—Length 3.50, width 1.60. Head width 0.73, vertex 0.38. Rostrum scarcely attaining hind margins of middle coxae. Antennae, first segment, length 0.28, black, apex pale; second, 1.16; third, 0.83, fuscous; fourth, 0.55. Pronotum, length 0.61, width at base 1.16. General color black, shining, including basal margin of cuneus; clothed with yellowish to dusky pubescence. Membrane and veins uniformly dark fuscous. Legs black, tips of femora pale; tibiae pale; knees and spot at base of spines black; spots much reduced or absent on apical one-third.

FEMALE.—Length 3.30, width 1.60; very

similar to male in coloration but more robust in form.

FOOD PLANT.—Sweet gale (*Myrica gale*).

KNOWN DISTRIBUTION.—Illinois, Massachusetts, Minnesota, New York.

Illinois Records.—ANTIOCH: July 5-7, 1932, T. H. Frison, 1 ♂; Aug. 1, 1930, Frison, Knight & Ross, 3 ♂. CEDAR LAKE: Aug. 4, 1906, bog, 3 ♀. SUN LAKE: Aug. 9, 1906, bog, 1 ♀.

Plagiognathus chrysanthemi (Wolff)

Miris chrysanthemi Wolff (1804, p. 157).

Plagiognathus viridulus Reuter (1878, p. 74).

Known only from eastern Canada, New England states, New York, Pennsylvania; Europe. Feeds on the oxeye daisy, *Chrysanthemum leucanthemum*.

Plagiognathus alboradialis Knight

Plagiognathus alboradialis Knight (1923*d*, p. 439).

Known from British Columbia, Connecticut, Maine, Newfoundland, New Hampshire, New York, Ontario, Vermont.

Plagiognathus syrticolae new species

This runs to *flavicornis* Knight in my key (Knight 1923*d*, p. 431), but is distinguished by the shorter and thicker second antennal segment which, in length, just equals the width of the head.

MALE.—Length 3.30, width 1.25. Head width 0.69, vertex 0.34. Rostrum, length 1.08, reaching close to hind margins of hind coxae, dark fuscous, paler at middle. Antennae, first segment, length 0.19, black; second, 0.69, equal in thickness to first, yellowish, black at base, with close, pale pubescence; third, 0.43, yellowish; fourth, 0.31, pale. Pronotum, length 0.52, width at base 1.00. General color black, moderately shining; pubescence pale, with a few fuscous hairs on corium and cuneus. Legs fuscous, tips of femora paler, tibiae pale yellow, spines black, fuscous spots at bases of spines sometimes rather small, tarsi pale, apices fuscous.

FEMALE.—Length 3.60, width 1.50. Head width 0.69, vertex 0.36. Antennae, first segment, length 0.22; second, 0.69, third, 0.43; fourth, 0.30. Very similar to male in form, color and pubescence.

HOST PLANT.—Sand willow (*Salix syrticola*), a willow known only from the shores of the Great Lakes.

Holotype, male.—Waukegan, Ill.: July 6, 1932, on *Salix syrticola*, T. H. Frison *et al.*

Allotype, female.—Same data as for holotype.

Paratypes.—Same data as for holotype, 2 ♂, 18 ♀.

Plagiognathus albonotatus Knight

Plagiognathus albonotatus Knight (1923*d*, p. 437).

This is nearly the same size as *politus* Uhler, but is slightly more robust; the second antennal segment, except for its base, the cuneus, and the basal one-third or more of the corium, are pale.

MALE.—Length 3.50, width 1.50. Head width 0.71, vertex 0.36. Rostrum reaching hind coxae. Antennae, first segment, length 0.28, black; second, 1.00; third, 0.70; fourth, 0.47. Pronotum, length 0.57, width at base 1.11. General color black, basal one-third of embolium and corium, and portion of the adjacent area on clavus, pale; membrane uniformly fuscous; body clothed with pale yellowish pubescence. Legs black; tibiae pale; knees, spines and spot at base of each spine, black; spots absent or much reduced on apical one-third of tibiae.

FEMALE.—Length 3.40, width 1.60. Very similar to male, but slightly more robust. Pronotal disk frequently with pale spot on middle. Sides of venter more or less pale.

Specimens with more extensive pale areas than the typical have been designated *compar* Knight (1923*d*, p. 438); the two have been found to occur together in Illinois.

FOOD PLANT.—Meadow-sweet (*Spiraea salicifolia*).

KNOWN DISTRIBUTION.—Colorado, Illinois, Maine, Minnesota, New York, North Dakota, Ohio.

Illinois Records.—ANTIOCH: July 5-7, 1932, Frison *et al.*, 1 ♂, 1 ♀. NORTHERN ILLINOIS: 1 ♀.

Plagiognathus tinctus Knight

Plagiognathus albonotatus var. *tinctus* Knight (1923*d*, p. 437).

The size and color in this species are suggestive of *albonotatus* Knight, but the pale areas are tinged red.

MALE.—Length 3.70, width 1.50. Head width 0.69, vertex 0.30. Rostrum just reaching hind margins of middle coxae. Antennae.

first segment, length 0.22; second, 0.86, pale, narrow area at base black; third, 0.53, pale; fourth, 0.34. Pronotum, length 0.58, width at base 1.08. Body black; basal one-third of corium and embolium, adjacent area of clavus, cuneus and vertex, pale, but hypodermis tinged reddish; clothed with pale yellowish pubescence. Membranes fuscous, pale on veins and near apex of cuneus. Legs pale to reddish, hind femora with two rows of black X markings.

FEMALE.—Length 3.50, width 1.50; very similar to male in form and coloration.

Paler specimens lacking red in the hypodermis, referable to variety *debilis* Blatchley (1926b, p. 941), were taken in company with the typical form.

HOST PLANT.—Sandbar willow (*Salix longifolia*). A single Illinois specimen was taken on red cedar (*Juniperus virginiana*), but probably did not feed on that plant.

KNOWN DISTRIBUTION.—Illinois, Iowa, Minnesota, Ohio, Pennsylvania.

ILLINOIS RECORDS.—GALESBURG: June, 1 ♀. GRAND DETOUR: July 2, 1932, on *Salix* sp., Dozier & Mohr, 4 ♂, 6 ♀. HAVANNA: June 23, 1926, Frison & Hayes, 1 ♂. KAMPSVILLE: June 10, 1932, on *Juniperus virginiana*, H. L. Dozier, 1 ♂. MARSHALL: June 14, 1933, Frison & Ross, 1 ♂, 1 ♀. MONTICELLO: July 19, 1932, on *Salix* sp., T. H. Frison, 1 ♀. PROPHETSTOWN: July 7, 1925, T. H. Frison, 1 ♂. ROCKFORD: July 5, 1932, on *Salix* sp., Dozier & Mohr, 1 ♀. URBANA: Sept. 1, 1930, T. H. Frison, 1 ♂.

Plagiognathus flavoscutellatus Knight

Plagiognathus flavoscutellatus Knight (1923d, p. 440).

This may be distinguished by its pale scutellum and fulvous femora with two rows of black spots.

MALE.—Length 4.40, width 1.67. Head width 0.80, vertex 0.36. Rostrum reaching to middle of hind coxae. Antennae black; first segment, length 0.31; second, 1.43; third, 0.88; fourth, 0.47. Pronotum, length 0.68, width at base 1.29. General color black; basal half of embolium and corium, apex of embolium, base and outer margin of cuneus, pale to yellow, pale color on corium limited by radial vein. Membrane uniformly fuscous, spot bordering apex of cuneus and veins pale or yellowish. Legs fulvous to dark brown; femora with two rows of black spots

on anterior face, irregularly spotted on posterior face.

FEMALE.—Length 4.30, width 1.70; more robust than male, usually pale areas broader. Scutellum except base, area just before calli, and slight vitta on median line at base of pronotal disk, pale. Embolium, claval suture, anal ridges joining with base of cuneus, pale. Legs more fulvous than in male.

FOOD PLANT.—Sandbar willow (*Salix longifolia*).

KNOWN DISTRIBUTION.—New England states westward to Iowa, Minnesota and Nebraska.

ILLINOIS RECORDS.—Eighteen males and 12 females, taken June 1 to July 8, are from Beardstown, Elizabeth, Freeport, Grand Tower, Mount Carmel, Oakwood, Prophetstown, Thebes, West Union, White Heath.

Plagiognathus obscurus Uhler

Plagiognathus obscurus Uhler (1872, p. 418).

FEMALE.—Fig. 88. Length 4.40, width 1.69; larger and more elongate than *albonotatus* Knight, moderately shining, with pale yellowish pubescence. Rostrum scarcely reaching hind margins of posterior coxae. Antennae fuscous to black, first segment

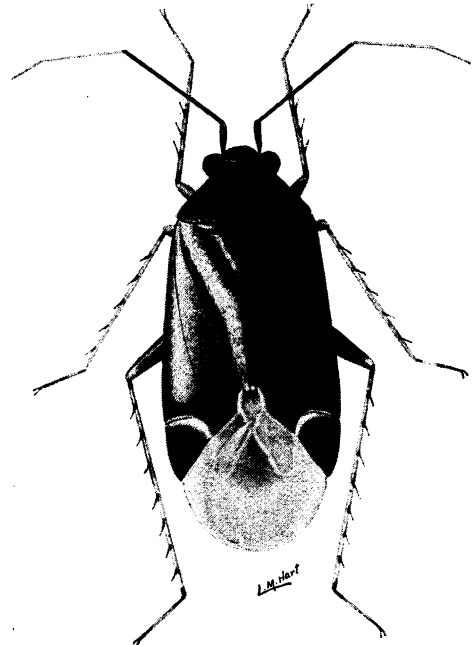


Fig. 88.—*Plagiognathus obscurus*.

pale at extreme apex. Pronotum blackish, calli and central area of disk pale; scutellum black, lateral margins more or less pale; sternum, pleura and ostiolar peritremes black. Hemelytra mostly black; basal one-third of embolium and corium, and adjacent area of clavus, pale; cuneus pale, but apex distinctly blackish. Legs pale to yellowish; base of hind coxae, line on apical half of dorsal margin of femora, and two rows of spots just beneath, black. Venter blackish, more or less pale on sides.

KNOWN DISTRIBUTION.—Colorado, Illinois, Massachusetts, Michigan, Minnesota, New York, Nova Scotia, Quebec.

An extremely light form of this species in which the cuneus is uniformly pale or yellowish, and in which broad, pale areas are sometimes present on the dorsum, is the variety *albocuneatus* Knight (1923*d*, p. 438). Those specimens of this species having the scutellum entirely black may be designated variety *fraternus* Uhler (1895, p. 51). This variety was originally described as a species, but the examination of a large amount of material, from Colorado as well as the eastern states, has led to the conclusion that *fraternus* is nothing more than a variety of *obscurus*. In Illinois material, intergrades occur between all these varietal forms, which are found together in the field.

Illinois Records.—Fifty-four males and 60 females collected June 2 to Sept. 13 are from Algonquin, Antioch, Elizabeth, Fox Lake, Frankfort, Galena, Mason City, Rockton, Rosiclare, Savanna, Starved Rock State Park, Urbana, Volo, Waukegan, Zion.

Plagiognathus negundinis Knight

Plagiognathus negundinis Knight (1929*d*, p. 263).

This species is allied to *annulatus* Uhler, but differs in having a longer second antennal segment which, in the male, equals or slightly exceeds the width of the pronotum at its base.

MALE.—Length 4.00, width 1.36. Head width 0.72, vertex 0.37. Rostrum reaching to middle of hind coxae. Antennae black; first segment, length 0.27; second, 1.20; third, 0.75; fourth, 0.35. Pronotum, length 0.62, width at base 1.17. General color black, vertex pale. Legs orange yellow, hind femora with a row of four or five black spots on antero-dorsal line, also one spot on median line of anterior face at middle of

apical half, sometimes with two or three smaller dots, and two subapical black spots beneath; tibiae yellow; knees, spines, and spots at bases of spines, black. Clothed with recumbent, yellowish to dusky brown pubescence.

FEMALE.—Length 3.80, width 1.40; very similar to male in pubescence and coloration.

A variety, *fulvotinctus* Knight (1929*d*, p. 264), is known from Iowa; it differs from the typical *negundinis* in that the embolium, basal half of corium, outer margin of clavus on basal half, and basal half of cuneus are pale to orange yellow.

FOOD PLANT.—Box Elder (*Acer negundo*).

KNOWN DISTRIBUTION.—Illinois, Iowa, Minnesota.

Illinois Records.—FOX LAKE: June 10, 1936, Ross & Burks, 1 ♂. GALENA: June 30, 1932, Dozier & Mohr, 1 ♂, 1 ♀. HAVANNA: May 31, 1933, C. O. Mohr, 2 ♂, 3 ♀. QUAWKA: June 13, 1932, H. L. Dozier, 2 ♀. PUTNAM: June 2, 1933, Mohr & Townsend, 2 ♂, 1 ♀. URBANA: June 20, 1932, Frison & Ross, 1 ♀. VOLO: July 8, 1932, Ross, Dozier & Mohr, 1 ♂.

Plagiognathus brevirostris Knight

Plagiognathus brevirostris Knight (1923*d*, p. 441).

The general aspect of this species is very similar to that of *obscurus* var. *albocuneatus* Knight, but it is larger and more elongate and the cuneus usually is tinged with fulvous; it is distinguished by the short rostrum, which does not reach the hind margins of the middle coxae.

MALE.—Length 4.60, width 1.80. Head width 0.79, vertex 0.37. Rostrum reaching middle of intermediate coxae. Antennae, first segment, length 0.35; second, 1.43; third, 1.00; fourth, 0.54. Pronotum, length 0.63, width at base 1.26. General color black, moderately shining, embolium and basal half of corium pale, dark color frequently invading apical half of embolium, sometimes pale color extending along claval suture to anal ridge; cuneus pale, usually tinged with fulvous; apex sometimes dusky. Legs black, femora frequently with rather broad, pale area at base; tibiae pale; knees, spines and spots at base black.

FEMALE.—Length 4.00, width 1.89; shorter and more robust than male; legs with broader pale areas.

KNOWN DISTRIBUTION.—Newfoundland and the New England states, westward to Michigan, Illinois and Minnesota.

Illinois Record.—ANTIOCH: June 10, 1933, Mohr & Townsend, 2 ♂, 3 ♀.

Plagiognathus cuneatus Knight

Plagiognathus annulatus var. *cuneatus* Knight (1923*d*, p. 442).

This form is allied to the typical *annulatus* Uhler, but the cuneus is pale at the base and sometimes at the lateral margin; the femora are yellowish and spotted with black, but the spots do not form black lines.

MALE.—Length 4.00, width 1.50. Head width 0.75, vertex 0.36. Rostrum extending to posterior margins of hind coxae. Antennae black; first segment, 0.30; second, 1.22; third, 0.83; fourth, 0.47. Pronotum, length 0.61, width at base 1.16. General color black; cuneus pale to yellowish at base and lateral margin; clothed with yellowish to golden pubescence. Membrane fuscous. Legs pale to yellow; hind femora with two rows of small fuscous spots on anterior face, sometimes clouded with fuscous.

FEMALE.—Length 4.20, width 1.70; more robust than male but very similar in coloration.

FOOD PLANT.—Wild aster (*Aster* sp.).

KNOWN DISTRIBUTION.—Georgia, Illinois, New Hampshire, New York, Texas, Vermont.

Illinois Record.—ELIZABETHTOWN: May 27-31, 1932, H. L. Dozier, 1 ♂, 1 ♀.

Plagiognathus nigritus Knight

Plagiognathus nigritus Knight (1923*d*, p. 441).

Known only from Colorado, Connecticut, Ohio.

Plagiognathus sericeus (Heidemann)

Psallus sericeus Heidemann (1892, p. 226).

Plagiognathus tiliae Knight (1926*h*, p. 252).

This species is distinguished by its uniformly pale yellow color and by a few small, fuscous points on the anterior face of its hind femora.

MALE.—Length 3.30, width 1.34. Head width 0.74, vertex 0.31. Antennae uniformly yellowish; first segment, length 0.21; second, 1.08; third, 0.51; fourth, 0.31. Pronotum, length 0.57, width at base 1.10. Body uni-

formly pale yellow, the same color as the *Tilia* blossoms among which the insect retreats; indistinct fuscous points on femora arranged in a double row, tibial spines pale to brownish. Body clothed with soft, recumbent, simple pubescence of pale to golden yellow color.

FEMALE.—Length 3.50, width 1.50. Coloration and pubescence similar to those of male.

HOST PLANT.—Basswood (*Tilia americana*); a single specimen was taken on elm (*Ulmus americana*), but may not have been feeding on that tree.

The adult stage is attained just as the basswood flowers come into full bloom, and the yellow color of the mature bugs matches the color of the flowers perfectly. When disturbed the bugs hide among the petals and are then difficult to see.

KNOWN DISTRIBUTION.—District of Columbia, Illinois, Iowa, Minnesota.

Illinois Records.—ANTIOCH: July 5-7, 1932, on *Tilia* sp., T. H. Frison *et al.*, 2 ♂, 3 ♀. KAMPSVILLE: June 10, 1932, on *Tilia* sp., H. L. Dozier, 5 ♂, 2 ♀. MUNCIE: July 22, 1932, Dozier & Park, 1 ♂, 1 ♀. NEW MILFORD: July 3, 1936, Ross & Burks, 1 ♂. URBANA: July 2, 1914, at light, 1 ♀; June 27, 1932, on elm, Frison & Ross, 1 ♀. WAUKEGAN: July 6, 1932, on *Tilia* sp., T. H. Frison *et al.*, 11 ♂, 8 ♀.

Plagiognathus annulatus Uhler

Plagiognathus annulatus Uhler (1895, p. 51)

Neither the typical form of this species nor the variety *nigrofemoratus* Knight (1923*d*, p. 443) has yet been taken in Illinois; known from Colorado, Connecticut, Massachusetts, Montana, New York.

Plagiognathus nigrolineatus Knight

Plagiognathus nigrolineatus Knight (1923*d*, p. 443).

This is uniformly pale greenish, with pale pubescence; it may be distinguished by the black lines on the antennae and femora.

MALE.—Length 4.30, width 1.58. Head width 0.75, vertex 0.33. Rostrum reaching to middle of hind coxae. Antennae, first segment, length 0.28, pale, two longitudinal black lines on dorsal surface; second, 1.38, pale, a slender black line on anterior surface extending from base to near middle; third, 0.69, pale; fourth, 0.31. Pronotum, length

0.64, width at base 1.22. General color uniformly pale green, translucent. Legs pale; slender line on dorsal margin of femora, line on apical half of postero-ventral margin of hind femora, and a single dot on anterior face, black.

FEMALE.—Length 4.30, width 1.66; similar to male in coloration.

FOOD PLANT.—Bur oak (*Quercus macrocarpa*).

KNOWN DISTRIBUTION.—Connecticut westward to Minnesota and southward to Texas, its distribution nearly coinciding with the range of its host tree.

ILLINOIS RECORDS.—DUBOIS: May 15, 1916, 1 ♂, 1 ♀; May 22, 1917, 4 ♂, 1 ♀; May 23, 1917, 1 ♂. FRANKFORT: June 8, 1933, Mohr & Townsend, 1 ♀. MONTICELLO: June 11, 1934, Frison & DeLong, 1 ♀. WHITE PINES FOREST STATE PARK: on *Quercus* sp., Dozier & Mohr, 2 ♀.

Plagiognathus albifacies Knight

Plagiognathus albifacies Knight (1927b, p 11).

This species is allied to *blatchleyi* Reuter, but is distinguished by its pale first antennal segment, black sternum, longer head and differently formed male genital claspers.

MALE.—Length 4.40, width 1.50. Head width 0.81, vertex 0.35. Rostrum just reaching posterior margins of hind coxae. Antennae, first segment, length 0.39; second, 1.55; third, 1.14; fourth, 0.58. Pronotum, length 0.74, width at base 1.28. Hemelytra pale yellow, inner half of clavus and apical half of corium dusky to pale fuscous; cuneus pale to dusky, translucent. Legs pale, femora with two rows of black spots on anterior face, hind femora with antero-dorsal row composed of six larger black spots. Genital claspers distinctive, the left clasper with lateral or basal lobe much larger than in *blatchleyi*.

FEMALE.—Length 4.70, width 1.68. Very similar to male in coloration and pubescence.

FOOD PLANT.—Leafcup (*Polymnia canadensis*).

KNOWN DISTRIBUTION.—Illinois, Indiana, Maryland.

ILLINOIS RECORDS.—ALDRIDGE: May 8, 1932, H. L. Dozier, 1 ♀. BLOOMINGTON: July 18, 1932, T. H. Frison, 7 ♂, 1 ♀. DANVILLE: Aug. 17, 1934, DeLong & Ross, 2 ♀. GOLCONDA: July 25, 1930, on *Polymnia canadensis*, Knight & Ross, 48 ♂, 68 ♀.

HARDIN: June 5-9, 1932, H. L. Dozier, 11 ♂, 13 ♀. KARNAK: June 23, 1932, Ross, Dozier & Park, 1 ♀. URBANA: 1930, on *Polymnia* sp., T. H. Frison, 2 ♂, 6 ♀; Aug. 25, 1930, H. H. Knight, 8 ♂, 1 ♀.

