

species have become adapted to bog- or swamp-plants where they are subject to very humid conditions or at times must be able to undergo temporary immersion.

Acknowledgements: The authors wish to express here, briefly, their sincere appreciation to those who have kindly assisted in these studies. We are indebted to Dean F. F. Moon, New York State College of Forestry, for the opportunity of carrying on these investigations. The drawings have been made by Mr. J. R. Sim of Ashtabula, Ohio. Mr. A. E. Fivaz has taken many of the photographs and assisted in the field work. Director W. E. Sanderson of the State Forest Camp has very kindly permitted us to use boats, canoes, tents and other equipment of the Summer Camp. The plants have been determined by Dr. W. L. Bray, Syracuse University, and Dr. H. P. Brown, New York State College of Forestry. The map of Cranberry Lake region has been drawn from a map of the Adirondacks by the Conservation Commission of New York State by Mr. Paul W. Stickel under the direction of Professor H. C. Belyea. Dr. M. W. Barrows of Ohio State University identified the spiders. For the determinations of insects thanks are due as follows: Dr. H. H. Knight of the University of Minnesota, the *Miridae*; Dr. H. B. Hungerford of the University of Kansas, the *Corixidae*; Dr. H. M. Parshley of Smith College, the *Aradidae*; Mr. H. G. Barber of Roselle Park, N. J., the *Lygaeidae*; and Mr. J. R. de la Torre Bueno of White Plains, N. Y., many of the *Saldidae*.

HOMOPTERA IN THE VICINITY OF CRANBERRY LAKE

BY HERBERT OSBORN

Family *CICADIDAE*

This family is not represented in the Cranberry Lake region by any number of species, the only one which has been definitely recognized being *Tibicen canicularis*. The group is interesting on account of the extended life history of the 17 year *Cicada* and the root-feeding habits of the immature forms. They are of economic importance because of the punctures caused by the females in depositing eggs which are laid in the twigs or smaller branches of various forest trees. It would seem almost certain that *Tibicen rimosa* should be found in this region but no specimens have been observed. Also the species described as *T. noveboracensis* by Fitch would seem likely to occur as it was discovered from the eastern part of the state.

Tibicen canicularis (Harris).

This, as stated above, is the only species definitely recognized. It was singing during August of the present year, but no specimens were captured.

Family *CERCOPIDAE*

The spittle insects or frog hoppers are quite noticeable on account of the masses of froth that surround the young and which adheres to stems of plants or twigs of trees in such quantity as to attract attention. Some of the species must be of considerable economic importance since they occur in such numbers as to cause a severe drain upon the plants affected. The most notable ones in this area are the meadow frog hopper and the forest frog hopper mentioned below.

Aphrophora parallela (Say) (Fig. 12, a).

Cranberry Lake (Barber Pt.), July 8, 1917; Aug. 1-8, 1917; Aug. 4, 1918.

Wanakena, Aug. 1-7, 1917. The species is apparently limited to coniferous trees as it has apparently never been recorded outside of the coniferous area and is the most common species on the conifers; its nymphal stages and the associated froth masses appear during June and early July. The adults are not uncommon in July and egg-deposition occurs during July or August.

This species is capable of considerable injury to the coniferous forests being very generally distributed and abundant and the punctures on the twigs resulting in weakening, wilting, or occasionally killing of terminal twigs; the evidence of injury, unless the froth masses are observed, are apparent only some time after the attack has been made. It may commonly be credited to other sources of injury as the real culprits may have entirely disappeared when the injury becomes evident. Adults probably feed to quite an extent on the twigs or smaller branches but with less drain upon the plant than during the nymphal stage. It has been bred from spruce and pine and may occur on other conifers.

Aphrophora 4-notata (Say).

This occurs on quite a large variety of plants and in some locations is very common. It is apparently most frequent in the low ground locations along streams or lake margins, although one captured on the plains, which was in a border of a thicket, might indicate more open habitat. Cranberry Lake, July 11-14-20, 1917, July 28-30. Aug. 11, 1920. Wanakena, Aug. 1-7, 1917. This species also occurs on a variety of plants and has been taken in a number of different plants, especially in the vicinity of Barber Point.

Philaronia bilineata (Say).

This species is common on the western plains and during the present season was found only on the "plains" where it occurred in open meadows upon the plains grass. In such location it is quite abundant, but can hardly be counted an economic species in this region. Cranberry Lake, July 24, 1917. Wanakena, Aug. 1-7, 1917. Plains, Aug. 3, 1920.

Philaenus leucophthalmus (Linnaeus) (Fig. 13).

The meadow frog-hopper is one of the most abundant of the spittle-insects and throughout the entire New England region occasions no little injury to plants, especially clover and other legumes, but does not attack the grasses. It has no restricted habitat except that it does not occur in the deeper woods and its froth masses are most commonly observed on the small shrubs or annuals. The froth masses of this species are not distinguishable from those of *P. lineatus*, but there seems to be a distinct choice of food plant; it occurs on a great variety of plants but, so far as observed, not on grasses. The occurrences of special interest

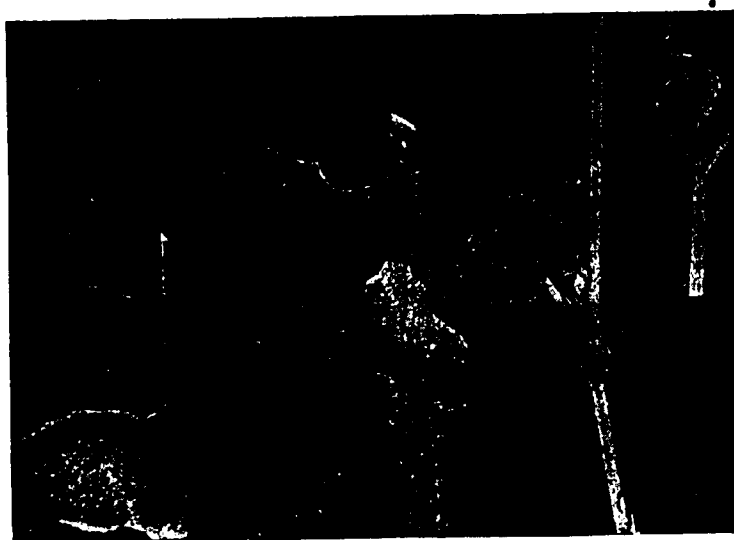


Fig. 13.— Froth masses of *Philaenus leucophthalmus* Linn. Photo by Fivaz.

here are on fire cherry, and raspberry, but they abound on many plants, especially those of the family *compositae*.

The larvae of this species are to be separated from those of *P. lineatus* by the relatively shorter, blunter head. The froth masses including nymphs appear for this locality at the same time as those of *P. lineatus*, late June and early July, the adults beginning to appear by July 10 (1920) and becoming abundant a little later.. The species occurs in many different varieties both in Europe and America and most of these varieties have been observed in the Cranberry Lake region. Cranberry Lake, July 21, 1917, Aug. and July 2, 1920; Camp, early July, 1920; Wanakena, Aug. 1-7, 1917; Grasse River, July 22, 1920; Plains, Aug. 3, 1920.

Philaenus lineatus (Linnaeus).

The grass frog-hopper is very similar to the preceding but seems to restrict itself to grasses and consequently it is only found in open land, possibly more frequently in the more moist habitats. Observations in Maine showed this species to be closely restricted to various species of grasses and while we have not bred out adults for this region the immature forms examined bear out the conclusion that the species is essentially a grass-feeder here. The froth masses have been very plentiful on timothy (introduced) on the camp grounds and on native grasses of the vicinity. Its distribution is apparently determined by that of host plants, but wherever such plants are available along trails of "tote roads" they may be found penetrating well into the woodlands and on hill sides or ridges of all parts of the region. Wherever grasses are of value the species may be counted of distinct economic importance. Cranberry Lake, July 18, 1917; Aug. 1-7, 1917; July 3-5, 1920; Wanakena, Aug. 1-7, 1917, and July 29, 1920; Grasse River, July 22, 1920; Plains, Aug. 3, 1920.

Clastoptera obtusa Say (Fig. 12, b and c).

This is a very common species on birch, alder and other trees and shrubs and may be considered of distinct economic importance in the forest as on some occasions a large number will be found on a single branch and the sap drawn from the plant for the formation of the froth masses must mean a very considerable loss to the plant. While apparently protected very well by the froth mass, in one instance a species of mirid, *Deraeocoris (Campobrochys) borealis*, was found with its beak inserted in the nymph within the froth mass. This species has been particularly conspicuous during the season, its froth masses occurring in abundance on several trees and shrubs, but in especial abundance on the yellow birch, often several froth masses with at least one nymph in each mass hanging from a single twig. The froth masses on birch frequently show a large quantity of liquid with very few bubbles so that they appear watery or quite transparent and the nymph is very easily seen within the mass of fluid. Midges have been found adhering to the fluid mass, their legs entangled in the glairy substance much as a fly is entrapped in tanglefoot. Froth masses on birch, noted about July 10 and enclosed in twig cage, produced adult the 23d of July, 1920.

Yellow birch is apparently the most infested of any of the trees of the vicinity. The general distribution is emphasized by their occurrence on birch in dense forest and it is quite probable they may be occasionally abundant in the tree tops that are out of reach of observation and constitute a distinct drain on the growth of the trees. Cranberry Lake, July 30-31, 1917; July 2-31, 1920. Wanakena, Aug. 1-7, 1917. Plains, Aug. 3, 1920.

Clastoptera proteus Fitch.

Also a very common species but apparently restricted more to the lower or very moist locations and occurring on heath plants, especially blue berries and cranberries. Cranberry Lake, July 28, 1917; Aug. 1, 1917; (Nymphs) July 3-6, 1920; (Adult) Aug. 10-11, 1920. Wanakena, Aug. 1-7, 1917.

Family MEMBRACIDAE**Ceresa diceros** (Say).

This species, which is abundant in some locations, has not been observed commonly and probably is restricted to some food plant which is not abundant here. Cranberry Lake, Aug. 1 and Sept. 15, 1917. Wanakena, Aug. 1-7, 1917.

Ceresa bubalus (Fabricius).

The Buffalo tree-hopper, which is such a very abundant species throughout the country, occurs here only sparingly and is evidently not a forest species but adapted to open areas or particularly to annuals or shrubs. Where abundant, the eggs being deposited in branches or twigs of trees have occasioned very considerable injury, but owing to its scarcity it might be considered of no economic importance for this region and probably for the Adirondacks generally. Cranberry Lake and Barber Point, Aug. 9, 1920. Wanakena (Ranger School), Aug. 12, 1920.

Ceresa basalis Walker (Fig. 14, *a* and *b*).

This is the most common species of the genus for the Adirondack region and is found in low ground on the grasses and annual plants. It is sufficiently abundant to be counted distinctly injurious for the plants on which it occurs. The species is northern in its distribution and, except for high land, shades out into about the latitude of the Adirondacks. Cranberry Lake, July 28, Aug. 1, 1917; Sept. 15, 1917; July 30, 1920; Aug. 10, 1920. Wanakena, Aug. 1-7, 1917. Plains, Aug. 3, 1920.

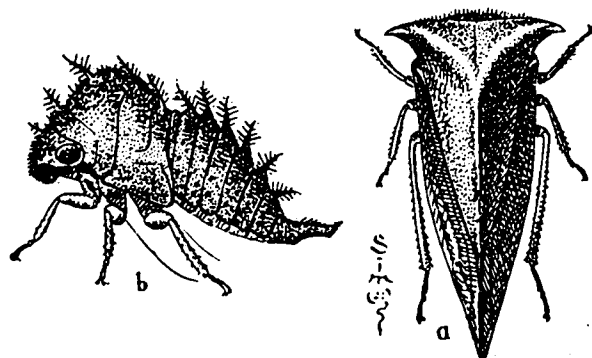


Fig. 14.—*Ceresa basalis* Walk: *a*, adult; *b*, nymph.

Carynota stupida (Walker) (Plate III).

This is the most abundant species observed affecting the forest trees in the region and more detail is given in the section devoted to its life history. Cranberry Lake, July 28, 1918; nymphs abundant on birch, July 2-15, still present July 29, 1920; adults, July 13, Aug. 11, 1920. Wanakena, Aug. 1-7, 1917.

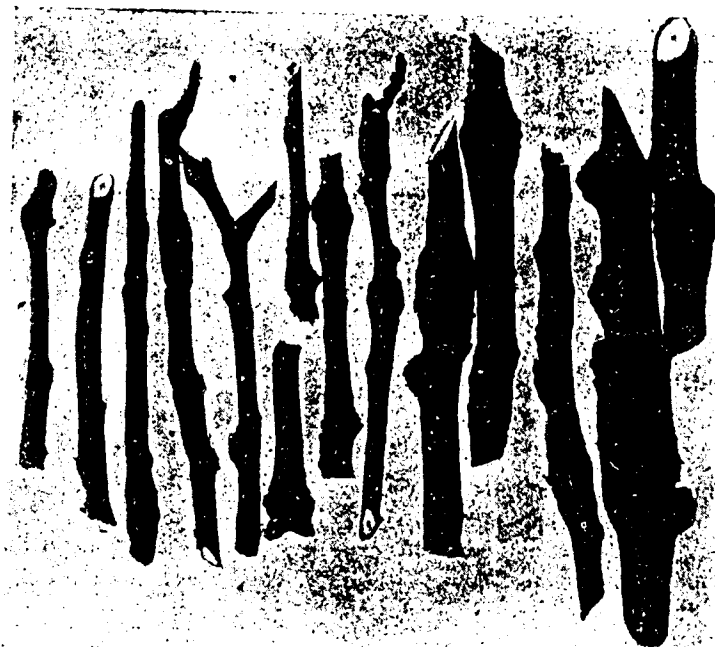


Fig. 15.—Scars from egg deposition of *Telamona* on aspen. About natural size. Photo by Fivaz.

Carynota marmorata (Say).

Cranberry Lake, July 26, 1917.

Telamona declivata Van Duzee (Figs. 15 and 16).

This species has been noted as quite common on willows and might be considered an economic species if the willows were of greater commercial value. Cranberry Lake, July 11; Aug. 4, 1917.

Telamona barbata Van Duzee (Fig. 17, *a*, *b* and *c*).

The specimens referred to here agree closely with description by Van Duzee, except that the marking are more profuse.

Telamona reclivata Fitch.

Wanakena, Aug. 1-7, 1917. A single nymph which may very probably belong to this species was taken from poplar.

Telamona coryli Fitch.

Wanakena, July 15 and Aug. 12, 1920; beaten from *Corylus*.

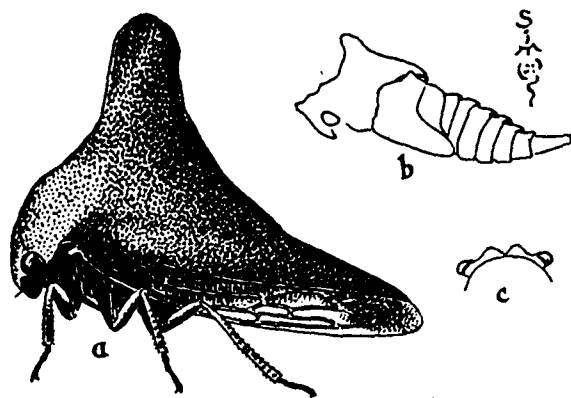


Fig. 16.—*Telamona declivata* Fitch: a, adult (side view); b, Outline of nymphal skin; c, Outline of head from above.

Publilia concava (Say).

A common, often abundant species of wide range but not taken here except at the Plains, Aug. 3, 1920.

Campylenchia latipes (Say).

Cranberry Lake, Sept. 15, 1917, July and Aug., 1920. Plains, Aug. 3, 1920. Very common, especially where leguminous plants furnish appropriate food.

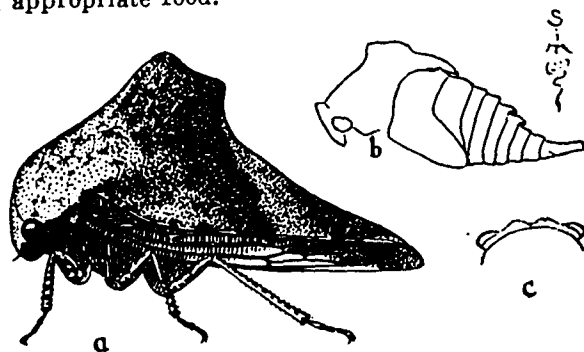


Fig. 17.—*Telamona barbata* Van D.: a, adult (side view); b, Outline of nymph; c, side view; d, outline of head from above.

Enchenopa binotata (Say).

Plains, Aug. 3, 1920.

Microcentrus caryae (Fitch).

Cranberry Lake, July 11, 1917.

Family **CICADELLIDAE****Agallia novella** (Say).

Taken especially in undergrowth of trails and along tote roads and probably feeds on quite a varied list of food plants. State Forest Camp, Barber Point, July 3, 1920. Adults, collected at the Plains, Aug. 3, 1920.

Agallia 4-punctata Provancher.

Much less common than the preceding species and probably somewhat limited as to food plants, occurring in woods near the trails. It has been recorded as common on cultivated crops but may be considered of practically no economic importance for this region. State Forest Camp, Barber Point (adults), July 3, 1920. Wanakena, Aug. 12, 1920. Plains, Aug. 3, 1920.

Agallia oculata Van Duzee.

A single specimen taken here appears to be distinctly identical with the form described as *oculata*, the common range of the species being south and into the tropical parts of the continent.

Agallia sanguinolenta (Provancher).

A common species where clover or other legumes occur. In other localities this species is of very distinct economic importance as it attacks cultivated crops, but in the Cranberry Lake region it is only found in the trails or tote roads where introduced grasses or clover furnish it a good basis. Most of the individuals captured were rather small in size compared with the forms taken in other localities. Cranberry Lake in July and Aug., 1920. Plains, Aug. 3, 1920. Wanakena, Aug. 12, 1920.

Idiocerus amabilis Ball (Plate I, Fig. c.)

Quite common on willows, especially along Sucker Brook and in the East Flow on willows which overhang the water. Newly transformed adults are a brilliant yellow-green with golden luster. Head and pronotum brown with lighter marking; vertex solid green at sides, brown on central part except narrow whitish median stripe. The face for the upper part is like the vertex below the ocelli green. The antennae light green at base and the bristles dark; underneath, except for the mesothorax, brilliant green. The tarsi whitish with the spurs and claws black. Cranberry Lake, July 18-24, 1920. Wanakena, Ranger School, July 15 and Aug. 12, 1920.