Plagiognathus atricornis Knight

Plagiognathus atricornis Knight (1926a, p. 9).

This species is distinguished by its pale color, pale pubescence and black antennae.

MALE.—Length 3.50, width 1.20. Head width 0.77, vertex 0.27. Eyes prominent, black. Rostrum just attaining posterior margins of middle coxae. Antennae uniformly black; first segment, length 0.24; second, 1.07; third, 0.66; fourth, 0.34. Pronotum, length 0.54, width at base 1.03. General color pale greenish testaceous, pronotum distinctly green, calli yellowish; hemelytra somewhat translucent, membrane and veins uniformly pale fumate. Legs pale, hind femora with a double row of prominent black spots; knees, tibial spines, and large spots at base of spines, black.

FEMALE.—Length 3.40, width 1.34. Form and coloration similar to those of male.

HOST PLANT.—Specimens were taken in Illinois on red birch (*Betula nigra*).

KNOWN DISTRIBUTION.—Previously known only from Pennsylvania.

ILLINOIS RECORD.—HARRISBURG: June 25, 1932, on *Betula nigra*, Ross, Dozier & Park, 2 ♂, 1 ♀.

Plagiognathus blatchleyi Reuter

Plagiognathus blatchleyi Reuter (1912a, p. 61).

MALE.—Length 4.60, width 1.70; pale greenish and yellowish brown; clothed with pale yellowish pubescence, hairs becoming dusky on cuneus and apical half of corium and embolium. Antennae black, third and fourth segments pale fuscous, extreme apex of first and second segments pale. Tylus black. Basal and apical segments of rostrum almost black. Legs nearly as in *chrysanthemi* (Wolff) but black spots on femora less conspicuous. Membrane fuscous, central area of apical half, veins and area invading each side, paler.

FEMALE.—Length 4.40, width 1.70; very similar to male in coloration, although membrane, and sometimes antennae, slightly paler.

All but one or two of the Illinois specimens are darker than the typical form, with a brown band developed across the basal half of the pronotum and the apical half of the clavus. These belong to the variety *nubilus* Knight (1923*d*, p. 444).

FOOD PLANT.—Several specimens were taken in Illinois on ragweed (*Ambrosia* sp.).

KNOWN DISTRIBUTION.—District of Columbia, Illinois, Maine, Maryland, Massachusetts, New Jersey, New York, Ohio, Virginia.

Illinois Records.—Nineteen males and 19 females, taken Aug. 10 to Oct. 6, are from Algonquin, Carbondale, Charleston, Elizabethtown, Havana, Jonesboro, Mounds, Oakwood, Rockford, Sparland, Urbana.

Plagiognathus salicicola Knight

Plagiognathus salicicola Knight (1929*b*, p. 69).

This species is suggestive of *delicatus* (Uhler) but is easily distinguished by its larger size and black markings; the cuneus is black with pale margins.

MALE.—Length 4.10, width 1.50. Head width 0.83, vertex 0.33. Rostrum extending to middle of hind coxae. Antennae, first segment, length 0.27; second, 1.09, pale, base and apex black; third, 0.77; fourth, 0.45. Pronotum, length 0.65, width at base 1.26. Clothed with pale to yellowish simple pubescence. General color black; anterior margin of pronotum, disk behind calli, lower half of propleura, scutellum except at base, areas along claval suture and radial vein, embolium, all margins of cuneus, sides of sternum, epimera, and apical area of genital segment, pale to yellowish. Legs pale, with two rows of spots on femora; apex of inner face of femora, knees, spots and spines on tibiae, black.

FEMALE.—Length 3.90, width 1.70; very similar to male in pubescence and coloration, but with pale areas on dorsum broader.

The fuscous markings on the dorsum vary considerably in intensity and size; the extremely light form, in which these markings are very indistinct, is referable to the variety *depallens* Knight (1929*b*, p. 70).

FOOD PLANT.—Sandbar willow (*Salix longifolia*).

KNOWN DISTRIBUTION.—Illinois, Indiana, Iowa, Minnesota.

Illinois Records.—ALTON: July 19-21, 1932, on *Salix* sp., Ross & Dozier, 2 ♀. ANNA: June 6, 1884, 1 ♀. SAVANNA: July 23, 1892, on sandbar in Mississippi River, McElfresh, Hart & Forbes, 5 ♀; July 25, 1892, from sandy island in Mississippi River, McElfresh, Hart, Shiga & Forbes, 1 ♂, 5 ♀; July 26, 1892, along railroad in bottomlands, McElfresh, Hart & Forbes, 1 ♀; July 27, 1892, at light and sugar, McElfresh, Shiga, Forbes & Hart, 1 ♂, 1 ♀; Aug. 1, 1892, from willow, F. M. McElfresh, 1 ♂. WEST UNION: June 26, 1932, on *Salix* sp., Ross, Dozier & Park, 2 ♂.

Plagiognathus rosicola Knight

Plagiognathus rosicola Knight (1923*d*, p. 446).

This species is fulvo-testaceous, with the antennae, tylus, sternum, and prominent spots on the femora, black; the rostrum reaches to the middle of the venter.

MALE.—Length 4.30, width 1.64. Head width 0.75, vertex 0.33. Antennae black; first segment, length 0.31; second, 1.42; third, 1.00; fourth, 0.44. Pronotum, length 0.66, width at base, 1.22. Color fulvo-testaceous to fusco-brownish, clothed with yellowish or golden pubescence; scutellum slightly darker than pronotum, disk of cuneus darker. Legs pale yellow and tinged with brown, femora with two rows of very prominent black spots on anterior face; tibiae with large and prominent black spots at base of spines.

FEMALE.—Length 4.40, width 1.70; more robust than male, but very similar in coloration.

FOOD PLANT.—Wild rose (*Rosa* sp.).

KNOWN DISTRIBUTION.—Illinois, Kansas, Maryland, Missouri.

Illinois Record.—MONTICELLO: July 19, 1932, T. H. Frison, 1 ♂.

Plagiognathus albatus (Van Duzee)

Psallus albatus Van Duzee (1915, p. 116).

ADULTS.—Length 4.20, width 1.40. General color whitish. Tylus, basal segment of antennae, more or less broad area at lateral margins of pronotal disk, inner half of clavus, subapical spot on corium or, in darker specimens, spot covering apical half of corium, sternum and venter, black. Calli and second antennal segment frequently yellowish. Membrane pale, a distinct fus-

cous ray along margin just beyond clear spot at tip of cuneus. Hind femora with a group of black spots on apical half, sometimes with a subdorsal row of spots extending over basal half. Tibiae with small and sometimes indistinct spots at bases of spines; female with pale areas broader than those of male.

The variety *vittiscutis* Knight (1923*d*, p. 445) differs from the typical in having the apical half of the cuneus black; it has not yet been collected in Illinois. It occurs on butternut (*Juglans cinerea*).

FOOD PLANT.—Sycamore (*Platanus occidentalis*); specimens were also taken on walnut (*Juglans nigra*).

KNOWN DISTRIBUTION.—Connecticut, District of Columbia, Georgia, Illinois, Iowa, Massachusetts, Michigan, Minnesota, New York, Ohio, Pennsylvania, Quebec.

Illinois Records.—Forty-seven males and 49 females, taken June 13 to Aug. 9, are from Alton, Ashley, Danville, Dolson, Eichorn, Herod, Kansas, Monticello, Oakwood, Putnam, Rockford, Urbana, Vienna.

Plagiognathus similis Knight

*Plagiognathus albatu*s var. *similis* Knight (1923*d*, p. 445).

The coloration of this form is suggestive of *albatu*s (Van Duzee), but it may be distinguished by the black base of its second antennal segment and the two rows of black spots on the hind femora.

MALE.—Length 3.90, width 1.38. Head width 0.78, vertex 0.30. Rostrum extending almost to hind margin of posterior coxae. Antennae, first segment, length 0.23; second, 1.08; third, 0.72; fourth, 0.43. Pronotum, length 0.62, width at base 1.14. General color black, varied with pale; scutellum pale, with a rather broad, black, median line; hemelytra pale, inner half of clavus, apical half of corium and area invading embolium, black; cuneus pale, translucent, apical half black. Legs pale yellow; hind femora with two rows of black spots, anterior pairs with three or four spots forming a line; tibial spines black with prominent black spot around base of each.

FEMALE.—Length 3.50, width 1.50; very similar to male in form and coloration.

FOOD PLANT.—Red birch (*Betula nigra*). Taken also on alder (*Alnus*) in Michigan and on birch in Maryland.

Illinois Records.—EICHORN: June 24, 1932, Hicks Branch, on *Betula nigra*, Ross,

Dozier & Park, 1 ♂. GALENA: June 30, 1932, on *Betula nigra*, Dozier & Mohr, 2 ♂, 3 ♀. HARRISBURG: June 25, 1932, on *Betula nigra*, Ross, Dozier & Park, 20 ♂, 24 ♀; June 15, 1934, DeLong & Ross, 1 ♀.

Plagiognathus fulvidus Knight

Plagiognathus fulvidus Knight (1923*d*, p. 447).

Known from Connecticut, Maryland, New Jersey, North Carolina, Ohio.

Plagiognathus delicatus (Uhler)

Psallus delicatus Uhler (1887*b*, p. 34).

ADULTS.—Length 3.30, width 1.40. General color reddish yellow to brownish. First antennal segment except extreme tip, and a ring at base of second segment, dark fuscous; front of head more or less dark either side of median line. Hemelytra, sternum and abdomen shaded with fuscous, sometimes basal margins of calli quite dark; scutellum yellowish, usually with basal angles dark, thus leaving a median pale line; membrane lightly shaded with fuscous; cuneus with area near middle and spot on either side adjacent to apex clear. Legs pale yellow to fulvous, with two rows of spots on femora; tibial spines and spots around their bases, and apex of tarsi and claws, black.

HOST PLANT.—Honey locust (*Gleditsia triacanthos*).

KNOWN DISTRIBUTION.—Illinois, Indiana, Iowa, Missouri, New York, Ohio, Pennsylvania, Virginia.

Illinois Records.—ELIZABETH TOWN: May 27-31 1932, H. L. Dozier, 1 ♂, 9 ♀. GRAND TOWER: May 12, 1932, Frison, Ross & Mohr, 18 ♂, 11 ♀. URBANA: June 7, 1916, on tree trunk, 1 ♀; June 9, 1916, on tree trunk, 1 ♀; June 27, 1917, on tree trunk, 7 ♀; June 1, 1933, H. H. Ross, 1 ♀.

Plagiognathus gleditsiae Knight

Plagiognathus gleditsiae Knight (1929*d*, p. 265).

This species is allied to *delicatus* (Uhler), but is distinguished by its broader head and shorter rostrum; the scutellum is black with a median pale line, and the frons has a quadrate black spot on either side of the median line.

MALE.—Length 3.00, width 1.17. Head

width 0.69, vertex 0.34. Rostrum reaching only to middle of sternum. Antennae dark fuscous to black; first segment, length 0.17; second, 0.78, third, 0.39; fourth, 0.22. Pronotum, length 0.52, width at base 1.04. General color dark fuscous to black; vertex, median line of frons, median line and lateral margins of pronotal disk, claval suture, and base of cuneus, straw colored to yellowish. Legs straw colored to yellowish, femora dusky but with small, darker spots showing through; tibial spines and spots around their bases black. Body clothed with fine, short, pale to dusky pubescence.

FEMALE.—Length 3.00, width 1.29. Rather similar to male in form and pubescence, but color much paler; pronotum yellowish with only calli black; frons with quadrate black spot on either side; median line of scutellum pale; hemelytra pale yellowish with fuscous confined to inner angles of clavus and apical half of corium, and with cuneus uniformly pale.

FOOD PLANT.—Honey locust (*Gleditsia triacanthos*).

KNOWN DISTRIBUTION.—Illinois and Texas.

Illinois Records.—**DOLSON:** June 25, 1932, Rocky Branch, Frison & Mohr, 1 ♀. **FOUNTAIN BLUFF:** May 15, 1932, Frison, Ross & Mohr, 1 ♂. **GRAND TOWER:** May 12, 1932, Frison, Ross & Mohr, 5 ♀; May 12, 1932, H. L. Dozier, 1 ♂. **MAKANDA:** Giant City State Park, May 21, 1932, H. L. Dozier, 1 ♀.

***Plagiognathus caryae* Knight**

Plagiognathus caryae Knight (1923*d*, p. 448).

Occurs on hickory (*Carya ovata*) and pecan (*C. illinoensis*). Not yet taken in Illinois; known from Mississippi, New York and Texas.

***Plagiognathus repletus* Knight**

Plagiognathus repletus Knight (1923*d*, p. 449).

This species is suggestive of *albatus* var. *vittiscutis* Knight but has the rostrum distinctly shorter.

MALE.—Length 3.70, width 1.25. Head width 0.69, vertex 0.30. Rostrum extending only to middle of intermediate coxae. Antennae, first segment, length 0.26; second, 1.10 third, 0.69; fourth, 0.34. Pronotum, length 0.56, width at base 1.10; black; area occupy-

ing center of disk and extending between calli, pale yellowish. Scutellum yellowish; median line black. Hemelytra black; basal one-third of corium, embolium and cuneus, yellowish, translucent; membrane fuscous, veins paler. Clothed with simple yellowish pubescence. Legs yellowish; hind femora brownish on apical half except at extreme apex; two rows of black spots on anterior face; front and middle femora showing only three or four spots.

FEMALE.—Length 3.90, width 1.40; more robust than male and rather similar in coloration, but frequently with the pale areas broader. Very pale specimens may fail to show dark line on scutellum.

The variety *apicatus* Knight (1923*d*, p. 449) is generally darker on the dorsum than is the typical form; *repletus apicatus* has not been collected in Illinois.

FOOD PLANTS.—Walnut (*Juglans nigra*) and butternut (*Juglans cinerea*).

KNOWN DISTRIBUTION.—Connecticut, Illinois, Iowa, New York, Ohio.

Illinois Records.—Nineteen males and 36 females, taken June 5 to July 17, are from Alton, Freeport, Galena, Galesburg, Grand Detour, Hardin, Harvard, Marshall, Monticello, Palos Park.

***Plagiognathus davisii* Knight**

Plagiognathus davisii Knight (1923*d*, p. 452).

Known from Iowa and New York, but not yet taken in Illinois.

***Plagiognathus cornicola* Knight**

Plagiognathus cornicola Knight (1923*d*, p. 450).

The general coloration of this species is fusco-brownish or ligneous with the calli darker; the second antennal segment is fusco-brownish and black at the base.

MALE.—Length 3.40, width 1.24. Head width 0.69, vertex 0.32. Rostrum reaching near hind margin of middle coxae. Antennae, first segment, length 0.21; second, 0.82; fusco-brownish to fuscous, black at base; third, 0.60; fourth, 0.34. Pronotum, length 0.54, width at base 1.10. General color fusco-brownish or ligneous, somewhat translucent on hemelytra; cuneus evenly colored like corium; membrane fuscous, veins pale brownish. Body clothed with yellowish to golden pubescence. Legs fusco-brownish to black; tip of femora pale; tibial spines with

prominent black spots around the base of each.

FEMALE.—Length 3.10, width 1.33; slightly more robust than male, but very similar in coloration.

FOOD PLANTS.—Dogwoods (*Cornus amomum* and *C. stricta*).

KNOWN DISTRIBUTION.—Illinois, Massachusetts, New York, Virginia.

Illinois Records.—FRANKFORT: June 8, 1933, Mohr & Townsend, 1 ♂, 1 ♀. ST. JOSEPH: June 17, 1932, T. H. Frison, 1 ♂. URBANA: June 20, 1932, T. H. Frison, 4 ♂, 3 ♀.

Plagiognathus laricicola Knight

Plagiognathus laricicola Knight (1923*d*, p. 452).

This species is black, with fuscous legs; small black spots show through the obscuration on the legs; the body is clothed with yellowish and dusky pubescence.

MALE.—Length 3.90, width 1.40. Head width 0.66, vertex 0.33. Rostrum reaching to middle of hind coxae. Antennae, first segment, length 0.27; second, 1.03, fusco-brownish with black at base; third, 0.66; fourth, 0.36. Pronotum, length 0.55, width at base 1.11. Body fuscous black; base of cuneus scarcely paler than corium. Legs dark fuscous; small black dots visible on anterior and posterior faces of femora; tibiae fuscous, but black setigerous spots showing through infuscation.

FEMALE.—Length 3.60, width 1.55; more ovate and robust than male, but very similar in coloration.

FOOD PLANT.—Larch (*Larix laricina*).

KNOWN DISTRIBUTION.—Canada, Illinois, Maine, Minnesota, New York.

Illinois Records.—ANTIOCH: July 5-7, 1932, on *Larix*, Frison *et al.*, 44 ♂, 78 ♀. GRAND DETOUR: July 2, 1932, Dozier & Mohr, 1 ♀.

Plagiognathus punctatipes Knight

Plagiognathus punctatipes Knight (1923*d*, p. 450).

This species is black, with the second antennal segment black at base, pale beyond; the legs are yellowish, and the hind femora have two rows of black spots on each anterior face.

MALE.—Length 3.80, width 1.70. Head width 0.72, vertex 0.37. Rostrum reaching

middle of hind coxae. Antennae, first segment, length 0.25; second, 0.97; third, 0.66; fourth, 0.39. Pronotum, length 0.67, width at base 1.28. Body black, moderately shining, clothed with pale yellowish pubescence; cuneus uniformly black, scarcely translucent at base. Legs pale yellowish to fulvous; hind femora with two rows of prominent black spots on anterior faces; tibial spines with rather small black spots around bases.

FEMALE.—Length 3.70, width 1.70; slightly more robust than male, but very similar in coloration.

FOOD PLANT.—Black walnut (*Juglans nigra*). A single Illinois specimen was taken on apple.

KNOWN DISTRIBUTION.—Illinois, Michigan, New York, Ohio, Ontario, Pennsylvania.

Illinois Records.—Twenty-six males and 28 females, taken May 27 to July 6, are from Elizabethtown, Freeport, Galena, Hardin, Kampsville, Keithsburg, Urbana, Warsaw, White Heath, White Pines Forest State Park, Zion.

Plagiognathus dispar Knight

Plagiognathus punctatipes var. *dispar* Knight (1923*d*, p. 451).

This species is smaller and more slender than *punctatipes* Knight; the two are very similar in coloration, but *dispar* has a narrow, pale area at base of cuneus. This species was originally described as a variety of *punctatipes* Knight, but more recent examination of the genital characters reveals a distinct difference in structure of the left genital clasper.

MALE.—Length 3.50, width 1.28. Head width 0.67, vertex 0.31. Rostrum reaching middle of hind coxae. Antennae, first segment, length 0.22; second, 0.90, yellow with narrow black area at base; third, 0.58; fourth, 0.36. Pronotum, length 0.53, width at base 1.06. Body black, moderately shining; base of cuneus yellowish, translucent. Legs straw colored to yellow; hind femora with two rows of fuscous spots on anterior face and a group of five or six spots on posterior surface near apex; tibiae with very small fuscous spots around base of spines.

FEMALE.—Length 3.30, width 1.39; slightly more robust than male but very similar in coloration.

The cuneus varies considerably in color; specimens in which it tends to be entirely,

rather than partly, black belong to the variety *crataegi* Knight (1929*d*, p. 264).

FOOD PLANTS.—Hickory (*Carya* sp.), hawthorn (*Crataegus* sp.); Illinois specimens were taken also on ash (*Fraxinus* sp.).

KNOWN DISTRIBUTION.—Illinois, Iowa, Michigan, New England, New York.

Illinois Records.—Sixty-three males and 67 females, taken May 31 to July 4, are from Champaign, Dixon, Frankfort, Havana, Joliet, Lacon, Sparland, Urbana, White Pines Forest State Park.

Plagiognathus suffuscipennis Knight

Plagiognathus suffuscipennis Knight (1923*d*, p. 454).

This species is distinguished by its translucent, pale yellowish brown hemelytra; the second antennal segment is pale yellowish brown, darker at the base.

MALE.—Length 3.40, width 1.30. Head width 0.68, vertex 0.36. Rostrum reaching hind coxae. Antennae, first segment, length 0.23; second, 0.81; third, 0.54; fourth, 0.36. Pronotum, length 0.45, width at base 0.98. Body blackish brown; pubescence yellowish to dusky; scutellum black; cuneus uniformly translucent yellowish brown like corium. Legs yellowish testaceous; femora with two series of fuscous dots on anterior face and a group of six or eight spots on apical half of posterior face.

FEMALE.—Length 3.20, width 1.37; very similar to male in coloration, but more robust in form.

FOOD PLANT.—Spruce (*Picea mariana*).

KNOWN DISTRIBUTION.—Illinois, Maine, Minnesota, New York.

Illinois Records.—ANTIOCH: July 5-7, 1932, Frison *et al.*, 1 ♀. GALENA: June 30, 1932, on spruce, Dozier & Mohr, 10 ♂, 8 ♀. KEITHSBURG: June 15, 1932, on spruce, H. L. Dozier, 6 ♂, 8 ♀.