Idiocerus formosus Ball.

Taken along stream and probably feeds on willows. Cranberry Lake, Aug. 3, 1920.

Idiocerus pallidus Fitch.

Common on various species of willow and one of the most abundant forms upon this plant. It is apparently not capable of

living on other food plants so that its economic importance is restricted to the value of the willow. State Forest Camp, July 2. Grasse River, July 22, 1920. Wanakena, Aug. 12, 1920.

Idiocerus suturalis Fitch (Plate I, Figs. *a* and *b*).

Forest Camp, July 2, 1920. Grasse River, July 22, 1920. Wanakena, July 29 and Aug. 12, 1920.

Idiocerus alternatus Fitch.

Common on poplars and willows and one of the more abundant forms of the genus. This occurs over wide territory and in a number of more or less distinct varieties. State Forest Camp, July 5, 1920. Grasse River, July 22, 1920.

Idiocerus subnitens Sanders and Delong.

Numerous specimens, taken at Barber Point on willow, 1917, 1919 and 1920. A few specimens were also collected on poplar, but *Salix* seems to be the preferred food plant. The insect was described from Wisconsin.

Idiocerus lachrymalis Fitch.

The nymphs of this species were quite abundant on aspen early in July. The adults appear later in the season so that the species may be counted fairly common and as it is most abundant upon the aspen its injury may be considered as limited to the latter tree. The egg punctures in the twigs and smaller branches occasion large swellings and distortions and no doubt weaken the limbs so that they are easily broken. State Forest Camp, July 2, 1920. Grasse River, July 22, 1920.

Idiocerus provancheri Van Duzee.

While this species has been taken on plants away from bogs in other regions, all of our specimens here have been from bog plants and this seems to be its restricted habitat, the special plants on which it occurs being *Viburnum* or *Cassandra*. This species is not abundant but a number of specimens have been taken at different points. State Forest Camp, July 5, 1920. Grasse River, July 22, 1920. Plains, Aug. 3, 1920.

Macropsis viridis (Fitch).

This is perhaps the most abundant of the genus and is found on almost every willow, that is, during the time they are in season, July and August. State Forest Camp, July, 1920. Grasse River, July 22, 1920.

Macropsis sp.

Cranberry Lake, 1920.

Macropsis basalis (Van Duzee) (Plate I, Figs. *e*, *f* and *g*).

This occurs in two distinct varieties (var. *basalis*), one in which the deep marking of the wings is limited to the base and the other

(var. *fumipennis*) there are either two distinct bars or the entire wing is dark smoky or brown. The two forms occur on the same trees (willows and aspen), and, in so far as could be noted, the varied specimens develop from identical larvae. Upon further rearing of the individual it would be desirable to confirm this point. They are so plentiful on aspen that they may be counted injurious. State Forest Camp, July 3, 1920. Grasse River, July 22, 1920. Wanakena, Aug. 12, 1920.

Macropsis canadensis (Van Duzee) (Plate I, Fig. *d*).

Taken on the willow, especially in the lower ground along region of lake or brook, but less abundant than some of the other species. Cranberry Lake and Barber Point, July 13, 1920.

Oncopsis variabilis (Fitch) (Plate I, Figs. *i* and *j*).

This is an extremely variable species and occurs in several different forms, the most abundant one being bright yellow with black strips along the claval suture. Its common food plant appears to be yellow birch, also white birch, and it has been taken in dense woods as well as along the margins of thickets of the forest. State Forest Camp, Barbers Point, July, 1920. Grasse River, July 22, 1920. Wanakena, July 29, 1920. Plains, Aug. 3, 1920.

Oncopsis sobrius (Walker).

This species is evidently common on the yellow birch and while this may not be its only food plant, it would seem to be the common one. But the species is less abundant than in Maine and does not rank with one or two of the other species of the genus as a forest pest if we may judge by its occurrence during the present season. Cranberry Lake, June 30, 1919.

Oncopsis cognatus (Van Duzee) (Plate I, Fig. *h*).

Specimens placed here were collected at Wanakena, Aug. 1-7, 1917. A number of other specimens collected at Barber Point from yellow birch, July 13-24, 1920, seem to agree structurally with this form but are quite uniformly cinnamon brown in color. They may constitute a variety or possibly a distinct species but it is desirable to have more biological data before multiplying species in this extremely variable genus.

Oncopsis fitchi Van Duzee (Plate I, Figs. *k* and *l*).

Very abundant on a variety of plant-hosts, especially birch, and apparently the most important species of the genus. Its attacks result in a drain upon the plants and egg punctures of this species are noted so abundantly on some trees as to become injurious. State Forest Camp, July 2, 1920.

Oncopsis pruni (Provancher).

Very few specimens have been referred to this species and these appear closely related to *fitchi*. Barber Point, July 17, 1920.

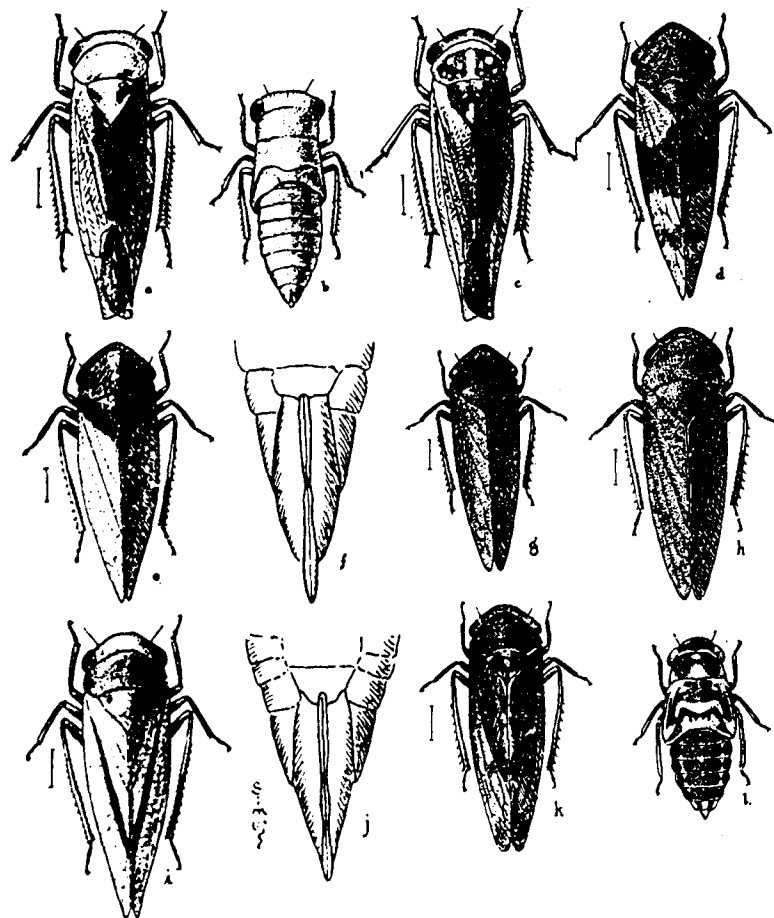


Plate I.

a, *Idiocerus suturalis* Fitch; b, *Idiocerus suturalis* — nymph; c, *Idiocerus amabilis* Ball; d, *Macropsis canadensis* Van Duzee; e, *Macropsis basalis* — female; f, *M. basalis* — female genitalia; g, *M. basalis* — female; h, *Onocopsis cognatus* Van Duzee — female; i, *Onocopsis variabilis* Fitch — female; j, *O. variabilis* — female genitalia; k, *Onocopsis fitchi* Van Duzee; l, *O. fitchi* — nymph last instar.

Oncopsis minor (Fitch).

Apparently one of the common forms on yellow birch but not easily separated from *fitchi*. Barber Point, July 9, 10, 13 and Aug. 2, 1920.

Oncopsis nigrinasi (Fitch).

State Forest Camp, Barber Point, July 5, 1920.

Oncometopia lateralis (Fabricius).

This species has a very wide range, occurring from Canada to the southern U. S. and infesting a great variety of plants. It lives in a great variety of habitats. At Cranberry Lake it was taken in the Plains region of the low ground along streams and on the hill tops, but occurred in greatest abundance at the "French Camp," Wanakena (Aug. 12, nymphs and adults were taken in large numbers). These were secured by sweeping grass and apparently the species was feeding in this location although possibly they may have developed on herbaceous plants in the immediate vicinity. Cranberry Lake, Sept. 15, 16, 1917; (nymphs and adults) July 28, 1920. Nymph-Plains, Aug. 3, 1920, and one adult Aug. 12, 1920. Grasse River, July 22, 1920. Wanakena, Aug. 1-7, 1917.

Cicadella gothica (Signoret).

Abundant in woods and along road-sides or trails on various plants. Doubtless a common feeder on many shrubs and trees in the forest association. Young nymphs abundant Aug. 6, Barber Point. Cranberry Lake, July 3, Aug. 5 and Sept. 15, 1917; July 2-14, 1920; (adults Aug. 1, 1917; (nymphs) July 15-31, 1920. Wanakena, Aug. 12, 1920. Plains, Aug. 3, 1920 (nymphs and adult).

Helochara communis Fitch

Usually very abundant in low places on *Juncus* which is probably its most common food-plant, although it may occur in other vegetation, especially in the adult stage. Cranberry Lake, Aug. 10, 1917. Wanakena, Aug. 3, 1920.

Graphocephala coccinea (Forst.).

Abundant in low vegetation in woods, especially in moist fern covered areas. Probably a general feeder on the plants of this association. Cranberry Lake, Aug. 5, 1917 (adult). State Forest Camp, July 2-10 (nymphs), July 24 (adults), 1920. Buck Island, Aug. 9, 1920. Wanakena, Aug. 1-7, 1917; Aug. 12, 1920. Wanakena, July 29, 1920 (nymphs and adults). Plains, Aug. 3, 1920.

Draeculacephala mollipes (Say).

This very common and abundant species, which ranges all the way from Canada to Central America occurs on a variety of grasses but usually in dry or moderately moist locations. In the forest it is found along trails, tote-roads and streams. Cranberry Lake, July 2, 3, 6, 23 and 26, 1917; July 2, 1920. Grasse River, July 22, 1920. Plains, Aug. 3, 1920. Wanakena, Aug. 12, 1920.

Draeculacephala manitobiana Ball.

This species has been taken along with the preceding in swamp meadows but it was the most abundant in the large swamp meadow of the Grasse River where it occurred on *Carex oligosperma* which (it would seem) must be the food plant for the young as well as

the adults. Barber Point. Grasse River, July 22, 1920. Wanakena, July 15; Aug. 12, 1920. Plains, Aug. 3, 1920.

***Draeculacephala noveboracensis* (Fitch).**

Abundant in the swamp meadows both at Barber Point and Grasse River. Perhaps the most common of the species occurring in this habitat and feeding upon some of the coarse grasses as *Calamagrostis*. Such plants must furnish their food supply as the nymphs are taken in the same locations and in large numbers, both nymphs and adults being found during the latter part of July and early August. Cranberry Lake, July 26, 1917; July 14, 1920 (nymphs and adults). Wanakena, Aug. 1-7, 1917; Aug. 12, 1920. Grasse River, July 22, 1920. Plains, Aug. 3, 1920.

***Evacanthus acuminatus* (Fabricius).**

Taken only in the forest and generally associated with ferns but this is not its probable host plant. Cranberry Lake, July 23, 1917. Wanakena, Aug. 1-7, 1917; July 29, 1920. Adults, Plains, Aug. 3, 1920.

***Gypona octo-lineata* (Say) (Fig. 18a, b, c, d and e).**

This species has very extensive distribution over the U. S. and Canada and occurs in a number of varieties which have been designated under different names. The ones most common in this region are the typical variety with distinctly reticulate wings, while the less reticulate forms are found more commonly in bogs or distinctly moist locations. A nymph taken on spruce with

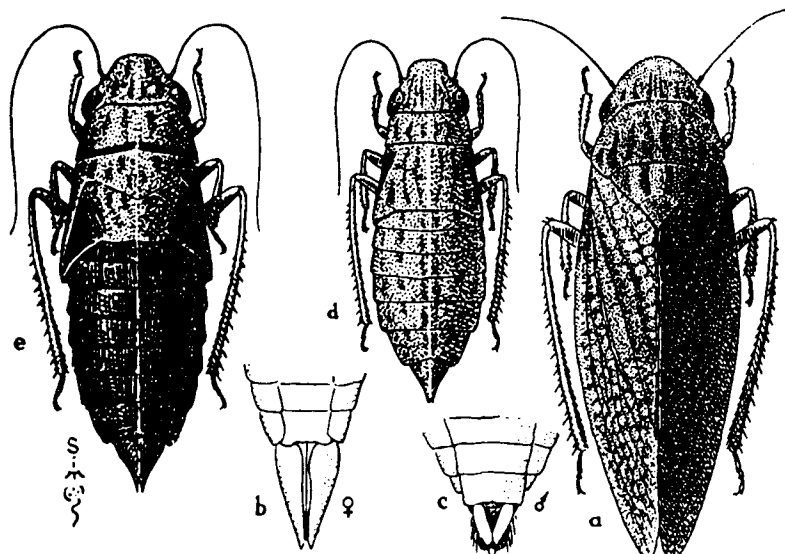


Fig. 18.—*Gypona 8-lineata* Say: a, adult; b, female; c, male genitalia; d and e, nymphs of later instars, probably 4th and 5th.

practically no other plants adjacent showed a striking resemblance to the color of the spruce leaves and also distinct marking of abdomen, having two very distinct black stripes so arranged as to parallel the lines of the leaves upon which the insect would attach itself. The species in general evidently has a very wide range of food plants. Cranberry Lake, Aug. 1; July 24, 1917. Buck Island, Aug. 9, 1920 (adult and nymph). Wanakena, Aug. 1-7, 1917; July 29, 1920; Aug. 12, 1920. Grasse River, July 22, 1920. Plains, Aug. 3, 1920.

***Aucephalus nervosus* (Schrank).**

An abundant species on meadow grasses but not common in the stations collected. In Maine, especially in the cultivated fields, it is so abundant as to be recognized as of distinct economic importance. Cranberry Lake, Aug. 1, 6 and 11, 1917. Silver Brook, Grasse River, July 22, 1920. Wanakena, Aug. 12, 1920.

***Aucephalus albifrons* (Linnaeus).**

Taken at Barber Point close to the Camp where timothy and other grasses furnish an abundant support. This species has been found to feed on the crown of timothy and it occurs commonly so far below the surface that it is seldom taken in ordinary sweeping. In cultivated fields it assumes very considerable importance. Cranberry Lake, Aug. 1, 1917; Aug. 6 and 9, 1920. Wanakena (French Camp), Aug. 12, 1920.

***Xestocephalus pulicarius* Van Duzee.**

Wanakena (Bean Pond), Aug. 12, 1920.

***Xestocephalus nigrifrons* Osborn.**

Wanakena (French Camp), Aug. 12, 1920.

***Parabolocratus viridis* (Uhler).**

Wanakena, Aug. 12, 1920.

***Parabolocratus major* Osborn.**

This species has been taken elsewhere upon *Calamagrostis canadensis* and as this grass occurs in the swamp meadows where it has generally been taken, it is probable that this has furnished its food in this locality. None have been taken except in the marsh meadows or similar locations. Cranberry Lake and Barber Point, July 3, 1919 (adult); June 9, 1920 (nymph). Wanakena, Aug. 1-7, 1917; July 15, 1920. Silver Brook, July 22, 1920 (adult).

***Mesamia vitellina* (Fitch).**

This species has been one of the most frequent captures of the less common forms and has been taken in sweeping maple and other undergrowth so that it has seemed probable that maple may be at least one of its principal foodplants. Nymphs associated

with these adults, and which resemble very closely those of *Thamnotettix kennicotti*, were thought to be the young of this species; and it is possible that the nymphs of the two forms are quite similar. One such nymph was kept in a cage and fed on maple leaves for about four weeks but it did not mature. Wanakena, Aug. 1-7, 1917; Aug. 12, 1920. Ranger School, July 15, 1920 (adult). Grasse River, July 22, 1920 (adult). Plains, Aug. 3, 1920.

Scaphoideus auronitens Provancher.

Nymphs, Plains, Aug. 3, 1920.

Scaphoideus scalaris Van Duzee.

This is a very common species west but occurs quite rarely in this region, only one record having been made. Cranberry Lake, Aug. 1, 1917.

Scaphoideus lobatus Van Duzee.

Usually taken on grasses in open wood. Cranberry Lake, Aug. 1, 1917.

Scaphoideus productus Osborn.

This appears to be about the most common species of the genus for this region, much more plentiful, if we can judge by our collection, than the following species which is the most abundant one for the country at large. Cranberry Lake and Barber Point, July 25, 28, 1917; Sept. 15, 1919. Wanakena, Aug. 1-7, 1917; Aug. 12, 1920; (nymphs) July 15 and Aug. 3, 1920. Bear Mountain, Aug. 15, 1920.

Scaphoideus immistus (Say).

Taken very rarely, although it is by far the most common and generally distributed species of the genus in the U. S. It is taken on willows and grape and these are probably to be included among its host plants. Cranberry Lake, Aug. 5 and 10, 1917.

Platymetopius acutus (Say).

A common and very widely distributed species equally at home in open fields or forest, on low land or hill top, evidently having a great latitude of food plants. It is perhaps the most universally distributed of any species of leaf-hopper taken in this region, appearing in almost every sweeping for almost every habitat studied. Cranberry Lake, Barber Point, July and Aug., 1920. Wanakena, Aug. 12, 1920.

Platymetopius acutus (Say) var. *cinnamomeus* Osborn.

This variety appears to grade into the typical form, but nymphs which have been reared to this form seem to have a fairly distinct marking and, as such nymphs are most abundant in boggy locations and seldom taken in higher altitudes, it would appear that

there has been a fairly distinct separation of the form from the common stock. Cranberry Lake and Barber Point, July and Aug., 1920. Wanakena, Aug. 12, 1920.

Platymetopius cuprescens Osborn.

Found in open grass covered places, usually the drier spots. Wanakena (Plains), Aug. 3, 1920.

Platymetopius magdalensis Provancher.