Plagiognathus guttulosis (Reuter)

Psallus guttulosis Reuter (1876, p. 89).

This species is distinguished by its pale color and its numerous reddish brown dots. It has been placed in the genus *Psallus* up to the present time, but the possession of a single type of simple pubescence refers it to *Plagiognathus*.

MALE.—Length 3.00, width 1.20. Head width 0.69, vertex 0.30. Rostrum reaching posterior margins of hind coxae. Antennae,

first segment, length 0.21; second, 0.99; thickness equal to that of first segment; third, 0.34; fourth, 0.26. Pronotum, length 0.52, width at base 0.99. Body pale, thickly dotted with reddish brown to dusky brown points; calli shaded brown; median line of pronotal disk paler. Body clothed with pale to yellowish simple pubescence. Legs pale; femora thickly dotted with brown, hind pair darker; tibial spines pale, but with black dot around base of each.

FEMALE.—Length 3.00, width 1.40; very similar to male in color and pubescence.

FOOD PLANT.—Oak (*Quercus* sp.)

KNOWN DISTRIBUTION.—Florida, Illinois, Mississippi, Texas.

Illinois Records.—CHAMPAIGN: June 6, 1888, at electric light, 1 ♂. DUBOIS: May 21, 1917, 1 ♂; May 22, 1917, 5 ♀.

Plagiognathus repetitus Knight

Plagiognathus repetitus Knight (1923*d*, p. 453).

Breeds on cranberry (*Vaccinium*) in Massachusetts. Not yet collected in Illinois, but occurs in Massachusetts, Michigan, New Jersey, New York.

Rhinocapsus Uhler

No Illinois species; *Rhinocapsus vanduzeei* Uhler occurs from New England west to Michigan and south to North Carolina.

Microphylellus Reuter

KEY TO SPECIES

1. Hemelytra more or less pale; embolium, cuneus and basal half of corium almost colorless or yellowish; scutellum light, with median line black..... 2
Hemelytra uniformly blackish..... 3
2. Second antennal segment and femora uniformly pale..... **maculipennis** var. **maculipennis**, p. 41
Second antennal segment dark brown to black, femora with fuscous dots..... **maculipennis** var. **fuscicornis**, p. 41
3. Second antennal segment black, first segment pale on apical half.....
..... **nigricornis**, p. 41
Second antennal segment pale, or fuscous at base only..... 4

4. Length of second antennal segment less than width of pronotum at base 5
Length of second antennal segment equal to or greater than width of pronotum at base..... 7
5. First antennal segment yellowish, fuscous at base only; femora usually with fuscous dots on anterior face although these at times absent; length 3.30..... **modestus**, p. 41
First antennal segment black, or mostly black..... 6
6. Smaller, length 2.60-2.80; rostrum not extending beyond hind margins of middle coxae..... **tsugae**, p. 42
Larger, length 3.30; rostrum nearly attaining hind margins of posterior coxae..... **tumidifrons**, p. 42
7. Rostrum long, extending beyond hind coxae, reaching to near middle of venter; hind femora uniformly pale yellowish..... **longirostris**, p. 42
Rostrum shorter, reaching only to middle of hind coxae; hind femora with fuscous spots on anterior face..... **elongatus**, p. 42

Microphylellus modestus Reuter

Microphylellus modestus Reuter (1912a, p. 62).

ADULTS.—Length 3.30-3.50, width 1.30. Body ligneous black. Antennae and legs yellowish; first antennal segment fuscous at base, dark area sometimes extended from base toward middle. Hind femora usually with three or four fuscous dots near dorsal margin on anterior face, although these spots are frequently indistinct. Hemelytra mostly black, with membrane fuscous; apex of cuneus slightly paler, and veins pale fuscous.

HOST PLANTS.—Elm (*Ulmus*) and white oak (*Quercus alba*). In Illinois, specimens have been taken also on hazelnut (*Corylus americana*), hawthorn (*Crataegus mollis*) and hickory (*Carya* sp.). On elm the bugs are found most frequently among leaves curled by aphids, where they feed to some extent on honeydew. I have observed this species feeding on eggs of the elm leaf beetle, *Galerucella luteola* Mullsant.

KNOWN DISTRIBUTION.—From Minnesota to Texas and in all states eastward.

Illinois Records.—Fifty-one males and 57 females, taken May 23 to July 6, are from Algonquin, Dolson, Elizabethtown, Frankfort, Freeport, Galena, Galesburg,

Grand Detour, Hardin, Havana, Homer, Keithsburg, Maywood, Meredosia, Monticello, Mounds, Rockford, Rogers, Savanna, Ullin, Urbana, Waukegan, White Heath, White Pines Forest State Park, Willow Springs, Zion.

Microphylellus nigricornis Knight

Microphylellus nigricornis Knight (1923d, p. 457).

Not yet collected in Illinois; known to occur in Minnesota, New York, Ontario. It breeds on aster (*Aster macrophyllus*).

Microphylellus maculipennis Knight

Microphylellus maculipennis Knight (1923d, p. 456).

This is similar in size to *modestus* Reuter, but is distinguished by having pale markings on the dorsum.

MALE.—Length 3.40, width 1.30. Head black, width 0.69; vertex pale, 0.33. Rostrum yellowish, dark at base and apex and reaching hind margins of middle coxae. Antennae, first segment, length 0.30, yellow, fuscous at base; second, 0.86, yellow, fuscous at base and dusky at apex; third, 0.47, yellowish with dusky tinge; fourth, 0.33, pale fuscous. Pronotum, length 0.55, width at base 1.11; black, moderately shining; central area of disk and basal angles pale to yellowish; clothed with fine, yellowish pubescence. Scutellum pale yellowish; rather broad median line of scutellum and mesoscutum black. Hemelytra mostly black, with embolium, cuneus, and basal half of corium, usually straw colored to yellow but sometimes distinctly reddish; membrane fuscous, paler bordering apex of cuneus, veins pale only at apex of areoles. Legs pale to yellowish; basal half of hind coxae and tips of tarsi fuscous.

FEMALE.—Length 3.40, width 1.39; slightly more robust than male but very similar in coloration.

A form of this species having the antennae very dark, almost black, rather than light is known only from Maine; it has been described as *maculipennis fuscicornis* Knight (1923d, p. 457).

FOOD PLANT.—White oak (*Quercus alba*).

KNOWN DISTRIBUTION.—Illinois, Iowa, Maine, Minnesota, Texas.

Illinois Records.—FRANKFORT: June 8,

1933, Mohr & Townsend, 1 ♀. KEITHSBURG: June 8, 1932, Ross & Mohr, 1 ♂. MOUNDS: May 23, 1932, H. L. Dozier, 6 ♀. URBANA: May 28, 1934, Crystal Lake Park, Ross & Mohr, 1 ♂. WHITE HEATH: May 29, 1933, H. H. Ross, 1 ♂.

Microphylellus tsugae Knight

Microphylellus tsugae Knight (1923*d*, p. 456).

Known only from New York; breeds on hemlock (*Tsuga canadensis*).

Microphylellus elongatus Knight

Microphylellus elongatus Knight (1923*d*, p. 458).

This species is larger and longer than *modestus* Reuter; the length of the second antennal segment is equal to the width of the pronotum at its base.

MALE.—Length 4.00, width 1.44. Head width 0.68; vertex 0.33; head black, slightly paler at base of vertex. Rostrum reaching to middle of hind coxae. Antennae, first segment, length 0.28, yellowish, fuscous at base; second, 1.19, yellow, sometimes slightly dusky at base; third, 0.77, yellowish; fourth, 0.33, yellowish. Pronotum, length 0.62, width at base 1.16; black, pubescence pale to dusky. Scutellum, sternum and pleura black. Hemelytra black, strongly shining; emboliar margins nearly straight; pubescence pale to dusky. Legs straw colored to yellow; bases of hind and middle coxae, and tips of tarsi, black; hind femora with a row of fuscous spots on anterior face near dorsal margin. Venter black, shining.

FEMALE.—Length 3.80, width 1.40; very similar to male.

FOOD PLANT.—Sugar maple (*Acer saccharum*).

KNOWN DISTRIBUTION.—Illinois, Minnesota, New York.

Illinois Record.—ZION: July 6, 1932, Frison *et al.*, 1 ♂, 1 ♀.

Microphylellus longirostris Knight

Microphylellus longirostris Knight (1923*d*, p. 458).

This species is very similar to *elongatus* Knight, but has the rostrum distinctly longer: it extends beyond the hind coxae to near the middle of the venter.

MALE.—Length 3.80, width 1.25. Head black, width 0.61; vertex and area border-

ing eyes paler, 0.32. Rostrum reaching to middle of venter; yellowish, apex and basal segment black. Antennae, first segment, length 0.28, fuscous at base; second, 1.22, yellow; third, 0.86, yellowish to dusky; fourth, 0.44, dusky. Pronotum, length 0.64, width at base 1.11; black, strongly shining. Scutellum and ventral surface black. Hemelytra uniformly black, strongly shining; clothed with minute, dusky to black pubescence; emboliar margins nearly straight. Membrane and veins uniformly fuscous, apex of cuneus scarcely paler. Legs straw colored to yellowish, devoid of black spots; bases of hind coxae and apices of tarsi fuscous. Venter black, strongly shining.

FEMALE.—Length 3.90, width 1.34; very similar to male in form and coloration.

FOOD PLANT.—Hazelnut (*Corylus americana*); a single specimen was collected on hickory (*Carya ovata*).

KNOWN DISTRIBUTION.—Illinois, Iowa, Minnesota, New England, New York.

Illinois Records.—Thirty-two males and 42 females, taken June 3 to July 27, are from Algonquin, Antioch, Dolson, Elizabeth, Galena, Galesburg, Grandview, Hardin, Monticello, Oregon, Palos Park, White Pines Forest State Park.

Microphylellus tumidifrons Knight

Microphylellus tumidifrons Knight (1923*d*, p. 455).

Known only from Nova Scotia.

Microsynamma Fieber

Microsynamma bohemanni (Fallen)

Phytocoris bohemanni Fallen (1829, p. 106).

This species is distinguished from others by its broad, flat vertex with a basal carina.

MALE.—Length 4.00, width 1.60. Head width 0.84, vertex 0.43; vertex flat, basal carina distinct, an impressed mark evident on either side near eye; head mostly black, with juga and a broad area bordering front of eyes and sides of vertex, yellowish. Rostrum, length 1.51, extending nearly to tips of hind coxae. Antennae, first segment, length 0.23; second, 1.03; third, 0.52; fourth, 0.30; black. Pronotum, length 0.64, width at base 1.21; black, with area between and behind calli, and spot on either side in front of calli, pallid to yellowish. Dorsum clothed with fine, short, yellowish, simple pubes-

cence. Hemelytra pallid, translucent; apex of cuneus, apical half of corium and embolium, and clavus except in central area near tip of scutellum, dark brown to black; membrane pale brown, areoles and veins clear to yellowish. Legs black; tips of coxae, bases and tips of femora, and tibiae except for setigerous spots and spines, pale yellowish.

FEMALE.—Length 3.80, width 1.62. Head width, 0.86, vertex 0.45. Antennae, first segment, length 0.22; second, 0.92; third, 0.56; fourth, 0.39. Pronotum, length 0.62, width at base 1.21. More robust than male and usually lighter in color.

HOST PLANT.—Willow (*Salix* sp.).

KNOWN DISTRIBUTION.—British Columbia, Colorado, Illinois, Indiana, Iowa, Michigan, Newfoundland, New Jersey, New York, Ohio, Oregon, Vermont, Washington; Europe.

Illinois Record.—NORTHERN ILLINOIS: 1 ♂, 2 ♀.

Psallus Fieber

KEY TO SPECIES

1. Second antennal segment with four or five black spots, fig. 89; membrane with a conspicuous black mark on margin behind apex of cuneus; dorsum thickly covered with pale fuscous dots..... **seriatus**, p. 45
 Second antennal segment either black, or pale without distinct black spots. 2
2. Second antennal segment yellowish, black only at base... **amorphae**, p. 44
 Second antennal segment black. 3
3. Dorsum chiefly red; head, pronotal disk and scutellum flecked with fuscous; cuneus red with a narrow area at base light; length 3.60.
 **alnicola**, p. 44
 Dorsum black or fuscous, never distinctly flecked. 4
4. Femora pale or fulvous, or pale with black spots, but without black line on dorsal margin..... 5
 Femora black, or pale to yellowish with spots and a dark line on dorsal margin..... 6
5. Femora uniformly pale or yellowish; dorsum uniformly black; length 3.50..... **strobicola**, p. 45
 Femora fulvous, becoming dusky, with one or two black dots on dorsal aspect near apex, hind femora obscured with fuscous; length 2.60–3.00..... **bakeri**, p. 45
6. Length of second antennal segment more than three-fourths width of pronotum at base..... 7
 Length of second antennal segment less than three-fourths width of pronotum at base..... 11
7. Scutellum more or less pale at lateral margins, rarely entirely black; if scutellum black, cuneus paler or dusky at apex only; cuneus usually pale, sometimes slightly infuscated at apex; pale areas of legs and hemelytra tinged with reddish yellow.... . **alnicenatus**, p. 44
 Scutellum black; cuneus always partly black, frequently paler at base; pale areas of legs and hemelytra never tinged with reddish yellow..... 8
8. Rostrum reaching hind margins of posterior coxae; hemelytra uniformly black; femora black with pale apices; length 3.60.....
 **morrisoni**, p. 45
 Rostrum scarcely surpassing hind margins of middle coxae..... 9
9. Femora pale, a dark line forming on dorsal margin, anterior face with black spots and occasionally becoming uniformly dusky; tip of embolium and spot on base of corium almost colorless; length 4.50.
 **parshleyi**, p. 44
 Femora black but with light-colored apices..... 10
10. Length 2.90–3.10; deep black, with scalelike, silvery white pubescence.
 **astericola**, p. 45
 Length 3.50–4.00; very dark brown, hemelytra sparsely clothed with silvery, silky hairs intermixed with more erect, yellowish pubescence. .
 **fuscatus**, p. 44
11. Antennae entirely pale, pubescence dusky; legs black; apices of femora and tibiae pale, spines with small fuscous spots at bases.....
 **piceicola**, p. 44
 Antennae black, or at least first segment black..... 12
12. Legs dull yellow brown to dark brown; femora sometimes nearly black but never paler at apices, always tinged with brownish and reddish, hind

pair strongly thickened; coxae and tibiae dull yellow brown to dark brown, more or less tinged with reddish. **ancorifer**, p. 46
 Legs chiefly black; femora more slender, black, apices of front and middle pairs pale; coxae deep black; tibiae very light yellow to dull yellow brown, black spots at bases of spines. **drakei**, p. 46

Psallus parshleyi Knight

Psallus parshleyi Knight (1923*d*, p. 465).

The color aspect of this species is suggestive of *Plagiognathus obscurus fraternus* Uhler, but *Psallus parshleyi* is to be distinguished by the sericeous, semiscalelike pubescence on its pleura and dorsum.

MALE.—Length 4.50, width 1.70. Rostrum just reaching hind margins of middle coxae. Second antennal segment, length 1.26. Pronotum, width at base 1.37. Body black, basal half of cuneus, tip of embolium, and a small translucent spot near base of corium, pale. Legs pale yellowish; coxae fuscous at base; femora with dark line forming above and below on apical half, anterior face with three or four spots on apical half.

FEMALE.—Length 4.00, width 1.66; more robust than male but very similar in coloration.

FOOD PLANT.—Birch (*Betula pumila*).

KNOWN DISTRIBUTION.—Illinois, Massachusetts, Minnesota, New York.

Illinois Record.—ANTIOCH: July 5-7, 1932, Frison *et al.*, 23 ♂, 16 ♀.

Psallus fuscatus Knight

Psallus parshleyi var. *fuscatus* Knight (1923*d*, p. 466).

This species is allied to *parshleyi* Knight, but is distinguished by its smaller size and uniformly black femora and hemelytra.

MALE.—Length 3.70, width 1.40. Rostrum reaching posterior margins of hind coxae. Second antennal segment, length 0.95, black. Pronotum, width at base 1.08. Body sparsely clothed with silvery, silky hairs intermixed with more erect yellowish pubescence. Body black, paler areas appearing very dark brown, cuneus uniformly black like corium. Legs black, tips of femora and tibiae yellowish, tibial spines with prominent black spots at bases.

FEMALE.—Length 3.30, width 1.40; very similar to male in color and pubescence.

HOST PLANT.—Alder (*Alnus rugosa*).

KNOWN DISTRIBUTION.—Illinois and Minnesota.

Illinois Records.—DOLSON: June 25, 1932, Rocky Branch, Frison & Mohr, 1 ♀. EICHORN: June 24, 1932, on *Alnus rugosa*, Ross, Dozier & Park, 6 ♂, 10 ♀; June 13, 1934, DeLong & Ross, 2 ♂, 1 ♀.

Psallus amorphae Knight

Psallus amorphae Knight (1930*b*, p. 125).

This species is black, with the second antennal segment yellow except at the base.

ADULTS.—Length 3.00-3.20, width 1.20-1.30. Rostrum extending to hind margins of middle coxae. Second antennal segment, length 0.87, yellow, black at base; pronotum, width at base 0.99. Body black, dorsum and sides clothed with rather closely appressed silvery, silky to scalelike pubescence.

FOOD PLANTS.—Lead plant (*Amorpha canescens* and *A. fruticosa*).

KNOWN DISTRIBUTION.—Previously known only from Iowa and Minnesota.

Illinois Records.—GRAND DETOUR: July 2, 1932, Dozier & Mohr, 5 ♀. MOUNDS: May 23, 1932, H. L. Dozier, 1 ♂. OQUAWKA: June 13, 1932, H. L. Dozier, 2 ♂. STARVED ROCK STATE PARK: July 14, 1932, Dozier & Park, 1 ♀.

Psallus alnicola Douglas & Scott

Psallus alnicola Douglas and Scott (1865, p. 414).

Not taken in Illinois; known from Colorado, Idaho, Michigan, Minnesota, New Hampshire, New York, Oregon, Washington; Europe. Breeds on alder (*Alnus rugosa*) in cool, humid surroundings.

Psallus alnicenatus Knight

Psallus alnicenatus Knight (1923*d*, p. 466).

Not taken in Illinois; known from Michigan, Minnesota and New York.

Psallus piceicola Knight

Psallus piceicola Knight (1923*d*, p. 469).

This species is very dark brown, almost black; the hemelytra are more brownish than the rest of the dorsum, and the antennae and base of the cuneus are pale.

MALE.—Length 3.00, width 1.08. Head width 0.60, vertex at basal margin 0.34, narrowest point on front 0.27; strongly inclined vertically. Rostrum extending behind posterior coxae. Antennae with first segment pale; second, 0.66 in length, pale with dusky tinge. Pronotum, width at base 0.91. Hemelytra fusco-brownish to black, base of cuneus pale; clothed with golden to dusky pubescence intermixed with more closely appressed, silvery, woolly pubescence. Legs very dark brown, apices of femora and tibiae pale; tibial spines black, a fuscous spot at base of each.

FEMALE.—Length 2.90, width 1.30; more robust than male, but very similar in coloration; hemelytra usually more brownish.

FOOD PLANT.—Spruce (*Picea* sp.).

KNOWN DISTRIBUTION.—Illinois, Minnesota, New York.

Illinois Record.—ANTIOCH: July 5-7, 1932, on spruce, Frison *et al.*, 2 ♂, 2 ♀.

Psallus strobicola Knight

Psallus strobicola Knight (1923*d*, p. 467).

This species is very dark fuscous, almost black; the antennae and the legs, except for the coxae, are yellow; the body is clothed with closely appressed, silvery, silky pubescence.

MALE.—Length 3.50, width 1.33. Head width 0.72, vertex 0.33 measured across posterior corners of eyes; black; eyes reddish brown. Rostrum, length 1.25, reaching hind margins of posterior coxae, yellow, basal segment black. Antennae yellow; first segment, length 0.17; second, 0.97; third, 0.62; fourth, 0.39, slightly dusky. Pronotum, length 0.53, width at base 1.08. Hemelytra uniformly very dark fuscous; clothed with closely appressed, silvery, silky pubescence intermixed with more erect dark pubescence similar to that of the pronotum and scutellum; emboliar margins very slightly arcuate; membrane and veins uniformly fuscous, border of cuneus not perceptibly paler. Legs yellow, coxae almost black except at apex; tibial spines black without dark spots at bases.

FEMALE.—Length 3.10, width 1.36; more robust than male, but otherwise very similar.

FOOD PLANT.—Pine (*Pinus strobus*).

KNOWN DISTRIBUTION.—Illinois, Minnesota, New York, Ohio, Quebec.

Illinois Records.—GALENA: June 30, 1932, on *Pinus strobus*, Dozier & Mohr,

3 ♂, 4 ♀. KEITHSBURG: June 15, 1932, H. L. Dozier, 1 ♂, 4 ♀. MOUNT CARROLL: June 15, 1932, on *Pinus strobus*, Frison & Mohr, 2 ♂, 1 ♀. URBANA: June 11, 1915, 1 ♀. WHITE PINES FOREST STATE PARK: July 4, 1932, on grasses, Dozier & Mohr, 1 ♂; July 4, 1932, on *Pinus strobus*, Dozier & Mohr, 2 ♀.