Found in boggy places, especially in the blueberry association. Cranberry Lake, Aug. 10, 11, 1920. Wanakena, Aug. 12, 1920.

Deltocephalus productus (Walker).

The food plant of this species must be the grass occurring on the high ridges, as the species has been taken only in such locations and along the plains where similar habitat occurs. It is very rare, few specimens having been taken, but very likely if its particular food plant were known a larger number could be secured. Cranberry Lake and Barber Point, Aug. 5, 1920. Plains, Aug. 3, 1920. (May be *delector* S. & D.)

Deltocephalus delector Sanders and DeLong.

Taken in company with *D. productus* on grasses growing on rather high ridges. Barber Point, Aug. 5, 1920. Plains, Aug. 3, 1920.

Deltocephalus configuratus Uhler.

An abundant species in grasses and widely distributed through the northern U. S. and Canada. Cranberry Lake and Barber Point, Aug. 1, 1917. Wanakena, Aug. 1-7, 1917; Aug. 12, 1920. Plains, Aug. 3, 1920. Ranger School, July 15, 1920.

Deltocephalus acus Sanders and DeLong.

Barber Point, Aug. 9, 1920. Plains, Aug. 3, 1920.

Deltocephalus ocellaris (Fallen).

This form which appears to be related to *Deltocephalus sayi* has been taken on grasses, on "tote roads" and on the plains. It differs from *D. sayi* in being much broader, the head shorter and wider and especially by the ivory-yellow or whitish markings on the clavus. Cranberry Lake, Barber Point, July 13, 1920. Wanakena and Plains, Aug. 3, 1920.

Deltocephalus sayi (Fitch).

This species is common in both open grass land and shaded grassy patches of forest. It is parasitized by Dryinids which doubtless serve as a considerable check to the multiplication of the species. Cranberry Lake, July 6 and Aug. 5, 1919; July 2-15, 1920. Wanakena, July 15; Aug. 12, 1920; Aug. 1-7, 1917. Grasse River, July 22, 1920. Plains, Aug. 3, 1920.

***Deltocephalus misellus* Ball.**

This species has been taken in large numbers in a number of different localities and has apparently a rather wide range of food plants, although in Maine it was observed most abundantly upon the Canadian blue grass. It is subject to considerable variation in color, some of the forms being distinctly blackish while others are quite pallid. Cranberry Lake, July 2-30, 1920. Plains, Aug. 3, 1920.

***Deltocephalus apicatus* Osborn.**

This species appears restricted here and elsewhere through the state by the host plant, *Panicum huachuchae*. Cranberry Lake, Barber Point, Aug. 9, 1920. Wanakena, Aug. 12, 1920.

***Deltocephalus inimicus* (Say).**

This species is one of the most injurious of the leaf-hoppers. Over cultivated meadows and pastures and throughout the dairy region it has a very considerable economic importance. While occurring on a large variety of grasses in the Cranberry Lake region, there is so little of the area devoted to agriculture that it may be considered of small importance. It is abundant in the grasses of the campus at the Summer Camp and Ranger School and in the forest around Wanakena, also in the Grasse River section. It is quite extensively parasitized, both nymphs and adults being noticed with parasites attached. Cranberry Lake, Barber Point, July 1, 1920. Wanakena, July 15, Aug. 12, 1920. Ranger School, July 15, 1920. Grasse River, July 22, 1920. Plains, Aug. 3, 1920.

***Deltocephalus abdominalis* (Fabricius).**

A common grassland species. Cranberry Lake, July 26, 1917. Wanakena, Aug. 1-7, 1917; Aug. 12, 1920. Ranger School, July 15, 1920. Grasse River, July 22, 1920. Plains, Aug. 3, 1920.

***Deltocephalus pascuellus* (Fallen).**

Very common in grasslands and sufficiently abundant to be of distinct economic importance. Cranberry Lake, July 20, 1917. Wanakena, July 15 and 29, 1920; Aug. 12, 1920. Ranger School, July 15, 1920.

***Deltocephalus melsheimerii* (Fitch).**

This species appears to be restricted for this area to a species of *Bromus* and occurred abundantly in the Plains, Aug. 3, 1920, and less commonly on Buck Island, Aug. 9, 1920, and the "French Camp" near Wanakena, Aug. 12, 1920.

***Deltocephalus striatus* (L.) (= *affinis* G. & B.).**

This species is very much less common than in the cultivated parts of the country where it is an abundant species in pastures and meadows. Cranberry Lake, July 5, 1920.

***Deltocephalus nominatus* Sanders and DeLong.**

Cranberry Lake, July, 1920. Plains, Aug. 3, 1920. Wanakena, Aug. 12, 1920.

***Deltocephalus sylvestris* Osborn and Ball.**

This has occurred as one of the most frequent species and in a variety of altitudes, but particularly in shaded or woodland grasses where it sometimes appears in very great abundance. It is quite extensively parasitized by dryinids. Cranberry Lake, July 28, 1917; Aug. 1, 1920. Wanakena, Aug. 1-7, 1920. Ranger School, July, 15, Aug. 12, 1920. Grasse River, July 22, 1920. Plains, Aug. 3, 1920.

***Deltocephalus flavo-virens* Gillette and Baker.**

Cranberry Lake, Sept. 10, 1917. Ranger School, July 15, 1920. Grasse River, July 22, 1920. Plains, Aug. 3, 1920.

***Deltocephalus nigriventer* Sanders and DeLong.**

In nursery at the Ranger School and on fine grass near Wanakena, July 15 and Aug. 12, 1920.

***Euscelis striolus* (Fallen).**

This species is confined to the wet ground or boggy places adapted to certain coarse grasses to which the species seems restricted. Plains, Aug. 3, 1920. Barber Point, Aug., 1920.

***Euscelis extrusus* (Van Duzee).**

Evidently prefers rather dry locations, rocky ridges or mounds where some grasses furnish its food supply. Cranberry Lake, Barber Point, July 20, 1917; July 28, 1919; July 3, 17, 1920. Wanakena, Aug. 1-7, 1917. Plains, Aug. 3, 1920.

***Euscelis deceptus* Sanders and DeLong.**

New to New York list. Wanakena (Ranger School), Aug. 12, 1920.

***Euscelis uhleri* (Ball).**

A rather rare species in this locality and of little economic importance. Plains, Aug. 3, 1920.

***Euscelis anthracinus* (Van Duzee).**

This very black species is by no means abundant but taken largely in low ground, the borders of bogs and in tote-roads. Evidently living upon the small grasses that have worked into the forest habitat. Cranberry Lake, Aug. 10, 1917; July 3, 1920. Wanakena, July and Aug., 1920.

***Euscelis arctostaphyli* (Ball).**

Reported as occurring, but evidently not common in this locality. Plains, Aug. 3, 1920.

Euscelis humidus (Osborn).

Apparently restricted entirely to the bog association and taken with the fine grasses which furnish its food support. Cranberry Lake, Barber Point, July, 1920. Wanakena, Aug. 12, 1920.

Euscelis vaccinii (Van Duzee).

Another bog species apparently restricted very closely to Cranberry or possibly occurring on other plants of similar character. Barber Point, Aug., 1920. Plains, Aug. 3, 1920.

Euscelis instabilis (Van Duzee).

Common in boggy situations. Cranberry Lake, Aug. 5 and 10, 1917. Wanakena, Aug. 1-7, 1917; Aug. 12, 1920.

Euscelis angustatus (Osborn).

In low ground on bog grasses and quite evidently limited to the bog association. Cranberry Lake, Barber Point, July and Aug., 1920. Grasse River, July 22, 1920.

Euscelis elongatus (Osborn).

Apparently rare as only a very few specimens have been taken. It was described from Maine where it occurred in similar boggy situations. Wanakena, Aug. 1-7, 1917.

Euscelis comma (Van Duzee).

Quite rare in this vicinity. Its food plant not noted but in Iowa it was taken on *Elymus*. Barber Point, July 5, 1920. Camp "tote road". Ranger School, July 15 and Aug. 12, 1920. Several specimens, including long and short winged females taken near Bean Pond in tote-road on low grass. Grasse River, July 22, 1920. Plains, Aug. 3, 1920.

Euscelis curtisii (Fitch).

This species is common throughout a large range of the country from Canada to the Carolinas. It is usually found in woodland tracts, generally where there is some moisture. Specimens have been taken at the camp in July and Aug., 1917 and 1920, also at various points in the higher ground around the Ranger School on Aug. 15, 1920, and at the top of Bear Mountain, Aug. 15, 1920, and upon other elevated crests. The species is of some economic importance.

Phlepsius decorus Osborn and Ball.

This species favors wet ground grasses but often taken on hill-sides around springs or in wet spots. A conspicuous instance is the taking of specimens on a high ridge in a very small patch of coarse grass and sedge at Cranberry Lake, Aug. 1, 1917; Aug. 5, 1920.

Phlepsius maculellus Osborn.

This species which has been very rarely observed, was described from a single male specimen taken in Maine. A single specimen was taken in 1917 (Barber Point) and a few specimens the present season, Barber Point, Aug. 11, 1920, appear to be all that have been collected. It is restricted to boggy areas and lives on one of the fine grasses of the bog association. Barber Point, 1917; Aug. 11, 1920. Wanakena, Aug. 12, 1920.

Phlepsius irroratus (Say).