Psallus astericola Knight

Psallus astericola Knight (1930*b*, p. 125).

Known only from Iowa. Breeds on prairie aster (*Aster sericeus*), which grows only on undisturbed, native prairie.

Psallus morrisoni Knight

Psallus morrisoni Knight (1923*d*, p. 464).

Not taken in Illinois; known from Massachusetts, Minnesota, New York.

Psallus bakeri (Bergroth)

Agalliaestes signatus Uhler (1895, p. 55). *Preoccupied*.

Chlamydatus bakeri Bergroth (1898, p. 35).

This species has previously been placed in the genus *Chlamydatus*, but its two types of pubescence, its longer antennae, and the form of its pseudarolia place it in *Psallus*.

ADULTS.—Length 2.60–2.90. General color fuscous to black, two spots on vertex and frequently base of cuneus paler. Legs yellowish to dusky yellow; hind femora frequently dark fuscous; femora with two or three black dots on dorsal surface before apex; tibiae pale, spines black with a prominent black spot at base of each. Clothed with pale, simple hairs intermixed on dorsum with some silky, silvery pubescence.

FOOD PLANT.—Sage brush (*Artemisia* sp.).

KNOWN DISTRIBUTION.—Occurs frequently in the states west of the Mississippi River.

Illinois Records.—GRAND DETOUR: July 12, 1934, DeLong & Ross, 3 ♂, 2 ♀. OREGON: July 4, 1932, on *Artemisia canadensis*, Dozier & Mohr, 10 ♂, 33 ♀. ROCKTON: July 5, 1932, Dozier & Mohr, 2 ♀.

Psallus seriatus (Reuter)

Atomoscelis seriatus Reuter (1876, p. 91).

This is the well-known cotton flea hopper, distinguished by its pale color, the black

spots on its second antennal segment, and the conspicuous black marks on the margin of the membrane, fig. 89.

MALE.—Length 3.10, width 1.30. Head width 0.69, vertex 0.34. Rostrum reaching

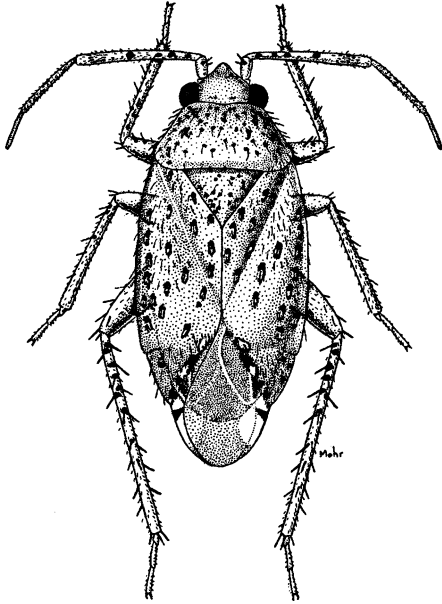


Fig. 89.—*Psallus seriatus*, ♀.

behind posterior coxae to third ventral segment. Antennae, first segment, 0.17, pale, a group of three setigerous black spots before apex, some of which form narrow annulations; second, 0.82, pale, with four or five conspicuous black spots on dorsal aspect. Pronotum, length 0.56, width at base 1.09; pale, finely dotted with fuscous. Hemelytra pale, dotted with small and a few larger fuscous spots. Dorsum clothed with simple fuscous hairs intermixed with deciduous, silvery scalelike pubescence which in part is arranged in tufts at posterior edge of larger fuscous spots; roughly handled specimens or old living adults may lose pubescence. Membrane clear and shaded with fuscous; a clear spot surrounding black mark on margin behind cuneus; veins white. Legs pale; femora dotted with fuscous; tibiae with two rows of black spines, each with a prominent black spot around base.

FEMALE.—Length 2.80, width 1.40; slightly more robust than male, but very similar in color and pubescence.

HOST PLANTS.—The nymphs and adults feed on the tiny flower buds of cotton just

as they appear, causing the buds to drop. The wild hosts of this insect may be several herbaceous weeds, but the preferred food plants appear to be several species of *Croton*, especially *C. texensis*. In Illinois, specimens have been taken on snowberry (*Symphoricarpos orbiculatus*), horse mint (*Monarda punctata*) and daisy (*Chrysanthemum* sp.), as well as on cotton and *Croton capitatus*.

KNOWN DISTRIBUTION.—*Psallus seriatus* is known from all the southern states and ranges northward into Nebraska and Colorado and westward into Arizona and southern California. Its range coincides rather closely with the distribution of the various species of *Croton*.

Illinois Records.—One hundred one males and 57 females, taken June 15 to Sept. 6, are from Centralia, Fulton, Golconda, Harrisburg, Havana, Keithsburg, Meredosia, Metropolis, Patoka, St. Anne.

Psallus ancorifer (Fieber)

Apocremnus ancorifer Fieber (1859, p. 336).

Not taken in Illinois; known only from New York and Pennsylvania.

Psallus drakei Knight

Psallus drakei Knight (1923d, p. 464).

Not taken in Illinois; known only from Colorado and New York.

Lepidopsallus Knight

KEY TO SPECIES

1. Rostrum extending beyond posterior coxae..... 2
 Rostrum not extending beyond posterior coxae..... 3
2. First and second antennal segments pale yellowish; sides of venter without scalelike pubescence.....
 **claricornis**, p. 47
 First antennal segment black, base of second dusky; sides of venter and pleura bearing scalelike pubescence.....
 **rostratus**, p. 47
3. First antennal segment pale yellow.. 4
 First antennal segment very dark brown or black..... 5
4. First antennal segment short, second segment six times as long as first segment; reddish color dominant,

- darkest forms brownish red.
 **miniatus**, p. 47
 First antennal segment longer, second
 segment four times as long as first
 segment; color brown to fuscous,
 never reddish. **nyssae**, p. 48
5. Combined lengths of third and fourth
 antennal segments greater than
 length of second segment; second
 antennal segment thickened in
 both sexes, cylindrical and as thick
 as first segment; black, length 2.60
 **minusculus**, p. 47
 Combined lengths of third and fourth
 antennal segments less than or
 scarcely equal to length of second
 segment; second antennal segment
 more slender in female, distinctly
 thinner on basal half and not so
 thick as first segment. 6
6. Color uniformly black; second an-
 tennal segment always black; scale-
 like pubescence silvery white.
 **rubidus** var. **atricolor**, p. 47
 Color black with reddish areas; second
 antennal segment usually light at
 apex, scalelike pubescence yellowish
 **rubidus** var. **rubidus**, p. 47

Lepidopsallus rubidus (Uhler)

Sthenarus rubidus Uhler (1895, p. 41).

MALE.—Length 3.20, width 1.50; ground color black; hemelytra reddish brown with fuscous; embolium and cuneus strongly reddish; membrane uniformly fuscous. Body clothed with pale yellowish, closely appressed, scalelike pubescence intermixed with more erect, dusky, simple pubescence. Femora fusco-brownish, tinged with reddish; tibiae brownish to reddish, beset with prominent black spines. Antennae fuscous to ferruginous; first segment, length 0.16; second, 0.64, its length two-thirds as great as width of head, apical three-fourths equal in thickness to first segment, but more slender on basal one-fourth, usually paler on apical half; third, 0.36; fourth, 0.31. Pronotum, length 0.62, width at base 2.38.

FEMALE.—Length 3.50, width 1.53; head narrower than in male; second antennal segment gradually becoming thicker toward apex, but not quite attaining thickness of first segment.

Specimens which are uniformly black in color, rather than not quite so, and having silvery rather than yellowish pubescence,

have been named *rubidus atricolor* Knight (1923*d*, p. 472). These were taken in company with typical specimens at Dolson.

FOOD PLANTS.—Willow (*Salix* sp.). A few specimens were taken in Illinois on plantain (*Plantago aristata*) and black locust (*Robinia pseudoacacia*).

KNOWN DISTRIBUTION.—Common in the eastern United States and Canada; also known from California, Colorado, Idaho, Texas, Utah, Washington.

Illinois Records.—Twenty-two males and 49 females, taken June 22 to Aug. 19, are from Browns, Decatur, Dolson, Eichorn, Elizabethtown, Galesburg, Golconda, Grand Detour, Grand Tower, Havana, Herod, Kansas, Meredosia, Savanna, Shawneetown, Starved Rock State Park, York.

Lepidopsallus claricornis Knight

Lepidopsallus claricornis Knight (1923*d*, p. 471).

Not taken in Illinois; known from New Jersey.

Lepidopsallus rostratus Knight

Lepidopsallus rostratus Knight (1923*d*, p. 470).

Not taken in Illinois; known from Iowa and Minnesota.

Lepidopsallus minusculus Knight

Lepidopsallus minusculus Knight (1923*d*, p. 472).

Not taken in Illinois; known from New York.

Lepidopsallus miniatus Knight

Lepidopsallus miniatus Knight (1926*b*, p. 226).

This species is distinguished by its reddish color and relative lengths of the first two antennal segments.

MALE.—Length 2.70, width 1.60. Head width 0.73, vertex 0.30. Rostrum reaching to middle of hind coxae. Antennae uniformly pale yellowish; first segment, length 0.13; second, 0.78; third, 0.34. Pronotum, length 0.56, width at base 1.21. General color uniform red to red with fuscous shading; membrane fuscous, veins red. Legs fusco-reddish; tips of femora and tibiae pale; spines and spots at bases black.

FEMALE.—Length 2.80, width 1.50. Head

width 0.77, vertex 0.36. Antennae pale yellowish; first segment, 0.17; second, 0.69. Pronotum, length 0.58, width at base, 1.23. Color more reddish than in male, sometimes pronotum and scutellum more fuscous than red. Clothed with silvery white, scalelike pubescence intermixed with simple, yellowish to fuscous pubescence.

FOOD PLANT.—Post oak (*Quercus stellata*).

KNOWN DISTRIBUTION.—Described from Florida, and now known from Illinois, Mississippi, Texas.

Illinois Records.—DONGOLA: May 10-12, 1917, 1 ♂, 1 ♀. DUBOIS: May 21-24, 1917, 2 ♂, 6 ♀. MEREDOSIA: May 29, 1917, 2 ♀.

Lepidopsallus nyssae Johnston

Lepidopsallus nyssae Johnston (1930, p. 299).

This is allied to *miniatus* Knight, but is distinguished by its pale brownish color and the relative lengths of the first and second antennal segments.

MALE.—Length 3.00, width 1.40. Head width 0.73, vertex 0.30. Rostrum just attaining posterior margins of middle coxae. Antennae pale yellowish, last two segments dusky; first segment, length 0.21; second, 0.82; third, 0.34; fourth, 0.23. Pronotum, length 0.61, width at base 1.21. General color pale brown to fuscous, never reddish as in *miniatus*; head, pronotum and scutellum dark fuscous to black; hemelytra pale brownish, sometimes darker; cuneus uniformly translucent like the corium. Clothed with silvery, scalelike pubescence intermixed with pale yellowish to fuscous simple pubescence. Legs dark brown; tibiae pale with black spines arising from brown spots.

FEMALE.—Length 3.00, width 1.60. Head width 0.79, vertex 0.37. Antennae uniformly pale yellowish; first segment, length 0.14; second, 0.67. Pronotum, length 0.67, width at base 1.26. Color much paler than in male, dorsum uniformly pale brownish except anterior half of pronotum and head, which are fuscous to blackish. Legs uniformly pale.

FOOD PLANT.—Black gum (*Nyssa sylvatica*).

KNOWN DISTRIBUTION.—Described from Texas. Now known in Illinois also.

Illinois Record.—ELIZABETH TOWN: May 27-31, 1932, H. L. Dozier, 1 ♂.

Reuteroscopus Kirkaldy

KEY TO SPECIES

- Membrane uniformly fuscous except for clear spot at apex of cuneus and smaller spot just beyond; scutellum and clavus black, fig. 90. **ornatus**, p. 48
 Membrane with many small, fuscous marks; scutellum and clavus yellowish, dotted with fuscous. **sulphureus**, p. 49

Reuteroscopus ornatus (Reuter)

Episcopus ornatus Reuter (1876, p. 90).

ADULTS.—Fig. 90. Length 3.40, width 1.30; general color yellowish green, pronotum with darker green; scutellum, clavus,

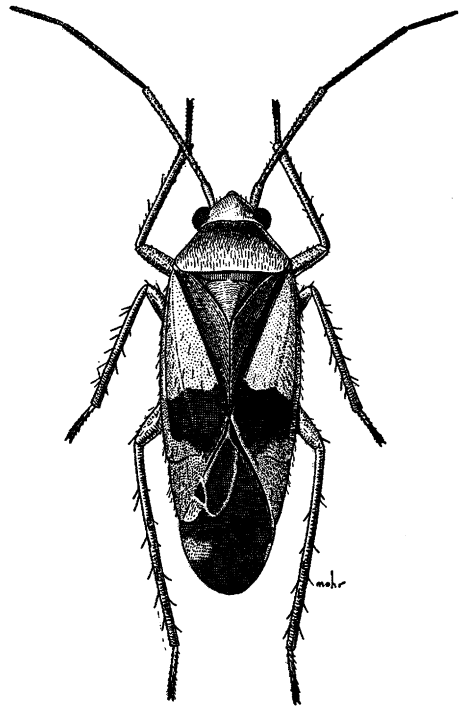


Fig. 90.—*Reuteroscopus ornatus*, ♀.

membrane, and bar across apex of corium, fuscous, dark color forming a well-marked Greek cross.

FOOD PLANTS.—Ragweed (*Ambrosia* sp.). A few Illinois specimens were taken also on red cedar (*Juniperus virginiana*), basswood (*Tilia* sp.) and lamb's quarter (*Chenopodium album*); the first two are undoubtedly "sitting" records.

KNOWN DISTRIBUTION.—Common in

North America east of the 100th meridian.

Illinois Records.—One hundred three males and 77 females, taken May 27 to Sept. 24, are from Albion, Alto Pass, Ashley, Bloomington, Cave-in-Rock, Champaign, Chicago, Darwin, Decatur, Delavan, Dolson, Dubois, East St. Louis, Elizabethtown, Fountain Bluff, Galena, Galesburg, Golconda, Grafton, Grand Detour, Grand Tower, Grandview, Grayville, Hardin, Havana, Herod, Kampsville, Kankakee, Kansas, Kappa, Karnak, Keithsburg, Lawrenceville, Metropolis, Monticello, Mounds, Mount Carmel, Muncie, Murphysboro, Oquawka, Palos Park, Pulaski, St. Joseph, Snyder, Springfield, Starved Rock State Park, Ullin, Urbana, York.

Reuteroscopus sulphureus (Reuter)

Psallus sulphureus Reuter (1907, p. 23).

ADULTS.—Length 3.30, width 1.18. General color yellow, sometimes with a greenish tinge. Inner apical angles of corium, tip of clavus, anal area of membrane, and spot on inner angle of cuneus, fuscous. Body clothed with yellowish to fuscous pubescence, base of each hair with a small fuscous spot, also sparsely set with small tufts of silvery scalelike hairs, arranged in series on median line and outer margins of head and pronotal disk, and present to some extent on clavus and corium; membrane with dark spots on a clear background, fuscous color forming a short transverse bar touching margin just beyond tip of cuneus, each side of this clear but with another, larger fuscous area situated just before apex; femora thickly speckled with small, pale fuscous spots.

HOST PLANTS.—I have collected this species on ragweed (*Ambrosia* sp.) and found it breeding on *Sida spinosa* in Georgia. Specimens were collected in Illinois on lamb's quarter (*Chenopodium album*) and snowberry (*Symphoricarpos orbiculatus*) as well as on ragweed.

KNOWN DISTRIBUTION.—This species is common in the southern states and appears to find its northern limits of distribution in central Illinois.

Illinois Records.—Twenty-two males and 29 females, collected June 5 to Oct. 2, are from Alton, Alto Pass, Ashley, Cave-in-Rock, Darwin, Dolson, Dongola, Dubois, Elizabethtown, Fairfield, Golconda, Hardin, Havana, Herod, Lawrenceville, Metropolis, Oquawka, Shawneetown, Vienna, York.

Criocoris Fieber

Criocoris saliens (Reuter)

Strongylothes saliens Reuter (1876, p. 88).

MALE.—Fig. 91. Length 2.70, width 1.40. Head and body black, shining, clothed with white scalelike pubescence intermixed with

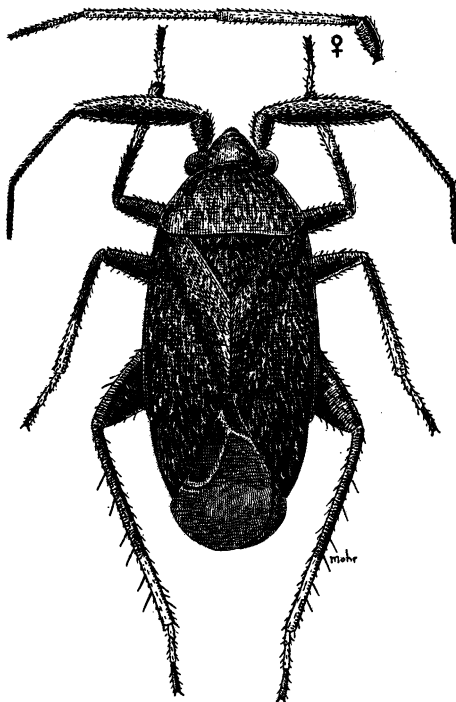


Fig. 91.—*Criocoris saliens*, ♂.

more erect pubescence; first and second antennal segments strongly thickened, thickness of second segment half as great as width of vertex.

FEMALE.—Length 3.00, width 1.40; black, pubescence similar to that of male; antennae yellowish brown, entire first segment and base of second, black; second segment slender, scarcely more than half as thick as first.

HOST PLANT.—Bedstraw (*Galium aparine*.)

KNOWN DISTRIBUTION.—California, Idaho, Illinois, Iowa, Kansas, Maryland, Massachusetts, Minnesota, New Jersey, New York, Ontario, Pennsylvania, Texas, Virginia, Washington.

Illinois Records.—ANTIOCH: July 5-7, 1932, Frison *et al.*, 1 ♂. ELIZABETHTOWN: May 27-31, 1932, H. L. Dozier, 1 ♀. GRAND TOWER: May 12, 1932, Frison, Ross

& Mohr, 6 ♂. HEROD: May 29, 1935, Ross & Mohr, 4 ♀. JONESBORO: May 6, 1932, on *Galium aparine*, H. L. Dozier, 16 ♂, 5 ♀. TEXAS CITY: May 12, 1936, Ross, Mohr & Burks, 1 ♂.

Rhinacloa Reuter

Rhinacloa forticornis Reuter

Rhinacloa forticornis Reuter (1876, p. 89).

This species is distinguished by its small size, scalelike pubescence and thickened second antennal segment.

MALE.—Length 2.20, width 0.95. Head width 0.65, vertex 0.26. Rostrum reaching apices of hind coxae, length 0.86. Antennae, first segment, length 0.13, thickness 0.06, black; second, length 0.56, thickness 0.07, cylindrical, clothed with fine, short pubescence, black; third, length 0.28, pale, slender; fourth, length 0.21, fuscous. Pronotum, length 0.36, width at base 0.85, clothed with fine, closely appressed, silvery, scalelike pubescence intermixed with dusky to black simple pubescence. General color fuscous to black, hemelytra paler at base, embolium with reddish spot at apex; membrane dusky. Legs brownish to fuscous; tibiae pale with spines and dots at bases of spines black.

FEMALE.—Length 0.21, width 1.00. Head width 0.60, vertex 0.30. Antennae, first segment, length 0.13, thickness 0.06; second, length 0.47, slender on basal half, clavate apically (thickness 0.07); third, length 0.30, slender, pale; fourth, length 0.20, fuscous. Pronotum, length 0.39, width at base 0.86. Color and pubescence very similar to those of male.

KNOWN DISTRIBUTION.—Common in Texas and westward. Rare in Illinois, Iowa and Missouri.

Illinois Record.—URBANA: June 29, 1914, C. A. Hart, 1 ♀.

Leucopoecila Reuter

Leucopoecila albofasciata Reuter

Leucopoecila albofasciata Reuter (1907, p. 26).

This species is distinguished by its peculiar antennae, fig. 92. The dorsum is dark with a pale fascia across the clavus.