This species is a very common one throughout the country on cultivated grasses and in meadows generally, but appears to be rare in this region; the only specimens taken are from the Grasse River, July 22, 1920, where there was an invasion of blue grass and timothy.

Phlepsius apertus Van Duzee.

This species seems to replace the preceding one in the northern or woods region as it is found very plentiful in Maine in locations where *irroratus* would seem to be the natural member. It was taken along the tote-roads and in meadows and where these grasses have any value it may be considered of economic importance. Cranberry Lake, Sept. 15, 1917; Aug., 1920. Wanakena, Aug. 12, 1920.

Phlepsius fulvidorsum (Fitch).

This is usually limited to the woodland associations but is taken in trails, roadways and on one occasion was taken at the Plains, Aug. 3, 1920, in a trail near open land but probably associated with nearby thickets. Barber Point, Aug. 1 and 18, 1917, and July, 1920.

Phlepsius solidaginis (Walker).

In this region the species has been taken only in the higher stations but in association with sedges and wet land grasses. In general it is found in swampy or wet land associations. Barber Point, Aug. 5, 1920. Wanakena (French Camp), Aug. 12, 1920.

Thamnotettix kennicotti (Uhler).

Both young and adult in this form have been frequently taken and while not absolutely sure as to all nymphs it seems to be one of the common species of the region. Cranberry Lake, Aug. 1, 1917; Aug. and July 28, 1919; reared Aug. 8, 1920; nymph common, Aug. 10, 1920. Wanakena, Aug. 1-7, 1917; Aug. 12, 1920.

Thamnotettix cockerelli Ball.

Heretofore recorded for Colorado and Maine. Swept at roadside probably from willow as its host plant in Maine was found to be *Salix rostrata*. The species is new to New York State list. Wanakena, Aug. 12, 1920.

Thamnotettix morsei Osborn.

A single specimen of this species has been found and its association is not known. Barber Point, Aug. 1, 1917.

Thamnotettix eburatus Van Duzee.

Only one locality, east from Barber Point, Aug. 11, 1920, is noted for this species and it is evidently quite rare. Its food plant is evidently the sweet gale as no other plant has been recognized in connection with it.

Thamnotettix belli (Uhler).

This is a northern and western species and not heretofore recorded for New York State. It has been recognized as most abundant in the Rocky Mountains. It occurs especially in woodland on undergrowth and this is considered as its definite habitat. Cranberry Lake, Aug. 1, 1917. Wanakena, July 15, 1920. Grasse River, July 22, 1920.

Thamnotettix belli var. **brunneus** Osborn.

This variety was described from Maine and has the same general association as the preceding species but differs particularly in the coloration. Wanakena, Aug. 1-7, 1917.

Thamnotettix waldanus Ball.

This is an inhabitant of the deep woods and has been found only on undergrowth in a dense forest and must be considered as restricted to this association. It was taken Aug. 29, 1920, especially among ferns but where maple seedlings and some other plants were present and it was hard to be certain of food plant.

Thamnotettix chlamydatus (Provancher)

This species has usually been taken on the borders of thickets or forest and was found along a woodland roadway on underbrush but its food plant is not definitely known. Plains, Aug. 3, 1920.

Thamnotettix pallidulus Osborn.

Cranberry Lake, July 17, 1920.

Thamnotettix cypraceus Osborn.

Differs from the typical form in lacking the tawny stripes on head and pronotum. Plains, Aug. 3, 1920.

Thamnotettix melanogaster (Provancher).

This is a very common species throughout the eastern part of the U. S. and found in patches of sedge or swamp grasses. Sedges are probably the usual host plant. Cranberry Lake, Barber Point, July and Aug. Grasse River, July 22, 1920.

Thamnotettix ciliatus Osborn.

Like other species of this group in the genus the species occurs in boggy places on sedge or coarse grasses. It is seldom taken but very likely occurs in abundance on a certain host plant at the proper season. Cranberry Lake (Hedgehog Pond), Aug. 11, 1920. Wanakena (Ranger School), Aug. 12, 1920.

Thamnotettix decipiens Provancher.

Common on marsh grass and sedges. The nymphs appear in late July and the adults in August and September, often in great abundance. Cranberry Lake, Aug. 1 and Sept. 15, 1917; July 30, 1920 (nymphs); Aug. 11, 1920 (adults). Plains, Aug. 3, 1920 (nymphs). Bear Mountain, Aug. 15, 1920.

Thamnotettix smithi Van Duzee.

This species seems to be much less abundant than *melanogaster* to which it is closely related. It occurs in low ground and in marsh upon grasses and sedges; it may be restricted to a certain species of food plant and consequently not often collected.

Thamnotettix placidus Osborn.

Fairly common though not abundant on marsh grasses and sedges of swamp meadow. Cranberry Lake, Aug. 1, 1917; July 28, 1919; July 30, 1920. Wanakena, Aug. 1-7, 1917. Plains, Aug. 3, 1920.

Chlorotettix unicolor (Fitch).

This form has been taken at many different locations and may be considered as one of the important species of the region; its occurrence on grasses is sufficient to make it of economic importance where these grasses have any value. Both young and adults live upon the grasses of the swamp meadows and form one of the most conspicuous features of these associations. Cranberry Lake, July 24 and 28, 1919; Aug. 5 and Sept. 15, 1917. Wanakena, Aug. 1-7, 1917. Plains, Aug. 3, 1920. Grasse River, July 22, 1920.

Chlorotettix lusorius (Osborn and Ball).

This species occurs in mixed grasses and sedges and so far as observed here prefers the higher locations but where there is considerable moisture and shade. It is too rare to be of economic importance. Barber Point, Aug. 5, 1920. Bear Mountain, Aug. 15, 1920.

Cicadula variata (Fallén).

Found only in wet shady woods on *Impatiens biflora* which is apparently its restricted host plant, at least for the nymphal stage. Cranberry Lake, Aug. 1, 1917; Aug. 10, 1920. Wanakena, Aug. 1-7, 1917.

Cicadula 6-notata (Fallén).

This is one of the most widespread and abundant of the leafhoppers occurring throughout northern Europe and a large part of North America, feeding upon a great variety of grasses, including among the others oats and cereal crops. In cultivated areas the species has a very distinct economic importance. It has been found pretty plentiful on the wild grasses as well as blue grass and timothy of the camp sites and vicinity. Cranberry Lake, July 3 and 6, 1919; Aug. 1, 1917. Wanakena, Aug. 1-7, 1917; July 15, 1920; Aug. 12, 1920. Plains, Aug. 3, 1920.

Cicadula pallida Osborn.

Has been taken very infrequently and only in bog associations where sphagnum and other distinctly bog plants occur. Cranberry Lake and Barber Point, Aug. 10, 1920. Wanakena, Aug. 1-7, 1917; Aug. 12, 1920.

Cicadula slossoni Van Duzee.

This species occurs in immense numbers and may be collected in boggy places. Wanakena and Ranger School, July 15; Aug. 12, 1920. Plains, Aug. 3, 1920.

Balclutha punctata (Thunberg).

Cranberry Lake, July 3, 6 and 25, 1919; Aug. 5, 1917; June 9 and July 23, 1920. Wanakena, Aug. 1-7, 1917; Aug. 12, 1920. Plains, Aug. 3, 1920.

Balclutha impicta Van Duzee.

This is by no means as common as the preceding species and is distinguished from it simply by the absence of spots. Wanakena, Aug. 1-7, 1917.

Alebra albostriella (Fallén).

This occasionally appears in large numbers on forest trees but has not been found abundant especially during the present season. Cranberry Lake, July 20, 1917. Wanakena, Aug. 1-7, 1917.

Dicraneura cruentata Gillette.

Wanakena, July 15, 1920.

Dicraneura mali (Provancher).

This is a meadow species, but it has not been found abundant in this region of Cranberry Lake.

Dicraneura fieberi (Loew).

Occasionally found in abundance on low-ground grasses and in some cases possibly sufficiently to be serious. Cranberry Lake, July 6, 1917; Aug. 1, 1917. Plains, Aug. 3, 1920.

Empoasca smaragdula (Fallén).

A common species in woodland, especially on poplars and willows. Cranberry Lake and Barber Point, on poplar, July 3, 1920.

Empoasca aureoviridis (Uhler).

A very abundant form on willows and poplars, often so abundant that it must cause a considerable loss in the growth of the plant. Cranberry Lake, July 6, 7, 1917; Aug. 4, 1919. Wanakena, Aug. 1-7, 1917. Plains, Aug. 3, 1920.

Empoasca atrolabes Gillette.

A very abundant widely distributed species on *Alder*. Also taken on *Corylus* at Ranger School, July 15, 1920. Cranberry Lake and Barber Point, July 25, 1917; July 15-30, 1920. Wanakena, Aug. 1-7, 1917. Plains, Aug. 3, 1920.

Empoasca coccinea (Fitch).

Very abundant on white pine and apparently limited to this tree except as occasionally adults have been taken on other plants in the same vicinity. Evidently of economic importance. Cranberry Lake, Aug. 8, 1917; July 8, 1919; July 8, 1920. Wanakena, July 29, 1920, on white pine in virgin forest.

Empoasca flavescens (Fabricius).

A very widely distributed species in Europe and U. S., especially through southern states. Our specimens were taken at Wanakena (Ranger School), Aug. 12, 1920, in sweeping brush along trail.

Empoasca birdii Goding.

Has been taken but rarely and its association has not been definitely placed. Cranberry Lake, July 5, 1917.

Eupteryx vanduzei Gillette.

Abundant on ferns, especially in shady woodland and a conspicuous member of the deep woods association; it has not been observed in more open land. Wanakena, Aug. 1-7, 1917; July 29, 1920 (deep woods on fern association).

Eupteryx flavoscuta Gillette.

Commonly taken by sweeping ferns either in low-land bogs or hill forest and deep woods, undoubtedly feeding on fern. Cranberry Lake, July 20; Aug. 5, 1917; July 5, 1920. Plains, Aug. 3, 1920. Wanakena, Aug. 1-7, 1917; July 29, 1920 (abundant in deep woods).

Eupteryx nigra Osborn.

This form has been merged as a variety under *flavoscuta* by McAtee and there are fairly good connecting forms but it is possible to find quite as complete intergradations with *vanduzei*; both

forms seem to have well marked differences in habitat but not in host plant. Wanakena, July 29, 1920, in deep wood on fern associations.

Typhlocyba querci (Fitch).

This species was described from oak, but it has a wide variety of host plants and in this region it must survive entirely on other species as the oaks are absent. It is sufficiently abundant to cause a definite drain upon the trees affected and does not seem to have any close limitations and habitat as it may be taken at various levels on birch and other trees. Cranberry Lake, July 25, 1917; July 10, 1920. Wanakena, Aug. 1-7, 1917; July 15, 29, 1920.

Typhlocyba querci var. **bifasciata** Gillette and Baker.

This variety, like the previous species, appears to have a wide range of food plants but has been noted as even more abundant than the species above. Cranberry Lake, Aug. 1, 1919; July 2, 25, 1920 (adult); Aug. 13, 1920. Wanakena, Aug. 1-7, 1917.

Typhlocyba lethierryi Edwards.

This has been taken only twice and is probably quite rare. Cranberry Lake, Barber Point, Aug. 5, 1920. Wanakena, July 29, 1920. One specimen (Wanakena), probably to be placed here, has distinct black dot on inner cross nervure.

Typhlocyba tenerrima (Herrich-Schæffer).

Very rare, as only a very few specimens have been found, but these have been collected in the woodland associations, generally where there is considerable moisture. Cranberry Lake, July 25, 1917; July 12, 1920. Wanakena, Aug. 1-7, 1917.

Typhlocyba rosae (Linnaeus).

This is a very abundant species on roses throughout the country; it occurs in this region on different forest trees but never in great abundance. The species is apparently capable of living in varied conditions although limited to thickets or woodlands where it has both shade and moisture. Barber Point, Aug. 13, 1920. Plains, Aug. 3, 1920.

Typhlocyba comes var. **comes** (Say).

Taken only rarely and then from trees along tote-roads. Barber Point, Aug. 5, 1920.

Typhlocyba comes (Say) var.

Cranberry Lake, July 18, 1917.

Typhlocyba commissuralis.

Cranberry Lake, July 30, 1920.

Typhlocyba obliqua (Say).

This species has been taken from a variety of trees but the nymphal stage has been observed only on fire cherry, which may be considered as at least one of its host plants. It is hardly abundant enough to be counted of much importance. Cranberry Lake, Aug. 1, 1917. Wanakena, Aug. 1-7, 1917; Aug. 12, 1920 Plains, Aug. 3, 1920.

Typhlocyba obliqua var. **noevus** Gillette.

Wanakena, Aug. 1-7, 1917.

Typhlocyba obliqua var.

Cranberry Lake, June 9, 1920.

Family FULGORIDAE

Scolops sulcipes (Say).

This is a common species in meadow associations of eastern United States but only one capture has been recorded for this region. The Plains, Aug. 25, 1920.

Elidiptera slossoni Van Duzee.

Breeds in dead (rotten) spruce and white pine; a more detailed account of this species is given under life history. Barber Point 1917. Proulx's Lumber Camp, July 18, 1920.

Cixius misellus Van Duzee (Fig. 19, b).

Like the preceding species this insect occurs in the forest associations especially among conifers and its nymphal stages are probably associated with such trees. Cranberry Lake, Aug. 6 1917. Plains, Aug. 3, 1920. Wanakena (Ranger School), Aug 12, 1920.

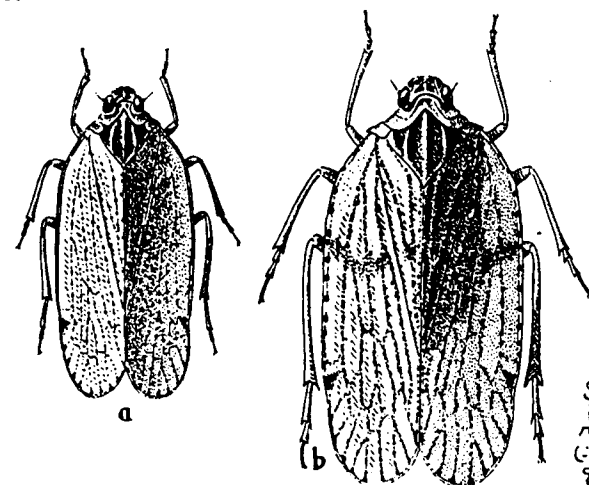


Fig. 19.— a, *Cixius pini* F L; b, *Cixius mesellus* Van D.

Cixius pini Fitch (Fig. 19, a).

Found among conifers especially spruce and usually in places where the spruce is bordered by boggy conditions. It seems probable that the larvae may be limited to some of the conifers for their support. Cranberry Lake, Aug. 2, 1917. Grasse River, July 22, 1917. Plains, Aug. 3, 1920. Ranger School, Aug. 12, 1920.

Bruchomorpha oculata Newman (Fig. 20, b and c).

This appears to be the most abundant species of the genus for this region and was taken in greatest abundance on the campus of the Summer Camp. Cranberry Lake, July 29-30, 1920. Wanakena, Aug. 12, 1920.

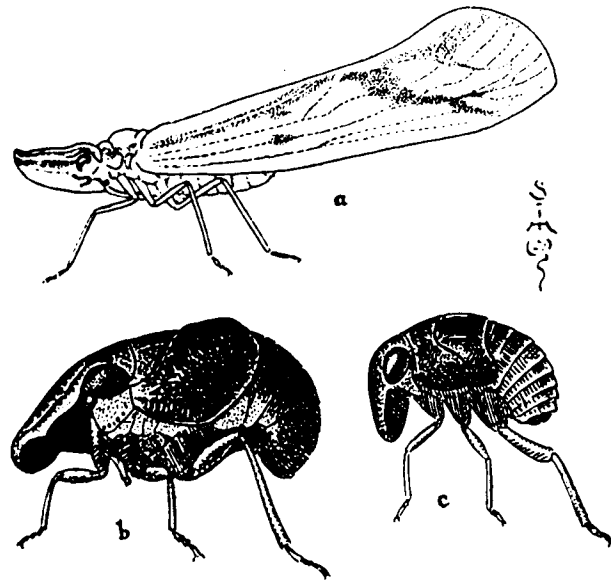


Fig. 20.—*Bruchomorpha oculata* Newman: a, adult; b, nymph; c, *Otiocerus coquerbertii* Kirby—side view of adult.

Aphelonema histrionica (Stal.).

This has been taken most commonly in connection with the plants associated with the snowberry but probably the fine grasses of the bog association furnish its food supply. Cranberry Lake and Barber Point, Aug. 10, 1920. Wanakena, Aug. 12, 1920.

Otiocerus coquerbertii Kirby.

This appears to be quite rare in this region as only a very few specimens have been taken. Barber Point, July 20, 1917. Wanakena, Aug. 12, 1920 (Fig. 20, a).

Laccocera vittipennis Van Duzee.

This is a very common form in swampy regions and was taken in greatest abundance at the Plains in the areas where there has evidently been little change of conditions for a long lapse of time. The food plant is probably some of the fine grasses but no particular species has been determined. Plains, Aug. 3, 1920.

Stenocranus dorsalis (Fitch).

Common to wide extent of eastern United States, but apparently much less common here than the following species. Barber Point, July 25, 1917.

Stenocranus felti Van Duzee.

Common to the northern woodlands where open sedge-covered spots are found. Cranberry Plains, Aug. 3, 1920.

Kelisia axialis Van Duzee.

Usually rather rare and found on sedge in lowland or swampy places. Barber Point, Aug. 17, 1919; Aug. 13, 1920.

Pissonotus dorsalis Van Duzee.

Taken at lower levels in grassy places. Plains, Aug. 3, 1920. Barber Point, Aug. 1, 1917.

Pissonotus ater Van Duzee.

Barber Point, 1920.

Liburniella ornata (Stal.).

This handsome little species was taken in small numbers in low grass lands. Cranberry Lake, July 5, 1920. Plains, Aug. 3, 1920.

Liburnia pellucida Fabricius.

A cosmopolitan species common to grass lands especially in more humid localities, but taken only rarely in this region. Plains, Aug. 3, 1920.

Liburnia puella Van Duzee.

This is one of the smallest species of the group, but often occurs in large numbers. It is confined to grassy, moist locations. Barber Point, Aug. 6, 1920.

Liburnia campestris Van Duzee.