MALE.—Fig. 92. Length 2.40, width 0.95. Head width 0.74, vertex 0.39, strongly vertical in position. Rostrum reaching slightly beyond hind coxae or to fourth ventral seg-

ment, length 1.04. Antennae, first segment, length 0.26, width 0.11, constricted at base, black; second, length 0.43, somewhat flattened, broader at base, width 0.12, clothed with short, black pubescence, ventral aspect black with an elongate, pale sensory pit which occupies nearly whole length of seg-

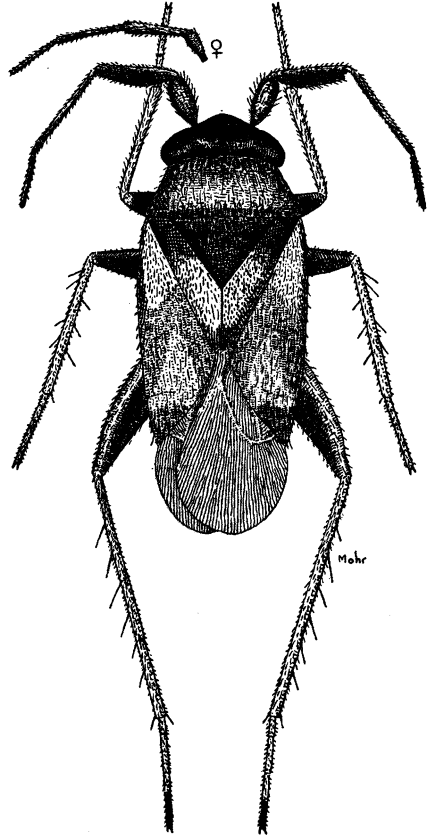


Fig. 92.—*Leucopoecila albofasciata*, ♂.

ment; third, length 0.52, slender, black; fourth, length 0.43, black. Pronotum, length 0.43, width at base 0.91. Scutellum distinctly convex above level of clavus. Dorsum clothed with pale, simple pubescence. General color black; a prominent, slightly irregular pale band extends across middle of clavus and basal half of corium; base of cuneus and a triangular spot just before on corium, pale; membrane fuscous, paler at base. Legs black, front and middle femora yellowish at apex, tibiae pale, spines black but without spots at bases, tarsi pale to fuscous, apical segment darker.

FEMALE.—Length 2.60, width 1.08. Head width 0.73, vertex 0.38. Antennae, first seg-

ment, length 0.17, width 0.06; second, length 0.49, width 0.06, more slender on basal half, no sensory pit evident; third, length 0.43; fourth, length 0.35, black. Form slightly more robust than that of male, but very similar in pubescence and coloration.

KNOWN DISTRIBUTION.—This species is widely distributed in the southern and southwestern United States. It has been reported as injurious to grass on golf greens at St. Louis, Mo., and about New York, N. Y.

Illinois Records.—ALTON: June 26, 1934, DeLong & Ross, 1 ♂. CARBONDALE: Aug. 17, 1891, sweepings from grape, G. H. French, 1 ♀. CAVE-IN-ROCK: Oct. 2, 1934, Frison & Ross, 1 ♂. FOUNTAIN BLUFF: Aug. 10, 1891, Hart & Shiga, 1 ♂. METROPOLIS: Aug. 18, 1891, sweepings from *Coreopsis* sp., etc., C. A. Hart, 1 ♀.

Lopus Hahn

No Illinois species; *Lopus decolor* (Fallen) occurs in Connecticut, District of Columbia, Maine, Maryland, Massachusetts, New Jersey, New York, Ontario, Quebec, Virginia. It breeds on sedges (*Juncus dudleyi* and other species).

Amblytylus Fieber

No Illinois species; *Amblytylus nasutus* (Kirschbaum) occurs in Indiana, Massachusetts, Michigan; Europe.

Atractotomus Fieber

No Illinois species; *Atractotomus crataegi* Knight is known from Iowa.

Macrotylus Fieber

KEY TO SPECIES

- Chiefly green, ventral surface yellowish, femora black along dorsal margin, fig. 93; length 2.30. **amoenus**, p. 51
- Uniformly black, membrane with four white spots; length 3.00. **sexguttatus**, p. 51

Macrotylus amoenus Reuter

Macrotylus amoenus Reuter (1909, p. 75).

ADULTS.—Fig. 93. Length 2.30, width 0.80; yellowish green, hemelytra darker green; first and second antennal segments

black, apices white; tibiae black; femora with black bar on dorsal margin; cuneus opaque white with greenish tint, an oblique

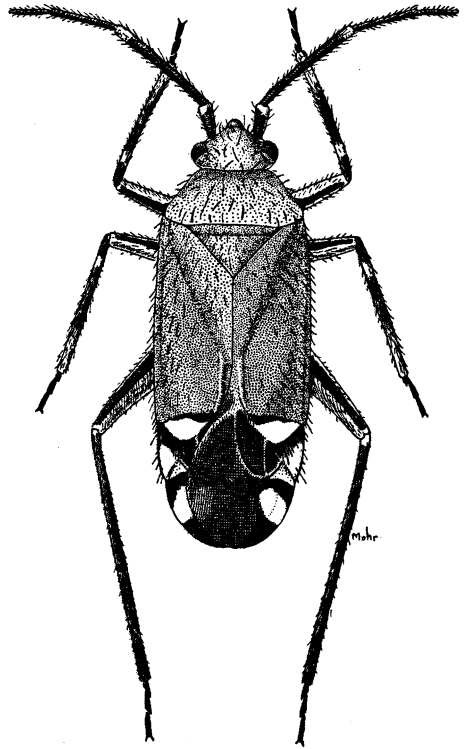


Fig. 93.—*Macrotylus amoenus*, ♀.

black bar across middle; membrane fuscous, a clear spot on either side near margin.

HOST PLANT.—New England aster (*Aster novae-angliae*).

KNOWN DISTRIBUTION.—Originally described from Connecticut and later found in Rhode Island and the Delaware Water Gap.

Illinois Records.—EVERGREEN PARK: July 1, 1935, Ross & DeLong, 1 ♀; Aug. 23, 1934, Ross & DeLong, 1 ♀. GRAYSLAKE: June 10, 1936, breeding on *Aster novae-angliae*, Ross & Burks, 59 ♂ 51 ♀. OAK LAWN: July 1, 1936, DeLong & Ross, 3 ♂ 4 ♀.

Macrotylus sexguttatus (Provancher)

Amblytylus sexguttatus Provancher (1887, p. 150).

Not taken in Illinois; known from Connecticut, Michigan, Minnesota, New York, Ontario, Pennsylvania. Host plant, aster (*Aster undulatus*).

Orectoderus Uhler**Orectoderus obliquus Uhler**

Orectoderus obliquus Uhler (1876, p. 320).

MALE.—Length 8.00, width 2.30. Head elongate, inclined, width 1.22, vertex 0.60. Rostrum extending to near apex of middle coxae. Antennae with first segment yellowish, length 0.47; second, 2.42, apical one-third distinctly thickened, yellowish to orange, thick part black; third, 1.55; fourth, 0.86; last two segments orange. Pronotum, length 1.30, width at base 1.81; lateral margins rounded, slightly concave. General color black, shining; legs yellowish to orange colored. Body sparsely clothed with short, yellowish pubescence. A color variation has the basal half of cuneus and basal one-third of corium white.

FEMALE.—Length 6.00, width of abdomen 2.40. Brachypterous, antlike in form, head broader than pronotum; hemelytra greatly reduced, extending to base of abdomen, there turning upward, the tips vertical and tapering to a point; two basal segments of abdomen constricted into a pedicel, the remaining segments forming a globose portion, the pleural fold prominent. General color piceous to black; antennae yellowish to orange, tips of second and third segments blackish.

HABITS.—Occurs on the ground among grasses and associated with ants.

KNOWN DISTRIBUTION.—Alberta, Colorado, Connecticut, Illinois, Maine, Manitoba, Massachusetts, Montana, New Brunswick, New Mexico, New York. Uhler (1876, p. 320) records this species from Illinois.

Teleorhinus Uhler

No Illinois species; *Teleorhinus tephrosicola* Knight is known from Missouri, New Jersey, New York, and may eventually be taken in Illinois. It breeds on hoary pea (*Tephrosia* sp.).

Coquillettia Uhler**Coquillettia amoena (Uhler)**

Orectoderus amoenus Uhler (1877, p. 426).

MALE.—Length 6.40, width 1.77. Head width 0.90, vertex 0.41. Antennae dark brown; first segment, length 0.38; second, 2.20; third, 2.00; fourth, 0.95. Pronotum,

length 0.99, width at base 1.43. General color dark orange brown; abdomen, tarsi and second antennal segment becoming fuscous; basal half of corium transparent, apical part bright orange brown, but with a slender dark brown margin; basal one-third of cuneus white, slightly translucent; membrane and apical two-thirds of cuneus very dark brown, almost black.

FEMALE.—Length 5.50, wingless; antlike in form, head wider than pronotum; abdomen with first two segments constricted to form a pedicel, remaining segments forming a globose, polished, minutely and sparsely haired gaster with conspicuous pleural fold. General color brown; third and fourth antennal segments and apex of second, tarsi, and apices of tibiae, fuscous to black; globose portion of abdomen, and tergite of second segment, dark chestnut to pitchy black.

KNOWN DISTRIBUTION.—Florida, Illinois, Iowa, New Mexico, North Carolina, Texas. The only Illinois record is that in the original description where Uhler stated: "Other specimens have been secured in . . . Illinois."

Occurs on high prairie among grasses and appears to be associated with ants, such as *Formica (Neoformica) pallide-fulva* var. *incerta* Emory. The wingless female bugs resemble this ant in form and color so nearly that one must look rather closely to separate them.

DICYPHINAE**KEY TO GENERA**

1. Eyes large, postocular space of head less than half lateral width of an eye; first antennal segment always short, fig. 94. . . . **Cyrtopeltis**, p. 53
Eyes small, postocular space much longer, figs. 95, 97; or first antennal segment very long, fig. 98. 2
2. Hemelytra hyaline, completely transparent and glassy, with a well-defined, red or fuscous Y-shaped mark, fig. 98; pseudarolia absent, fig. 32; form broader.
. **Hyaliodes**, p. 56
Hemelytra opaque or at least milky, and with brown, scattered spots or widely suffused brownish areas; pseudarolia prominent, figs. 29, 53; form narrower, fig. 97. 3
3. Pronotal disk with an arcuate, deep

- furrow across middle at junction of wide and narrow portions, fig. 97. **Dicyphus**, p. 53
- Pronotal disk without such a furrow, fig. 96. 4

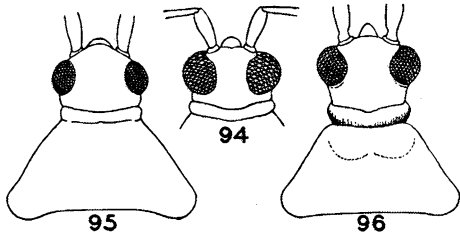


Fig. 94.—Head of *Cyrtopeltis tenuis*.
 Fig. 95.—Head of *Macrolophus separatus*.
 Fig. 96.—Head and pronotum of *Dicyphus agilis*.

- 4. Head mostly black; pronotum brown or black, at least on sides. **Dicyphus**, p. 53
- Head and pronotum almost entirely greenish yellow. **Macrolophus**, p. 55

Cyrtopeltis Reuter

No Illinois species; *Cyrtopeltis varians* (Distant) occurs in Arizona, California, Florida, Georgia, Mississippi, Missouri, South Carolina, Texas; Mexico and Central America; Puerto Rico and Grenada. It is known to breed on cultivated tomatoes, but in the wild state it feeds probably on related plants. It has been reported to be a tomato pest in Arizona, Georgia and Mississippi.

Dicyphus Fieber

KEY TO SPECIES

- 1. Length not over 3.00; corium with large black spot near apex. **minimus**, p. 54
- Length more than 4.00; corium variously marked but without a large black spot near apex. 2
- 2. Head entirely and pronotum mostly dark brown to black; pronotum usually with a pale median stripe. **agilis**, p. 53
- Head with at least vertex behind eyes pale; pronotum in greater part dull yellow or reddish with only sides darkened. 3

- 3. Length of second antennal segment subequal to both maximum width and maximum length of pronotum. **vestitus**, p. 53
- Length of second antennal segment at least one-third greater than maximum width of pronotum and at least one-half greater than maximum length of pronotum. 4
- 4. Second antennal segment uniformly black; scutellum mostly black; femora without reddish dots. **gracilentus**, p. 54
- Second antennal segment with basal two-thirds pale; scutellum entirely reddish or yellowish; femora with numerous reddish dots. 5
- 5. Elytra with numerous reddish streaks; length of postocular space subequal to distance between eyes. **famelicus**, p. 54
- Elytra without reddish streaks; length of postocular space slightly more than one-half distance between eyes. **discrepans**, p. 54

Dicyphus agilis (Uhler)

Idolocoris agilis Uhler (1877, p. 425).

MALE.—Length 3.40, width 0.90. General color pale yellowish; head, thorax and second segment of antennae chiefly black; hemelytra pale, lightly marked with fuscous, sometimes tinged with red.

FEMALE.—Length 4.50, width 1.10.

FOOD PLANT.—Raspberry (*Rubus odoratus* and doubtless others). In Illinois it was collected on walnut (*Juglans nigra*) and butternut (*J. cinerea*), but these are certainly "sitting" records.

KNOWN DISTRIBUTION.—Maine westward to British Columbia and southward to Virginia, through Illinois and Iowa.

Illinois Records.—Seven males and 16 females, taken June 2 to July 2, are from Algonquin, Dolson, Rocky Branch, Galesburg, Grand Detour, Grand View, Hardin, Manito, Savanna, Sheldon, Urbana.

Dicyphus vestitus Uhler

Dicyphus vestitus Uhler (1895, p. 46).
Dicyphus notatus Parshley (1922, p. 16).

ADULTS.—Length 3.80, width 1.20. Head width 0.60, vertex 0.26. Rostrum reaching to base of hind coxae. First antennal segment, length 0.36, reddish, black on base;

second, 0.91, yellowish, apical one-fourth black. Pronotum, length 0.58, width at base 0.95, basal margin deeply concave. General color pale, shaded with fuscous, scutellum black, basal angles pale; ventral surface black, shining. Legs pale, femora with small fuscous points.

KNOWN DISTRIBUTION.—Colorado, Illinois, Iowa, Minnesota, Ohio, South Dakota.

Illinois Records.—ALGONQUIN: Nov. 4, 1895, 1 ♀; May 8, 1897, 1 ♀. APPLE RIVER CANYON STATE PARK: June 2, 1933, Ross & Townsend, 1 ♀. BLOOMINGTON: July 18, 1932, T. H. Frison, 1 ♂, 3 ♀. CARY: May 14, 1936, Ross & Mohr, 1 ♀. FOUNTAIN BLUFF: Aug. 10, 1891, Hart & Shiga, 1 ♀. URBANA: Nov. 2, 1887, sweeping from grass and evergreens in arboretum, C. A. Hart, 1 ♀; April 30, 1892, in woods, Hart & Marten, 1 ♀. WILLOW SPRINGS: July 16, 1911, A. B. Wolcott, 2 ♂, 1 ♀, FM.

Dicyphus famelicus (Uhler)

Idolocoris famelicus Uhler (1878, p. 413).

ADULTS.—Length 4.80, width 1.20. Rostrum extending to second abdominal sternite. First antennal segment, length 0.47; second, 1.43, yellowish, apical one-third dark reddish. Pronotum, length 0.62, width at base 0.86, strongly sulcate on base. General color pale yellowish; head and thorax dull reddish; hemelytra and scutellum with dull reddish markings; membrane infuscated; veins and tip of cuneus reddish.

FOOD PLANT.—Raspberry (*Rubus odoratus*).

KNOWN DISTRIBUTION.—Illinois, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Ontario, Pennsylvania, Vermont, West Virginia, Wisconsin.

Illinois Record.—SAVANNA: July 11, 1917, 1 ♂.

Dicyphus minimus Uhler

Dicyphus minimus Uhler (1899, p. 59).

Not taken in Illinois; known from California, Colorado, District of Columbia, New Mexico.

Dicyphus discrepans Knight

Dicyphus discrepans Knight (1923*d*, p. 477).

Not yet collected in Illinois; known to occur in British Columbia, Michigan, Minnesota, New Hampshire, New York, North

Dakota, Oregon, Washington. Feeds on aster (*Aster* sp.).

Dicyphus gracilentus Parshley

Dicyphus gracilentus Parshley (1922, p. 21).
Dicyphus vestitus Blatchley (1926*b*, p. 910)
not Uhler. *Misidentification.*

ADULTS.—Fig. 97. Length 4.50, width 1.25. Head width 0.60, vertex 0.21. Rostrum reaching to second abdominal sternite.

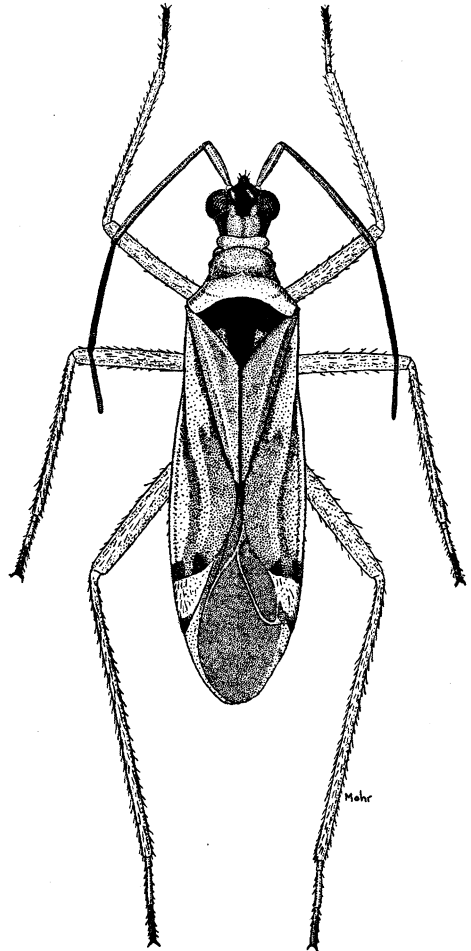


Fig. 97.—*Dicyphus gracilentus*.

First antennal segment, 0.43; second, 1.25, black. Pronotum, length 0.65, width at base 0.99, basal margin deeply concave. General color pale to yellowish, shaded with fuscous; scutellum and mesoscutum dull black, basal angles of scutellum yellowish; sternum and propleura dark brown, strongly shining.

Legs uniformly pale yellowish, without spots.

FOOD PLANT.—Leafcup (*Polymnia canadensis*).

KNOWN DISTRIBUTION.—Originally described from Illinois and known also from Indiana and Ohio.

Illinois Records.—Sixty-seven males and 66 females, taken April 4 to Oct. 29, are from Apple River Canyon State Park, Bloomington, Cave-in-Rock, Kappa, Oakwood, Savanna, Urbana, Zion.

Macrolophus Fieber

KEY TO SPECIES

- 1. Length of first antennal segment equal to or slightly greater than width of head across eyes; length of second segment distinctly greater than basal width of pronotum. **tenuicornis**, p. 56
- Length of first antennal segment less than width of head across eyes. 2
- 2. Postocular space of head nearly equal to lateral width of an eye; a fuscous stripe present at dorsal margin of eye; second antennal segment with apical one-fourth black; basal two-thirds of corium without fuscous points at bases of hairs except one row bordering claval suture. **brevicornis**, p. 55
- Postocular space of head little more than half lateral width of an eye; second antennal segment with a narrow fuscous area at apex; corium with three or four rows of fuscous points on basal two-thirds. **separatus**, p. 55

Macrolophus separatus (Uhler)

Dicyphus separatus Uhler (1894, p. 194).

MALE.—Length 4.30. Head width 0.54, vertex 0.28; lateral width of an eye 0.20, space between eye and pronotal collar, 0.11; without trace of a fuscous vitta behind dorsal margin of eye. Rostrum, length 1.79, scarcely attaining posterior margins of hind coxae. First antennal segment, length 0.38, black; second, 1.17, yellowish, narrow area at apex black; third, 1.28, slender, yellowish to dusky; fourth, 0.51, fusco-brownish. Pronotum, length 0.66, width at base 1.06.

FEMALE.—Length 4.20. Head width 0.56,

vertex 0.29; lateral width of an eye 0.20, space between eye and pronotal collar 0.11. First antennal segment, length 0.34; second, 1.00, practically equal to width of pronotum at base; third, 1.20; fourth 0.52.

FOOD PLANTS.—Found breeding on *Gerardia pedicularia*; also occurs in Illinois on leafcup (*Polymnia* sp.).

KNOWN DISTRIBUTION.—Florida, Illinois, Indiana, Maryland, New York, Ohio.

Illinois Records.—BLOOMINGTON: July 18, 1932, T. H. Frison, 1 ♀. CHICAGO: Aug. 4, W. J. Gerhard, 1 ♂, FM. GOLCONDA: June 22, 1932, Ross, Dozier & Park, 1 ♂. HARDIN: June 5-9, 1932, H. L. Dozier, 2 ♂, 1 ♀. KANKAKEE: Sept. 19, 1930, on *Gerardia pedicularia*, Frison & Ross, 28 ♂, 65 ♀. ST. ANNE: Aug. 4, 1936, Frison & Burks, 1 ♀. URBANA: Aug. 25, 1930, H. H. Knight, 8 ♂, 5 ♀; 1930, on *Polymnia* sp., T. H. Frison, 13 ♂, 10 ♀. ZION: July 6, 1932, T. H. Frison, 6 ♂, 5 ♀.

Macrolophus brevicornis Knight

Macrolophus brevicornis Knight (1926i, p. 315).

This species is suggestive of *tenuicornis* Blatchley, but the antennae are distinctly shorter, with the first segment not equal to the width of the head; it is distinguished from *separatus* (Uhler) as shown in the key.

MALE.—Length 3.60, width 0.96. Head width 0.48, vertex 0.26; lateral width of an eye 0.16, or a trifle greater than space (0.11) between eye and base of head where collar normally fits. Rostrum reaching to middle of hind coxae, length 1.34. Antennae, first segment, length 0.34, scarcely equal to width of vertex plus dorsal width of an eye; second, 0.88, being a trifle greater than width of pronotum at base, apical one-fourth black; third, 1.03; fourth, 0.43. Pronotum, length 0.54, width at base 0.84.

General coloration usually lemon yellow, sometimes greenish yellow; head with a fuscous stripe behind dorsal margin of eye; hemelytra with fuscous points more distinct than in *tenuicornis*, basal two-thirds of corium without fuscous points at bases of hairs, except one row bordering claval suture.

FEMALE.—Head width 0.47, vertex 0.25; lateral width of an eye 0.16, space between eye and pronotal collar 0.11. Antennae, first segment, length 0.33; second, 0.75, not equal to width of pronotum at base; third, 1.00;

fourth, 0.38. Pronotum, length 0.54, width at base 0.84.

FOOD PLANT.—In Iowa found breeding on an unidentified milkweed (*Asclepias* sp.).

KNOWN DISTRIBUTION.—Illinois, Iowa, Kansas, Maryland, New Jersey.

Illinois Records.—HARDIN: June 5-9, 1932, H. L. Dozier, 2 ♂, 1 ♀. VIENNA: May 18, 1932, H. L. Dozier, 3 ♀.

Macrolophus tenuicornis Blatchley

Macrolophus tenuicornis Blatchley (1926*b*, p. 913).

MALE.—Length 4.20, width 0.91. Head width 0.47, vertex 0.26; lateral width of an eye 0.17, space between eye and pronotal collar 0.13. Rostrum reaching to near posterior margin of hind coxae. Antennae, first segment, length 0.56, pale, apex black; second, 1.43, pale, apex black, length greater than basal width of pronotum plus width of head. Pronotum, length 0.60, width at base 0.78. General coloration greenish yellow, darkened with fuscous, nearly as in *separatus* (Uhler), but fuscous points on corium much fainter and confined to inner half; longitudinal fuscous stripe behind dorsal margin of each eye.

FEMALE.—Length 4.00, width 1.00. Head width 0.43, vertex 0.26. Antennae, first segment, length 0.47; second, 1.17. Pronotum, length 0.60, width at base 0.82. Very similar to male in form and coloration.

FOOD PLANT.—Leafcup (*Polymnia canadensis*).

KNOWN DISTRIBUTION.—Illinois and Indiana.

Illinois Records.—ALGONQUIN: Aug. 7, 1930, on *Polymnia canadensis*, Frison & Knight, 1 ♂. FERN CLIFF: Aug. 3, 1934, DeLong & Mohr, 1 ♂, 3 ♀. GOLCONDA: July 25, 1930, on *Polymnia canadensis*, Knight & Ross, 52 ♂, 5 ♀. MORRIS: July 19, 1883, Webster, 1 ♂. URBANA: 1930, on *Polymnia* sp., T. H. Frison, 1 ♂, 1 ♀.

Hyaliodes Reuter

KEY TO SPECIES

- 1. Collar, calli and areas lateral to calli very dark brown or black, median pronotal line always light, fig. 98; length of first antennal segment of male equal to maximum width of pronotum; length of first antennal

segment of female four-fifths as great as maximum width of pronotum.....**harti**, p. 57

Entire pronotum almost colorless; or pronotum with collar, calli, and a broad median mark extending from anterior to posterior margins, dark brown or black; or pronotum with a vague dark mark on median line at posterior margin; length of first antennal segment in either sex not more than three-fourths as great as maximum width of pronotum..... 2

- 2. Broad, median, dark brown or black mark extending from anterior to posterior margins of pronotum....

vitripennis var. **discoidalis**, p. 56

Pronotum without broad, median, longitudinal, dark mark..... 3

- 3. Length of first antennal segment equal to or only slightly greater than width of head measured across eyes.....**brevis**, p. 58

Length of first antennal segment much greater than width of head across eyes; at least two-thirds as great as maximum width of pronotum.....

vitripennis var. **vitripennis**, p. 56

Hyaliodes vitripennis (Say)

Capsus vitripennis Say (1832, p. 24).

Length 4.80, width 1.70; hemelytra hyaline, glassy, with black or red marks bordering scutellum, inner edge of clavus and corium, and extending across apex of corium to lateral margin; also dark on membrane, veins and tip of cuneus; pronotum usually almost entirely colorless; antennae variously marked with red.

In some specimens the median area of the posterior portion of the pronotum tends to be fuscous; in others it may be dark brown or black. Other specimens may have this dark mesal area extending the full length of the pronotum. These dark extremes constitute the variety *discoidalis* Reuter (1909, p. 61).

HABITS.—Occurs on several plants; frequent on grape (*Vitis* sp.); predacious on plant lice.

KNOWN DISTRIBUTION.—Originally described from Indiana and Pennsylvania and since recorded from several eastern states and southern Canada.

Illinois Records.—Forty-eight males and 95 females, taken May 24 to Sept. 10, are

from Alton, Antioch, Ashley, Bluff, Cairo, Clay City, Danville, Darwin, De Soto, Dolson, Dongola, Dubois, Eichorn, Elizabethtown, Evanston, Fairfield, Fort Sheridan, Galesburg, Grantsburg, Hardin, Harrisburg, Havana, Herod, Kampsville, Karnak, Marshall, McHenry, Meredosia, Metropolis, Monticello, Olive Branch, Oregon, Parker, Pulaski, Quincy, Rock Island, Shawneetown, Starved Rock State Park, Urbana, West Pullman, White Heath, Willow Springs, Zion.

***Hyaliodes harti* new species**

This is distinguished from *vitripennis* (Say) by the longer first antennal segment,

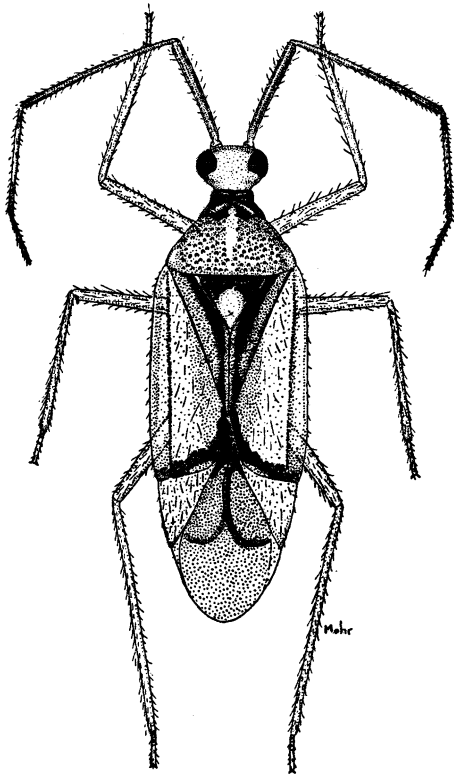


Fig. 98.—*Hyaliodes harti*.

which, in the male, is equal to the width of the pronotum at base.

MALE.—Length 4.40, width 1.40. Head, width 0.73, vertex 0.26. Rostrum just attaining posterior margins of middle coxae, length 1.20. Antennae, first segment, length 1.10, bright red; second, 1.69, reddish to black; third, 1.12, black; fourth, 0.60. Pro-

notum, length 0.82, width at base 1.12. General color pale, translucent; head and body yellowish; calli, collar, scutellum except apex, mesoscutum, and inner margin of clavus, black; apex of scutellum white; apex of corium, and tip of embolium, red; cuneus and membrane clear, anal angles fuscous, veins red to fuscous. Legs pale to yellowish.

FEMALE.—Fig. 98. Length 4.90, width 1.60. Head width 0.71, vertex 0.32. Antennae, first segment, length 1.08; second, 1.77. Pronotum, width at base 1.34. Very similar to male in form and coloration.

Holotype, male.—Harrisburg, Ill.: June 25, 1932, Ross, Dozier & Park.

Allotype, female.—Same data as for holotype.

Paratypes.—ILLINOIS.—Same data as for holotype, 11 ♂, 3 ♀. NORTHERN ILLINOIS: 1 ♂, 3 ♀. ALTON: July 19-21, 1932, Ross & Dozier, 1 ♀. ANNA: June 27, 1909, 2 ♀. ASHLEY: Aug. 7, 1917, 3 ♂, 3 ♀. BEVERLY HILLS: Sept. 11, 1907, E. B. Chope, 1 ♀; July 13, 1908, W. J. Gerhard, 1 ♂. DIXON SPRINGS: June 23, 1932, Ross, Dozier & Park, 1 ♂. DOLSON: Sept. 30, 1935, T. H. Frison, 1 ♀. DUBOIS: July 2, 1909, 2 ♂. EICHORN: June 24, 1932, Hick's Branch, on *Alnus rugosa*, Ross, Dozier & Park, 1 ♂. ELIZABETHTOWN: June 22-24, 1932, Ross, Dozier & Park, 1 ♂; July 8, 1935, Ross & DeLong, 2 ♀. GALENA: June 30, 1932, Dozier & Mohr, 1 ♀. GALESBURG: July 24, 1892, Stromberg, 2 ♂, 2 ♀. GEFF: June 12, 1934, DeLong & Ross, 1 ♀. GLENVIEW: July 19, 1931, A. R. Park, 1 ♀. HEROD: June 23, 1927, T. H. Frison, 1 ♂; June 24, 1932, Ross, Dozier & Park, 1 ♀. JOLIET: July 31, 1930, Frison & Knight, 2 ♀. KARNAK: June 23, 1932, Ross, Dozier & Park, 1 ♀. LA GRANGE: Sept. 11, 1907, 1 ♂. LA RUE: July 11, 1935, DeLong & Ross, 1 ♂, 1 ♀. LAWRENCEVILLE: Sept. 7, 1933, Ross & Mohr, 1 ♀. MAKANDA: June 26, 1909, 1 ♂. MARSHALL: July 23, 1932, Dozier & Park, 1 ♂. METROPOLIS: Aug. 20, 1916, 1 ♀. MONTICELLO: June 28, 1914, 1 ♀. NORMAL: July 22, 1884, on black walnut, 1 ♀; July 26, 1884, on leaves of maple, 1 ♀. OAKWOOD: July 22, 1930, Hottes & Tauber, 1 ♀; Oct. 6, 1930, T. H. Frison, 1 ♀. OLIVE BRANCH: Oct. 2, 1909, W. J. Gerhard, 1 ♂. QUINCY: Aug. 14, 1889, "sweeping along shore of Mississippi R.," C. A. Hart, 1 ♀. ROCKFORD: July, 1932, Dozier & Mohr, 1 ♀. ROCK ISLAND: July 7, 1934, DeLong & Ross, 1 ♂. ST.

ANNE: July 22, 1935, Ross & DeLong, 1 ♀. SPRINGFIELD: July 12, 1932, T. H. Frison, on *Quercus* sp., 3 ♂, 7 ♀. STARVED ROCK STATE PARK: July 14, 1932, Dozier & Park, 5 ♂, 16 ♀. TAMAROA: Sept. 22, 1882, 1 ♀. TEMPLE HILL: June 24, 1936, DeLong & Ross, 1 ♂, 2 ♀. URBANA: Sept. 27, 1892, C. A. Hart, 1 ♀; July 21, 1889, "sweeping in Univ. forestry," C. A. Hart, 1 ♀; Oct. 8, 1889, in woods, Marten, 1 ♀; June 23, 1908, 1 ♀; Aug. 23, 1917, 1 ♀; Aug. 11, 1932, Knight & Ross, 1 ♂, 1 ♀; Sept., 1932, T. H. Frison, 1 ♂. WARREN: Aug. 22, 1935, DeLong & Ross, 1 ♂. WHITE HEATH: July 11, 1915, 1 ♀; July 4, 1933, H. H. Ross, 1 ♂. WILLOW SPRINGS: June 27, 1905, A. B. Wolcott, 1 ♂.

GEORGIA.—EXPERIMENT: Aug. 6, 1929, T. L. Bissell, 1 ♂.

IOWA.—AMES: July 31, 1 ♀; Aug. 1, 1932, F. Andre, 1 ♀.

MISSOURI.—SPRINGFIELD: July 18, 1915, H. H. Knight, 4 ♀.

NEW YORK.—BATAVIA: July 30, 1916, H. H. Knight, 2 ♂. ITHACA: July 23, 1 ♀; July 26, 1916, H. H. Knight, 2 ♂.

NORTH CAROLINA.—RALEIGH: July, 1909, F. Sherman, 1 ♂.

NORTH DAKOTA.—DICKENSON COUNTY: July 23, 1925, E. D. Ball, 1 ♀. TRAIL COUNTY: July 19, 1923, A. A. Nichol, 1 ♀.

ONTARIO.—PARRY SOUND: Aug. 7, 1915, H. S. Parish, 1 ♂, 2 ♀.

WISCONSIN.—HAYWARD: Aug. 15, 1932, Moose Lake, T. H. Frison, 1 ♂.

Hyaliodes brevis new species

This species is distinguished by its short first antennal segment which, in the female, does not exceed the width of the head across the eyes and, in the male, exceeds the width of the head only very slightly; the body is shorter and more nearly ovate than in *vitripennis* (Say).

MALE.—Length 4.00, width 1.80. Head width 0.69, vertex 0.32. Rostrum scarcely reaching base of middle coxae, length 0.95. Antennae, first segment, length 0.70, pale yellowish, becoming reddish at apex; second, 1.43, fuscous to black, slightly paler at middle; third, 0.74; fourth, 0.26, black. Pronotum, length 0.86, width at base 1.16. General color pale to yellowish; scutellum white; hemelytra clear, translucent; tip of cuneus, veins in membrane, narrow inner margin of clavus, narrow band across apex

of corium, and tip of embolium, fuscous to black. Legs and ventral surface pale, apex of hind femora becoming reddish.

FEMALE.—Length 4.00, width 1.55. Head width 0.69, vertex 0.31. First antennal segment, length 0.65, scarcely equal to width of head. Pronotum, length 0.86, width at base 1.20. Very similar to male but black areas much reduced, apex of corium and tip of cuneus still retaining black.

Holotype, male.—URBANA, ILL., Aug. 10, 1932, on bur oak, *Quercus macrocarpa*, H. H. Knight.

Allotype, female.—Same data as for holotype.

Paratypes.—ILLINOIS.—Same data as for holotype, 11 ♂, 22 ♀. STARVED ROCK STATE PARK: July 14, 1932, Dozier & Park, 1 ♂, 5 ♀. URBANA: Aug. 3, 1932, H. H. Ross, 1 ♂; Aug. 10, 1932, H. H. Ross, 5 ♂, 3 ♀; Aug. 11, 1932, H. H. Ross, 1 ♂, 2 ♀, H. H. Knight, 4 ♂, 6 ♀.

IOWA.—AMES: Aug. 1, 1 ♀; Aug. 9, 1932, F. Andre, 2 ♂.

MINNESOTA.—ST. ANTHONY PARK: Aug. 5, 1920, H. H. Knight, 1 ♀.

BRYOCORINAE

KEY TO GENERA

1. Pronotum with a distinct collar and not gibbous posteriorly; sparsely punctured, figs. 73, 99. **Monalocoris**, p. 58
Pronotum without a distinct collar, and posteriorly inflated and enlarged, often very much so; coarsely punctured, figs. 100, 101. 2
2. Pronotum posteriorly greatly inflated, with a longitudinal crease at least in middle; embolium broadly expanded and flat, not thickened, fig. 101. **Pycnoderes**, p. 60
Pronotum posteriorly moderately inflated, without longitudinal impressions; embolium narrow, thickened, fig. 100. **Sixeonotus**, p. 59

Monalocoris Dahlbom

Monalocoris filicis (Linnaeus)

Cimex filicis Linnaeus (1758, p. 443).

ADULT.—Fig. 99. Length 2.50, width 1.40; short oval, convex. General color brown to dark brown, shining. Pronotum

finely punctured; legs and antennae pale yellowish brown.

HOST PLANTS.—Occurs on shield fern (*Aspidium spinulosum*) and cinnamon fern (*Osmunda cinnamomea*).

KNOWN DISTRIBUTION.—A European species known also from Canada, Florida,

1.50. Head width 0.73, vertex 0.43. Rostrum reaching to middle of sternum. First antennal segment, length 0.25; second, 0.54. Pronotum, length 0.86, width at base 1.30. General color black; legs and antennae very light yellowish; membrane black, apical half pale, veins black.

KNOWN DISTRIBUTION.—Texas eastward to Florida, north to Virginia and west to Illinois.

Illinois Records.—ALTON: July 19-21, 1932, Ross & Dozier, 1 ♀. CHAMPAIGN: July 26, 1889, electric light, C. A. Hart,

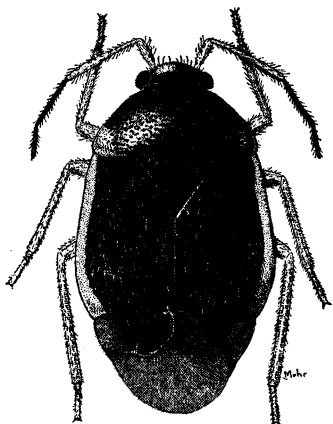


Fig. 99.—*Monalocoris filicis*, ♀.

Illinois, Minnesota, New England states, Wisconsin.

Illinois Records.—ANTIOCH: Aug. 1, 1924, tamarack bog, T. H. Frison, 2 ♀; Aug. 1, 1930, on *Osmunda cinnamomea*, Frison, Knight & Ross, 49 ♂, 50 ♀; July 5-7, 1932, T. H. Frison, 2 ♀. GALENA JUNCTION: July 8, 1917, 1 ♀. VOLO: July 8, 1932, Ross, Dozier & Mohr, 1 ♀; Aug. 24, 1935, DeLong & Ross, 1 ♂.

Sixeonotus Reuter

KEY TO SPECIES

1. Legs black; membrane uniformly fuscous to black.unicolor, p. 59
 Legs entirely pale with brownish areas on hind femora. 2
2. Antennae and legs uniformly pale; membrane with basal half black.
insignis, p. 59
 Antennae black; hind femora and basal halves of tibiae fuscous; membrane pale, veins black.
areolatus, p. 60

Sixeonotus insignis Reuter

Sixeonotus insignis Reuter (1876, p. 78).

ADULT.—Fig. 100. Length 3.10, width

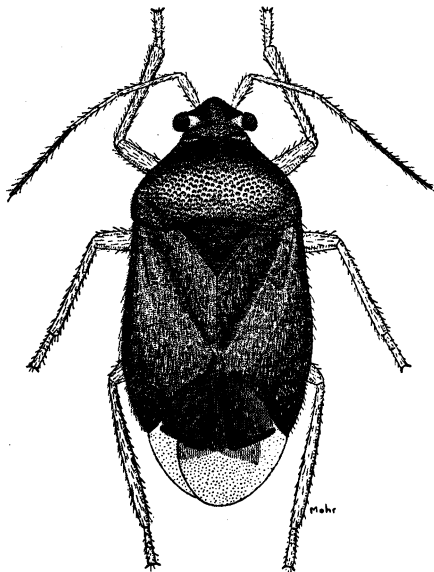


Fig. 100.—*Sixeonotus insignis*, ♀.

1 ♂. DONGOLA: Aug. 22, 1916, at light, 1 ♀. GALESBURG: Stromberg, 1 ♂. HAVANA: Sept. 24, 1895, Matanzas Lake, C. A. Hart, 2 ♂, 1 ♀; July 2, 1934, DeLong & Ross, 1 ♀. METROPOLIS: Aug. 20, 1916, at light, 2 ♀. PULASKI: May 14, 1910, cypress swamp, 1 ♀. WOLF LAKE: July 30, 1934, DeLong & Ross, 1 ♀.

Sixeonotus unicolor Knight

Sixeonotus unicolor Knight (1929a, p. 247).

This species may be distinguished by being uniformly black, including the membrane; the pubescence is prominent, erect and white.

MALE.—Length 3.20, width 1.48. Head width 0.75, vertex 0.47. Rostrum extending slightly beyond middle of sternum, black; length 0.65. Antennae, first segment, length

0.26; second, 0.56; black. Pronotum, length 0.89, width at base 1.30; basal margin very slightly sinuate along middle, obscuring base of scutellum; disk moderately and evenly convex, coarsely and closely punctate, shining. Scutellum coarsely punctate, apical area rather distinctly convex and with finer punctures. Uniformly black, trochanters somewhat pale; membrane uniformly dark fuscous or black; veins black. Clothed with prominent, erect, stiff, white pubescence.

FEMALE.—Length 2.90, width 1.48. Head width 0.73, vertex 0.47. Antennae, first segment, length 0.25; second, 0.53. Pronotum, length 0.90, width at base 1.27. Very similar to male in form, punctuation and pubescence, but generally slightly darker in color.

KNOWN DISTRIBUTION.—Originally described from Mississippi. Now known also from Illinois.

Illinois Records.—GALESBURG: Sept., Stromberg, 1 ♂; Aug. 29, 1888, Stromberg, 1 ♀.

Sixeonotus areolatus Knight

Sixeonotus areolatus Knight (1929a, p. 243).

Not as yet taken in Illinois; known from Alabama, Arkansas, Mississippi, Texas.

Pycnoderes Guerin

KEY TO SPECIES

- 1. Legs black; tibiae paler apically; embolium with large pale spot near base and a slightly smaller one near apex. **convexicollis**, p. 60
- Legs pale; hind femora fuscous on apical half only. 2
- 2. Emboliar margins strongly arcuate; a large pale spot on basal half of embolium, apical half black.
- **drakei**, p. 61
- Emboliar margins very slightly arcuate; embolium with small pale spot near base and also near apex, fig. 101.
- **medius**, p. 60

Pycnoderes convexicollis Blatchley

Pycnoderes convexicollis Blatchley (1926a, p. 166).

This is allied to *medius* Knight, but is larger, with the pronotum more strongly gibbous; the femora are all black except

at the bases, and the tibiae are very dark brown or nearly black, and with the apices almost white.

MALE.—Length 3.40, width 1.50. Head width 0.67, vertex 0.39; front partly yellowish brown. Rostrum just reaching posterior margins of middle coxae. Antennae, first segment, length 0.30; second, 0.65; third, 0.56; fourth, 0.61; pale yellowish, last two segments fuscous. Pronotum, length 1.04, width at base 1.25, height from basal angle 0.65; disk clothed with distinct white hairs, emboliar margins strongly arcuate, edge sharp; basal one-third with large translucent white spot, a small one just before apex; cuneus clear. Membrane lightly infuscated; veins black.

KNOWN DISTRIBUTION.—Described from Indiana. Now known also from Illinois.

Illinois Records.—MARSHALL: Sept. 27, 1934, Frison & Ross, 1 ♂. URBANA: July 4, 1938, 1 ♂; Aug. 15, 1936, Sarah Jones, 1 ♂, KC.

Pycnoderes medius Knight

Pycnoderes medius Knight (1926e, p. 105).

This is allied to *dilatatus* Reuter, but differs in its smaller size, fuscous membrane and broader, more heavily gibbous, bilobed pronotal disk, fig. 101; it differs from *quadrifasciatus* Guerin and *incurvus* (Dis-

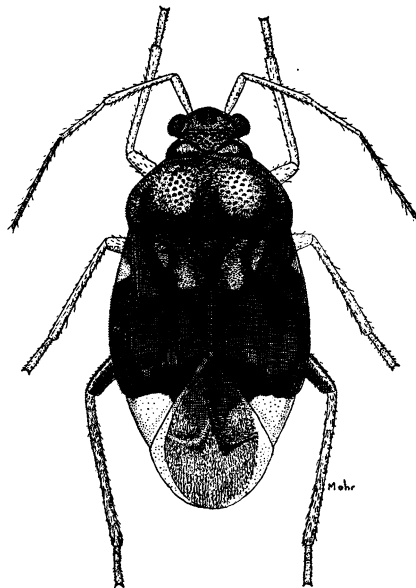


Fig. 101.—*Pycnoderes medius*, ♀.

tant) by the sharp outer edge of its embolium.

MALE.—Length 2.90, width 1.37. Head width 0.63, vertex 0.37. General color black; juga and lora more brownish. Rostrum, reaching hind margin of mesosternum, length 0.67. Antennae, first segment, length 0.27; second, 0.60; third, 0.57; fourth, 0.68; first three segments pale, fourth fuscous. Pronotum, length 0.86, width at base 1.20, height from basal angle 0.53. Punctuation, pubescence and coloration nearly as in *dilatatus*, but hemelytra not so broadly dilated; apical pale spot on embolium sometimes nearly obsolete. Membrane and veins distinctly fuscous, darker at base and on veins, apical margins paler and more brownish. Legs pale; front coxae except apex, and apical half of femora, fuscous to black.

FEMALE.—Fig. 101. Length 2.80, width 1.36; similar to male in form and coloration.

KNOWN DISTRIBUTION.—Described from the Ozarks of Missouri, and now found in southern Illinois.

Illinois Records.—ALTON: July 19-21, 1932, Ross & Dozier, 1 ♂; June 27, 1934, DeLong & Ross, 1 ♂. ELIZABETHTOWN: May 22-24, 1932, Ross, Dozier & Park, 1 ♀.

Pycnoderes drakei Knight

Pycnoderes drakei Knight (1926e, p. 106).

Not yet collected in Illinois; known only from Mississippi.

CYLAPINAE

Represented in Illinois by two tribes, the Cylapini and Fulviini keyed out on pp. 19 and 20.

CYLAPINI

Cylapus Say

Cylapus tenuicornis Say

Cylapus tenuicornis Say (1832, p. 26).

ADULTS.—Length 5.50-6.00, width 2.20. General color brownish gray, marked with white. Distinguished by the long, slender antennae and prominent, protuberant eyes.

HABITS.—This is a very active species, usually to be found on dead and fungus-covered tree trunks.

KNOWN DISTRIBUTION.—Originally described from Indiana, and since recorded

from Illinois, Maryland, New York, Pennsylvania, Ontario, Virginia.

Illinois Records.—MOUNT CARMEL: June 30, 1906, 1 ♂. OREGON: July 9, 1925, T. H. Frison, 1 ♂. SAVANNA: July 29, 1892, base of bluff, 1 ♀.

FULVIINI

KEY TO GENERA

- Tarsi three-segmented; lateral margins of pronotum rounded near anterior angles, not shelflike, fig. 68. **Fulvius**, p. 61
- Tarsi two-segmented; lateral margins of pronotum sharp and shelflike for their entire length, fig. 102. **Peritropis**, p. 62

Fulvius Stål

KEY TO SPECIES

- Second antennal segment uniformly pale yellow; scutellum brown with a pale spot at apex. **brunneus**, p. 61
- Second antennal segment brown, white at apex; scutellum uniformly brown. **imbecilis**, p. 61

Fulvius brunneus (Provancher)

Lygus brunneus Provancher (1872, p. 104).

ADULTS.—Length 3.40, width 1.10. General color brown, marked with yellowish and white. Second antennal segment pale yellowish; femora brown like pronotum, basal half of cuneus white; apex of scutellum and an area on hemelytra pale.

KNOWN DISTRIBUTION.—Originally described from Ontario, and since reported from Colorado, District of Columbia, Illinois, Iowa, Kansas, Massachusetts, Virginia.

Illinois Records.—OLIVE BRANCH: Sept. 29, 1909, W. J. Gerhard, 1 ♀, FM. WEST PULLMAN: July 13, 1902, W. J. Gerhard, 1 ♂; Oct. 27, 1912, A. B. Wolcott, 1 ♀, FM. WILLOW SPRINGS: Aug. 4, 1912, W. J. Gerhard, 1 ♀, FM.

Fulvius imbecilis (Say)

Capsus imbecilis Say (1832, p. 25).

ADULTS.—Length 4.00, width 1.20. Very similar to *brunneus* (Provancher), but larger. Second antennal segment brown with apical third white; femora yellowish brown; scutellum dark brown.

KNOWN DISTRIBUTION.—Described from Indiana and since reported from Alabama, Florida, Illinois, Minnesota, Missouri, North Carolina, Pennsylvania, Tennessee.

ILLINOIS RECORDS.—BEVERLY HILLS: Aug. 27, 1908, W. J. Gerhard, 1 ♂. CARBONDALE: Aug. 21, 1891, Hart & Shiga, 1 nymph. DUBOIS: June 21, 1905, 1 ♀. GALESBURG: Sept., Stromberg, 1 ♂, 1 ♀. HAVANA: Aug. 16, 1883, 1 nymph. MOUNT CARMEL: June 30, 1906, 2 ♂. OLIVE BRANCH: Sept. 29, 1909, W. J. Gerhard, 1 ♀, FM. URBANA: June 16, 1887, electric light, C. A. Hart, 1 ♀. WHITE HEATH: June 25, 1916, 1 ♂.

Peritropis Uhler

KEY TO SPECIES

- Coxae brown; clavus and corium thickly dotted with pale flecks. . . . *husseyi*, p. 62
 Coxae pallid; clavus and corium brown to fuscous, without pallid flecks.
 *saldaeformis*, p. 62

Peritropis saldaeformis Uhler

Peritropis saldaeformis Uhler (1891, p. 122).

Peritropis saldifformis Bergroth (1920, p. 74).

Emended name.

Diagnostic color characters: general color brownish black, alutaceous, head and pronotum thickly dotted with pale yellowish, clavus and corium unspotted, coxae pallid.

FEMALE.—Length 2.90, width 1.51. Head width 0.65, vertex 0.32, length from front margin of eyes to tip of tylus 0.28. Rostrum, length 1.51, reaching to base of sixth ventral segment. Antennae, first segment, length 0.22, brown, a white annulus on basal half, a pallid dot on dorsal aspect of apical half; second, 0.88, dark brown, a white spot at middle on dorsal side, somewhat paler near base. Pronotum, length along median line 0.49, width at base 1.29, anterior width 0.45; lateral margins nearly straight, shelflike, very slightly reflexed; basal margin with small tubercle at median line, each side of this a distinct scallop, then sinuate to basal angle, the basal edge whitish; calli strongly convex, separated at median line by a foveate depression. Scutellum moderately convex, dark brown, apex white; mesoscutum broadly exposed for a longitudinal space equal to three-fourths the length of scutellum. Sternum

and pleura dark brown, a white spot on mesepimeron. Hemelytra dark brown to blackish, a few white dots on costal edge of embolium; width 1.50; emboliar margins very slightly arcuate, moderately reflexed; cuneus triangular, narrow white area at apex and at inner basal angle. Membrane and veins uniformly pale brown. Legs brownish black; coxae pallid to white; tibiae with three white spots on basal half, apical one-third pallid; tarsi pale fuscous. Venter dark brown.

MALE.—Length 3.20, width 1.47; somewhat more slender than the female but very similar in color. Head width 0.60, vertex 0.29. Rostrum, length 1.60, reaching upon seventh abdominal sternite. Antennae, first segment, length 0.19; second, 1.12. Pronotum, length 0.47, width at base 1.21.

KNOWN DISTRIBUTION.—Described from the District of Columbia and Illinois. Uhler states: "Others have been captured near Chicago and in other parts of northern Illinois." Known from District of Columbia, Illinois, Iowa, Maryland, Oklahoma, Pennsylvania and Texas. The only record for Illinois is that in the original description.

Peritropis husseyi Knight

Peritropis husseyi Knight (1923a, p. 50).

FEMALE.—Fig. 102. Length 3.20. Head width 0.62, vertex 0.31, length from front margin of eyes to tip of tylus 0.31; front

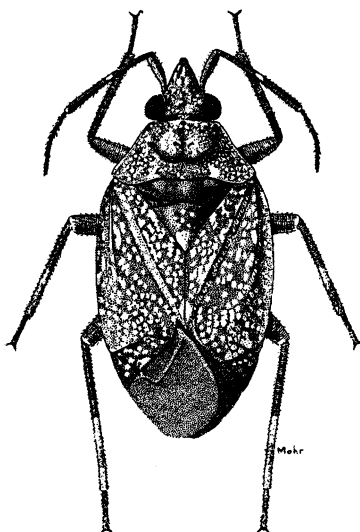


Fig. 102.—*Peritropis husseyi*.

more porrect and more nearly cone shaped than in *saldaeformis* Uhler. General color brownish black, irregularly marked with small pale spots; three or four larger spots on the strongly flattened tylus; bucculae tinged reddish. Rostrum brownish black, length 2.22, nearly attaining the hind margin of the first genital segment. Antennae, first segment, length 0.28, black; second, 1.00, nearly cylindrical, but slightly thickened toward apex, black, a small pallid spot on dorsal side near middle, the extreme tip slightly paler, clothed with very fine, short, pale pubescence; third, 0.29; fourth, 0.34; last two segments slender, black. Pronotum brownish black; length along median line 0.51, width at base 1.17; anterior width 0.61; lateral margins practically straight, shelflike, extreme edge reflexed; anterior angles prominent, forming right angles; basal margin with a broad sulcus which rounds distally; margin without tubercles, practically transverse on the middle one-third; calli less prominent than, and not so abruptly convex as, in *saldaeformis*, separated by a foveate groove at the median line of disk; disk rather closely dotted with whitish spots that are frequently confluent; slender area at lower margin of propleura, and a line extending distad from the top of coxal cleft, pallid. Scutellum nearly as in *saldaeformis*, more extensively white at apex, a few pale dots adjoining; meso-scutum exposed for a longitudinal space equal to two-thirds the length of scutellum, a curved pale mark near each basal angle. Sternum and pleura brownish black; basalar plate, and posterior and ventral margins of epimera, pale; ostiolar peritreme pallid.

Hemelytra brownish black, rather closely spotted with pallid, the spots frequently elongate or confluent, each pale point with a minute, short, scalelike hair; tip of clavus and spot at inner basal angle of cuneus rendered pallid by the fusion of several small points; cuneus black, a few pale points near base; width 1.54, emboliar margins arcuate, somewhat reflexed basally. Membrane uniformly pale fuscous, the veins scarcely darker, slightly paler areas bordering margin of cuneus. Legs brownish black; coxae scarcely paler at apices; middle and hind tibiae paler apically, a narrow pallid annulus near middle; front and middle tarsi pale fuscous, hind pair lighter. Venter brownish black, with pale yellowish pubescence.

MALE.—Length 3.00, width 1.40; slightly

smaller than the female but very similar in structure and color; genital claspers prominent and distinctive.

HABITS.—Collected by R. F. Hussey from beneath bark of white oak logs cut for fence posts.

KNOWN DISTRIBUTION.—Alabama, Illinois and Michigan.

Illinois Record.—MEREDOSIA: Aug. 21, 1917, sand pit, 1 ♀.

CLIVINEMINAE

Represented in Illinois by two tribes, the Largideini and Clivinemini, keyed out on p. 20.

LARGIDEINI

Largidea Van Duzee

Largidea grossa Van Duzee

Largidea grossa Van Duzee (1916c, p. 238).

This species is allied to *davisi* Knight, but is distinguished by the thick, more inflated form of its second antennal segment.

FEMALE.—Length 5.30, width 2.60. Head width 1.34, vertex 0.86. Rostrum extending slightly beyond middle of sternum, length 1.50. Antennae, first segment, length 0.35, thickness 0.17; second segment, 1.73, strongly inflated, thickness 0.30 at middle, tapering off at either end. Pronotum, length 1.60, width at base 2.20, disk moderately convex, with coarse, rugulose punctation. Scutellum moderately convex, finely punctate. Clavus and corium with shallow, rugulose punctation. Clothed with short, recumbent, pale to dusky pubescence. General color reddish brown, calli black, membrane fuscous, veins darker.

KNOWN DISTRIBUTION.—Originally described from Lake Tahoe, California, and later found in Oregon and the Santa Catalina Mountains of Arizona. It occurs on pines.

Illinois Record.—A single female specimen in the Illinois Natural History Survey collection bears the data, "Havana, Ill., Sept. 21, 1895, at lights in town, collected by Hempel." This specimen can be identified only as *Largidea grossa*, although this species has always been considered to be restricted to the far western states. This surprising distribution record cannot at the present time be explained.

CLIVINEMINI

KEY TO GENERA

- Membrane distinctly pubescent; collar not distinctly hooded over head.....
.....**Bothynotus**, p. 64
- Membrane glabrous, or with extremely fine pubescence only; collar hooded or somewhat elevated above head.....
.....**Clivinema**, p. 64

Clivinema Reuter

No Illinois species; *Clivinema villosa* Reuter occurs in Montana, Oklahoma, Texas.

Bothynotus Fieber

Bothynotus modestus (Wirtner)

Neobothynotus modestus Wirtner (1917, p. 34).

This species is distinguished from the other known American species by its large size and longer antennae; also, the length

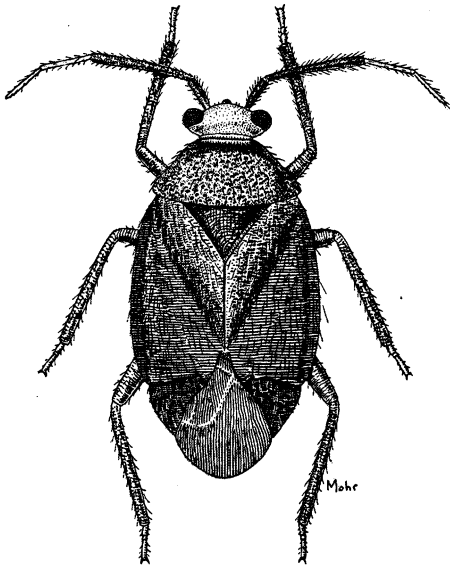


Fig. 103.—*Bothynotus modestus*, ♂.

of the second antennal segment is much greater than the width of the head.

MALE.—Fig. 103. Length 5.10, width 2.40. Head width 0.99, vertex 0.56. Rostrum reaching to bases of hind coxae, length 1.60. Antennae, first segment, length 0.49,

fuscous-brownish, strongly pubescent; second segment, 1.50, black, cylindrical, equal in thickness to first segment, thickly clothed with suberect pubescence; third, 0.69, slender, pale to dusky, clothed with long pubescence; fourth, 0.35, slender, fuscous. Pronotum, length 1.30, width at base 1.90; disk convex, coarsely and closely punctate, clothed with long fuscous pubescence. Scutellum strongly convex, impunctate, pubescent. Hemelytra with emboliar margins subparallel, with sharp edge, clavus and corium strongly, transversely rugulose; membrane and veins uniformly dark fuscous, thickly clothed with erect fuscous pubescence. Body black, distinctly shining, head red, tylus black, legs very dark brown, tibiae somewhat paler and translucent.

FEMALE.—Length 4.80, width 2.60; emboliar margins distinctly arcuate. Head width 1.01, vertex 0.65. Antennae, first segment, length 0.51; second, 1.20, more slender than first segment, black, paler on basal half, clothed with long pubescence; third, 0.73; fourth, 0.56. More robust than male, but similar in color and pubescence.

KNOWN DISTRIBUTION.—Described from Pennsylvania, where it was found on pine trees. Single specimens are now known from Illinois, Kansas, Maryland, Ohio. Apparently this is a rare but widely distributed species.

Illinois Record.—**NORTHERN ILLINOIS:** 1 ♀.

DERAEOCORINAE

KEY TO GENERA

1. Second antennal segment broad and distinctly flattened, fig. 20.....
.....**Hesperophylum**, p. 74
- Second antennal segment cylindrical, fig. 105..... 2
2. Antennae linear, very long and of nearly equal thickness throughout, fig. 105; vertex transversely striate and longitudinally sulcate, fig. 104; second segment of hind tarsus much shorter than either first or third segments; usually large, elongate species
.....**Eustictus**, p. 65
- Antennae not so long or linear, second segment slender at base and slightly enlarged toward apex, third segment slender, fig. 107; vertex usually polished; second segment of hind tarsus

as long as either first or third segments, or nearly so..... 3

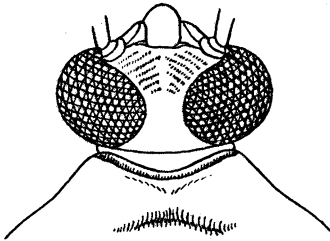


Fig. 104.—Head and pronotum of *Eustictus salicicola*.

3. Head strongly produced and nearly horizontal, facial angle acute, tylus projecting beyond apex of first antennal segment, fig. 108; emboliar margin thin and broadly expanded, sides nearly parallel.....

..... *Eurychlopterella*, p. 73

Head less produced, scarcely surpassing middle of first antennal segment, fig. 107, facial angle either one of 90 degrees or only slightly less; embolium not as above.....

..... *Deraeocoris*, p. 66

Eustictus Reuter

KEY TO SPECIES

1. Hind tibiae with long, fine hairs on basal half, these hairs distinctly longer than true spines..... 2

Hind tibiae with minute pubescence on basal half, these hairs not so long as true spines..... 3

2. Pronotal disk uniformly very dark brown; legs chiefly reddish, tibiae without paler bands; length 8.00–11.00..... *filicornis*, p. 66

Pronotal disk black, but paler near basal margin; legs pale testaceous and marked with black, tibiae distinctly marked with four alternating pale and fuscous bands.....

..... *venatorius*, p. 66

3. Pronotal disk with median portion black; broad, pale areas with dark punctures present at lateral margins; width of vertex of male only slightly greater than thickness of first antennal segment; length, male 6.90, female 7.40..... *salicicola*, p. 65

Pronotal disk chiefly dark brown, not

paler at lateral margins; width of vertex of male twice as great as thickness of first antennal segment; length, male 5.50–6.00, female 7.00..... *necopinus*, p. 66

Eustictus salicicola Knight

Eustictus salicicola Knight (1923d, p. 482).

This is allied to *venatorius* Van Duzee, but differs in the form of its antennae, its tibial pubescence and the color pattern of the dorsum.

MALE.—Fig. 105. Length 6.90, width 2.40. Head width 1.19, vertex 0.08, height of eye 0.77; eyes prominent, projecting above

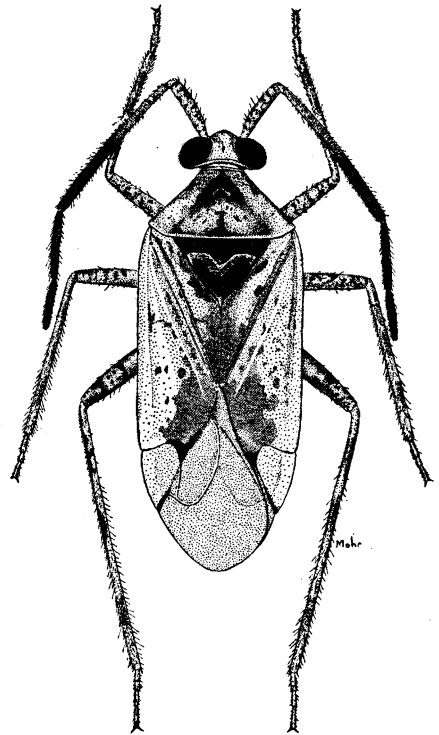


Fig. 105.—*Eustictus salicicola*, ♂.

vertex and below gula. Rostrum, length 2.77, attaining posterior margins of hind coxae. Antennae, first segment, length 0.81, pale, marked with black; second, 2.31, dark fuscous, paler on basal one-sixth but with faint dark spots, extreme apex paler, rather densely covered with fine, short, pale pubescence, a few hairs slightly longer, but none exceeding thickness of segment; third, 1.05, black, paler apically; fourth, 0.91, black. Pronotum, length 1.25, width at base 2.00;

median portion of disk black, broad pale areas with dark punctures present at lateral margins; propleura very dark brown, lower margins pale. Scutellum black, basal angles paler; minutely, sparsely pubescent. Hemelytra glabrous, pale, translucent and marked with fuscous, but without large spots on basal half as in *venatorius*; clavus black on either side of commissure, slender dark markings bordering claval veins; corium with punctures; radius, and large spot on inner apical angle, dark fuscous to black; embolium scarcely darkened at apex, extreme outer edge black, width 2.50. Cuneus pale, translucent, inner apical margin blackish. Membrane pale, smoky within areoles, veins slightly darker, a fuscous mark bordering apical margin of larger areole. Legs pale and marked with black; femora with apical half marked and spotted with black, an irregular pale but spotted subapical annulus; tibiae with four paler bands but more or less interrupted with dark spots, pubescence short, not attaining length of true spines. Venter pale greenish with reddish marks.

FEMALE.—Length 7.40, width 2.77; very similar to male in coloration, but differs in pilose character of antennae.

HABITS.—This species occurs on the bark of willow trees where it may be predacious on aphids and other small insects.

KNOWN DISTRIBUTION.—Illinois, Iowa, Kansas, Minnesota, Mississippi, Nebraska, Oklahoma, South Dakota, Texas.

Illinois Records.—Five males and 8 females, taken June 17 to Sept. 7, are from Alton, Chicago, Galesburg, Havana, Lawrenceville, Metropolis, Mount Carmel, Rosiclare, Savanna.

Eustictus filicornis (Walker)

Capsus filicornis Walker (1873, p. 96).

Megacoelum grossum Uhler (1887c, p. 70).

Not taken in Illinois; known from District of Columbia, Florida, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, Virginia; occurs on yellow pine (*Pinus echinata*).

Eustictus venatorius Van Duzee

Eustictus venatorius Van Duzee (1912, p. 479).

Not taken in Illinois; known from New York, where it occurs on hickory trees.

Eustictus necopinus Knight

Eustictus necopinus Knight (1923d, p. 481).

Not taken in Illinois; known from British Columbia, District of Columbia, Massachusetts, New York, Ontario; occurs on aspen.

Deraeocoris Fieber

KEY TO GROUPS AND SUBGENERA

1. Claws not cleft or only slightly cleft, fig. 34..... **Group C**, p. 72
Claws deeply cleft near base, figs. 33, 35..... 2
2. Scutellum punctate..... **Group A**, Subgenus **Camptobrochis**, p. 66
Scutellum impunctate..... 3
3. Dorsum practically glabrous, at most only sparsely and finely pubescent (*not rubbed specimens*), rarely with a few hairs at anterior angle of pronotum; hind tibiae with a row of spines or heavily chitinized hairs on anterior face..... **Group B**, p. 69
Dorsum heavily pubescent or hairy, at least with long hairs at anterior angles of pronotum; hind tibiae without distinct spines on anterior face, usually closely set with prominent long hairs..... **Group D**, Subgenus **Euarmosus**, p. 73

Group A

KEY TO SPECIES

1. Dorsum bright red; clavus, a pair of large spots on corium and pronotum black..... **histrion**, p. 69
Dorsum not red and black as above... 2
2. Cuneus red or stained with reddish; membrane hyaline or with only a fuscous spot at apex, or a point either side of middle..... 3
Cuneus infuscated or marked with black, rarely reddish; if reddish, membrane distinctly black; membrane usually heavily marked with fuscous; if not, cuneus without a trace of reddish..... 4
3. Length of second antennal segment not equal to length of pronotum; two fuscous spots on apical half of membrane, darkest specimens developing

- a brownish cloud distad of spots.
 **ornatus**, p. 67
 Length of second antennal segment at
 least equal to length of pronotum;
 membrane infuscated at apex.
 **poecilus**, p. 67
 4. Membrane nearly clear, but having two
 small fuscous points, one at either
 side on apical half. . . **nebulosus**, p. 67
 Membrane with apical half heavily
 infuscated. **nubilus**, p. 69

Deraeocoris nebulosus (Uhler)

Camptobrochis nebulosus Uhler (1872, p. 417).

ADULT.—Length 3.50–3.90, width 1.75–2.00; ovate, shining; olivaceo-testaceous, darkened with black, or fuscous to black with pale markings; membrane clear, a pair of small fuscous points on apical half, one on either side of middle. Male genitalia as in fig. 106.

HABITS.—Predacious; occurs most frequently on bur oak (*Quercus macrocarpa*) and maple (*Acer* sp.), but also on other trees.

KNOWN DISTRIBUTION.—Common in the eastern states and westward to Texas and Colorado.

Illinois Records.—One hundred fifty males and 175 females, taken May 11 to Nov. 1, are from Algonquin, Allerton, Alton, Antioch, Cary, Centralia, Champaign, Chicago, Cobden, Danville, De Soto, Dolson, Dubois, Eichorn, Elizabeth, Ernst, Fairmount, Frankfort, Galena, Galesburg, Giant City, Grafton, Grand Tower, Harrisburg, Havana, Kansas, Lawrenceville, Meredosia, Metropolis, Milford, Monticello, Muncie, Normal, Oquawka, Palos Park, Paris, Quincy, Rockford, Rockton, Springfield, Starved Rock State Park, Urbana, Warsaw, White Heath, White Pines Forest State Park, Willow Springs, Zion.

Deraeocoris ornatus Knight

Deraeocoris (*Camptobrochis*) *ornatus* Knight (1921, p. 99).

This species is very similar to *poecilus* (McAtee), but the second antennal segment is shorter in proportion to the length of the pronotum and the punctures on the disk are finer; the two rounded fuscous spots on the apical half of the membrane are suggestive of *nebulosus* (Uhler), but

the darkest specimens of *ornatus* may develop a brownish cloud distad of the spots.

MALE.—Length 4.50, width 2.08. Head width 1.01, vertex 0.40. Antennae, first segment, length 0.34; second, 1.11, scarcely equal to length of pronotum, thickness 0.08, black, brown annulus indicated at middle; third, 0.40; fourth, 0.40. Pronotum, length 1.14, width at base 1.92; calli black, a reddish brown stripe extends around posterior margin and more or less toward anterior angles of disk; grayish testaceous, paler near margins of disk and at median line, not so distinctly brownish as in *poecilus*. Scutellum reddish brown to piceous, punctures black, apex and lateral margins ivory white, median line usually indicated. Hemelytra grayish, translucent; punctures, frenal margin, areas bordering commissure, spot at middle, and stripe along apical margin of corium, piceous; tip of embolium translucent, reddish. Cuneus red, translucent, paler at inner angle and outer margin; several very fine, black punctures evident. Membrane pale, brachium infuscated, more or less invading membrane on both sides; a pair of rounded fuscous spots present on apical half, one either side of middle, darkest specimens developing a brownish cloud distad of spots. Genitalia as in fig. 106.

FEMALE.—Length 4.80, width 2.34; very similar to male. Second antennal segment, length 1.08; slightly shorter than length of pronotum, which is 1.20, black, middle one-third testaceous or brownish; all other segments black.

KNOWN DISTRIBUTION.—Illinois, Iowa, Missouri, Nebraska, South Dakota.

Illinois Records.—DIXON SPRINGS: May 9, 1935, C. O. Mohr, 4 ♀. EICHORN: May 11, 1933, C. O. Mohr, 1 ♀. GOLCONDA: May 10, 1935, C. O. Mohr, 1 ♀. PIKE: June 28, 1934, DeLong & Ross, 2 ♀. VIENNA: June 14, 1934, DeLong & Ross, 1 ♀. One female labeled "Ill." in the C. V. Riley collection, USNM.

Deraeocoris poecilus (McAtee)

Camptobrochis poecilus McAtee (1919, p. 246).

Deraeocoris cuneatus Knight (1921, p. 96).

ADULTS.—Length 4.00–5.00, width 2.00–2.50; slightly larger than, but structurally very close to, *nebulosus* (Uhler); olivaceo-testaceous to brownish and black, cuneus red, membrane clear, a rather distinct, some-

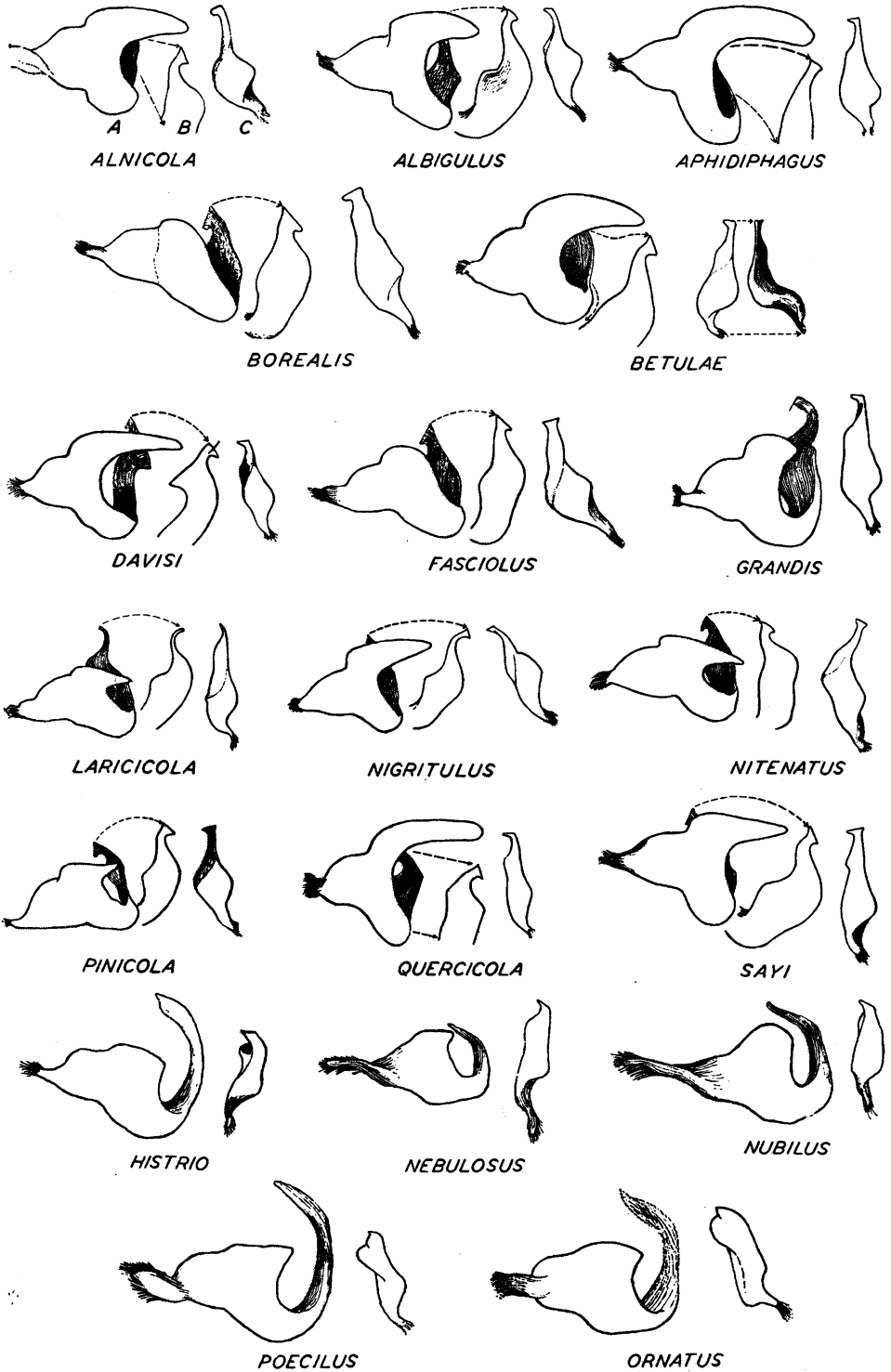


Fig. 106.—Male genital claspers of *Deraeocoris*. A, B, left clasper; C, right clasper.

what oval-shaped, fuscous spot at apex. Male genitalia as in fig. 106.

HABITS.—Predacious; occurs most frequently on alder (*Alnus rugosa*) and red birch (*Betula nigra*).

KNOWN DISTRIBUTION.—Illinois, Minnesota, New York, Pennsylvania, West Virginia.

Illinois Records.—Thirty males and 25 females, taken May 1 to July 26, are from Antioch, Carmi, Charleston, Eichorn, Elizabethtown, Galena, Grafton, Grand Tower, Harrisburg, Havana, Herod, Lawrenceville, Metropolis, Pike, Quincy, Rock Island, Starved Rock State Park, West Union.

Deraeocoris histrio (Reuter)

Callicapsus histrio Reuter (1876, p. 75).

ADULTS.—Length 4.50–5.00, width 2.00–2.30; dorsum bright red; clavus, a pair of large spots on corium and pronotum black. Male genitalia as in fig. 106.

HABITS.—Found breeding on smartweed (*Polygonum mühlenbergii*) in Minnesota and Colorado, where it appeared to be predacious in part on certain Fulgoridae.

Illinois Records.—Sixty-two males and 51 females, taken May 4 to Nov. 10, are from Algonquin, Argo, Bath, Canton, Champaign, Chicago, Galesburg, Grand Tower, Havana, Homer Park, Kampsville, Metropolis, Normal, Palos Park, Putnam, Quincy, Savanna, Savoy, Starved Rock State Park, Urbana.

Deraeocoris nubilus Knight

Deraeocoris (Camptobrochis) nubilus Knight (1921, p. 106).

ADULTS.—Length 4.20–4.80, width 2.00–2.30; male more elongate than female, apical half of membrane usually heavily infuscated; disk of pronotum fuscous to black behind calli, median line pale; femora biannulate with apical half pale. Male genitalia as in fig. 106.

HABITS.—Occurs on pine (*Pinus strobus*); probably predacious.

KNOWN DISTRIBUTION.—Illinois, Minnesota, Nebraska, New England states, New York, North Carolina, Virginia.

Illinois Records.—STARVED ROCK STATE PARK: July 14, 1932, on *Pinus strobus*, Dozier & Park, 1 ♂; Sept. 17, 1935, DeLong & Ross, 1 ♀. WHITE PINES FOREST STATE PARK: July 4, 1932, on *Pinus*

strobus, Dozier & Mohr, 66 ♂, 57 ♀; July 12, 1934, DeLong & Ross, 2 ♀.

Group B

KEY TO SPECIES

1. Tibiae with fuscous or pale bands 2
Tibiae uniformly pale or yellowish 7
2. Membrane with a distinctly rounded fuscous spot on apical half, frequently connected at base by a fuscous streak extending down from between areoles, thus leaving a large pale spot on either side of middle and on area bordering apex of cuneus 3
Membrane usually somewhat infuscated, but not as above 4
3. Calli solid black, a broad piceous ray behind each; in pale specimens, calli may be somewhat brownish, but, in such cases, median line and margins of disk distinctly pale, leaving a dark brown ray behind each callus; hemelytra with clavus and corium piceous, embolium pale **borealis**, p. 71
Calli more or less invaded with brownish, or pale, distinct rays not apparent behind calli; hemelytra and pronotum more uniformly colored, either dull yellowish brown or dark brown **fasciolus** var. **fasciolus** p. 70
4. Rostrum extending slightly beyond posterior margins of hind coxae; membrane with apical half scarcely infuscated; femora pale but with two distinct black bands near apex; hind tibiae with two fuscous annuli on basal half **grandis**, p. 71
Rostrum scarcely attaining posterior margins of hind coxae; membrane, femora and hind tibiae not having above combination of characters 5
5. Femora uniformly dark on apical half, likewise basal part in darkest specimens; venter distinctly reddish, sometimes dark chestnut red, shining **betulae**, p. 70
Femora with apical half distinctly banded or entirely pale 6
6. Second antennal segment provided with prominent, pale, erect hairs, their length equal to three times thickness of segment; pronotum

- with discoidal margins pale, calli and posterior part of disk black, forming a ray behind each callus, thus leaving median line pale.
 **alnicola**, p. 70
- Second antennal segment without prominent, exerted hairs or, if such hairs present, their length never more than twice thickness of segment; pronotal disk without distinct rays, sometimes black, but lateral margins not distinctly paler.
 **aphidiphagus**, p. 71
7. Hind femora with two brown or fuscous bands near apex; apical half of membrane with a distinctly rounded fuscous spot, usually connected at base by a fuscous streak that extends up between large areoles. 8
 Hind femora with but one fuscous band; apical half of membrane pale or clouded with fuscous, but fuscous area not forming a rounded spot on apical half. 9
8. Calli solid black, a broad piceous ray behind each; in pale specimens, calli may be somewhat brownish, but, in such case, median line and margins of disk distinctly pale, leaving a dark brown ray behind each callus; hemelytra with clavus and corium piceous, embolium pale.
 **borealis**, p. 71
- Calli more or less invaded with brownish or pale areas, distinct rays not apparent behind calli; hemelytra and pronotum more uniformly colored, fulvo-testaceous to dark brownish.
 **fasciolus** var. **castus**, p. 70
9. Dorsum uniformly very dark brown; calli and scutellum black.
 **davisi**, p. 72
- Dorsum pale to testaceous and brownish, frequently becoming fuscous or black but always with some pale areas; calli margined with black or entirely black. 10
10. Calli black only around margins, dorsum rich brownish to deep brown, shining. **nitenatus**, p. 72
- Calli entirely black, or, if not, dorsum pallid and with three darkened spots on each hemelytron, one at apex, one at middle and one at base. 11
11. Dorsum fuscous to black, usually with

a pale median line running over disk and scutellum; hemelytra darkened to such an extent that three blotch-like, fuscous spots are not apparent . . . **quercicola** var. **quercicola**, p. 71

Dorsum pallid brown with three dark spots, one at base, one at middle and one at apex of each hemelytron; calli usually entirely black, but, in pale specimens, calli only margined with black.
 **quercicola** var. **pallens**, p. 71

Deraeocoris betulae Knight

Deraeocoris betulae Knight (1921, p. 129).

No Illinois specimens; known from the New England and Middle Atlantic states; occurs on birch (*Betula lutea*). Male genitalia as in fig. 106.

Deraeocoris alnicola Knight

Deraeocoris alnicola Knight (1921, p. 132).

No Illinois specimens; known from Connecticut, Ontario, New York; occurs on alder (*Alnus incana*). Male genitalia as in fig. 106.

Deraeocoris fasciolus Knight

Deraeocoris fasciolus Knight (1921, p. 123).

ADULTS.—Length 6.50, width 2.80–3.10; usually slightly smaller than *borealis* (Van Duzee), disk of pronotum more uniformly colored, calli more or less invaded with brownish or pale and without distinct rays behind; left genital clasper very similar to that of *borealis*, but right clasper distinctive, fig. 106.

In the variety *fasciolus castus* Knight (1921, p. 125) the tibiae are uniformly yellowish rather than partly dark, as in the typical form; *castus* has not been taken in Illinois.

HABITS.—Occurs on hawthorns (*Crataegus* sp.) and apple trees, where it feeds on the rosy aphid, *Macrosiphum rosae* (Linnaeus). In New York the author found the white, wax-coated nymphs of *D. fasciolus* frequenting the aphid-curved leaves, feeding on aphids and their honeydew excretions.

ILLINOIS RECORDS.—NORTHERN ILLINOIS: July, 1 ♂, 1 ♀. ANTIUCH: Aug. 1, 1930, Frison, Knight & Ross, 1 ♀. GALENA: June 30, 1932, Dozier & Mohr, 1 ♀. MONTICELLO: June 11, 1934, Frison & De-