An abundant species of wide range and no doubt a source of loss in meadows and pastures. Cranberry Lake, June 9, 1920. Wanakena, Aug. 1-7, 1917.

Liburnia lutulenta Van Duzee.

A common widely distributed species. Barber Point and Wanakena, 1920.

Family APHIDIDAE

This large and exceedingly important family has been given less attention than some of the other families, partly because the most important species have received extended investigation, partly due to the effort to clean up details of life history for some of the destructive but little known species in other families. No attempt has been made to collect the species occurring in the Cranberry Lake region.

The group is of remarkable interest on account of its unusual mode of reproduction, its enormous rate of multiplication and the many puzzling phases of its attacks on different hosts, seasonal migrations, alternate hosts, etc., which cannot be taken up in detail within the limits of this paper.

Ecologically, they may be characterized as uniformly plant feeders. Most of the species, practically all for this region, attack leaves, twigs or smaller branches. They multiply so rapidly and form such large colonies that the drain on the plant from the constant sucking of sap frequently results in wilting or withering of plant infested. Such species as the Pine chermes, Alder blight

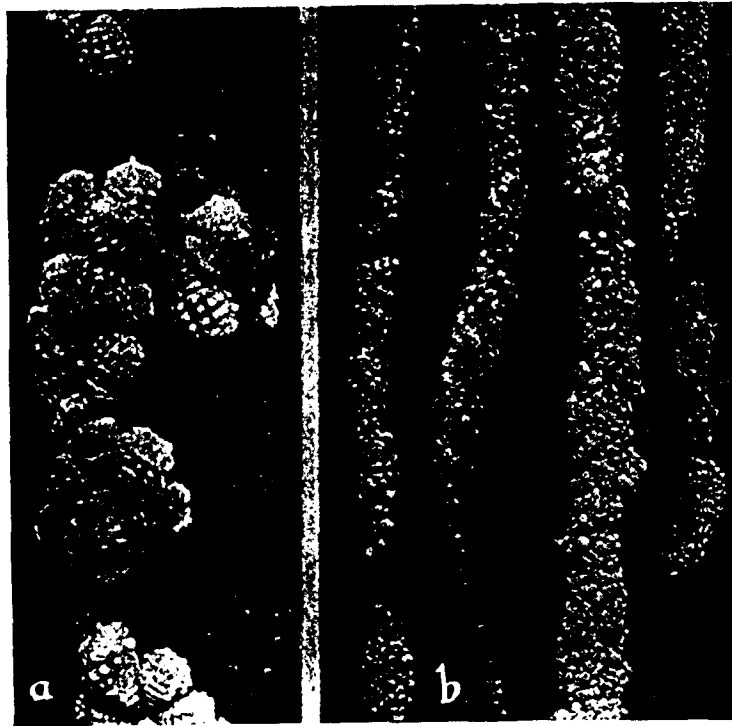


Fig. 21.—Alder blight. *Pemphigus tessellata*: a, much enlarged; b, about natural size. Photo by Drake and Fivaz.

and Beech blight become very conspicuous on account of the formation of great quantities of cottony or wooly covering, the waxy filaments being secreted by special wax-glands of the dorsal part of the body (mainly located on back of abdomen).

One of the ecologic associations of special interest is found in the very frequent, almost universal, presence of ants attending the colonies of aphids, the ants utilizing the "honey dew" secretion from the aphids as food. The numerous predaceous and parasitic insects assisted by spiders and birds destroy immense numbers of plant lice and thus the enormous reproductive powers of the aphids are counterbalanced and kept down to such an extent that the plants on which they feed have some show of survival.

Hormaphis papyraceae lives on willow birch and corresponds well with the description of gall by Oestlund. The galls consist of a distinctly corrugated structure between the leaf veins and contains numerous dark brown or black aphids. *Callipterus betulaecolens* (alate individuals, and various sizes of nymphs and wingless adults) were found in some of the galls occurring on yellow birch leaves, but more commonly entirely independent of the galls and evidently in the galls by accident.

Family CHERMIDAE

These interesting little insects form a quite conspicuous element in the insect fauna of the Cranberry Lake region, especially *Psyllia floccosa*, *trimaculata* on fire cherry, and *carpinicola*, apparently on numerous host plants, being taken in immense numbers. All the species are leaf feeders, living on the under surface of the leaves. The common gall making species occurring on hackberry trees are wanting here as the host plant does not occur.

A very striking feature is presented in the white cottony masses covering the bodies of the nymphs in *P. floccosa* on alder and *P. 3-maculata* on fire cherry. The latter form may be counted as destructive and merits a more detailed study of life history and ecology for economic reasons.

Aphalara veaziei Patch.

Cranberry Lake, July 5, 1920; June 9, 1920.

Trioza nigrilla Crawford.

This species is widely distributed and a fairly common species on willows. Cranberry Lake, Aug. 4, 1919.

Psyllia striata (Patch.)

I refer here a very abundant species occurring commonly on yellow birch, but as adult found on a wide variety of plants. Nymphs with small flocculent covering have been noted on birch leaves, but I have not verified the connection. Evidently very close to *carpinicola*. Cranberry Lake, July 2-25, 1920.

Psyllia carpinicola (Crawford).

The species occurs in great abundance and a great variety of trees, but was especially plentiful as adults on yellow birch, white pine and fire cherry. Barber Point and Cranberry Lake, July 8, 14 and 28, 1919; July 8-25, 1920.

Psyllia floccosa Patch.

Cranberry Lake, Barber Point, Plains, Childwold and Ranger School in abundance on alder. Agrees with description of *floccosa*, especially in genitalia. No nymphs with flocculent covering seen on alder at camp, but these may have matured before my arrival. The Ranger School specimens were taken in alder clump on rocky hillside which was very moist during July and August, 1920.

Psyllia 3-maculata Crawford (Figs. 42 and 43).

A very abundant form on great variety of plants in adult stage. Nymphs, the flocculent form, are very abundant on *Prunus pennsylvanica*. The adults have more or less varying shades of yellow to red on thorax (*trimaculata* — see life history notes).

HETEROPTERA IN THE VICINITY OF CRANBERRY LAKE

BY CARL J. DRAKE

Family SCUTELLERIDAE

Homaemus aeneifrons (Say) (Fig. 22, b)

This insect is the most common species of the *Scutelleroidea* occurring in the vicinity of Cranberry Lake. Nymphs and adults have been taken during June, July, August and September, but most of the immature forms attain the adult state before September. The species is quite generally distributed, but it is by far more abundant in the neighborhood of low marshy meadows and swamps. Van Duzee (*l. c.*, p. 548) states that the insect is very generally distributed and common in the Adirondacks where there were low, marshy spots with carices intermixed with swampy grasses. He took an adult upon a species of *Scirpus* on the summit of Cobble Hill.

This *scutellerid* is quite variable in both size and color. The color varies from pale yellow or dull to quite dark or blackish forms. The dull or glossy or pale color-forms are often more or less variegated with fuscous or black, thus giving the insect a marbled appearance. The size ranges from 6.5 mm. to 9.5 mm. in length.

Eurygaster alternatus (Say).

Four specimens, taken at Wanakena and Barber Point near a grassy bog in an old burn. Osborn collected a specimen while sweeping in the Grasse River Bog.

Family CYDNIDAE

Thyreocoris ater (Amyot and Serville).

Two specimens: Barber Point and Wanakena, July, 1920.

Thyreocoris pulicarius (Germar).

One specimen, taken on grass, July 30, at Wanakena in an old burn.

Sehirus cinctus (Palisot de Beauvois) (Fig. 22, a).

Barber Point, Wanakena and the Plains. This insect is not uncommon and feeds upon weeds growing in small open areas. Specimens have been collected during June, July, August and September.

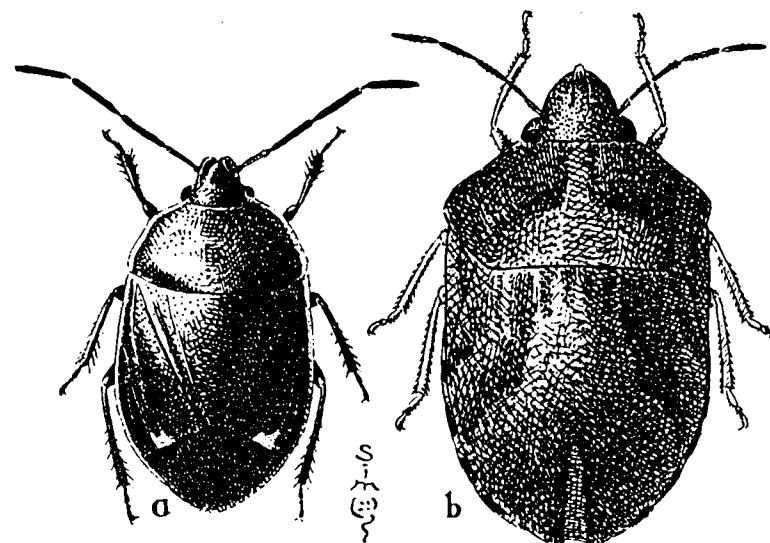


Fig. 22.— a, *Homaemus aeneifrons* (Say); b, *Sehirus cinctus* P. B.

Family PENTATOMIDAE

Sciocoris microphthalmus Flor.

Eight specimens, taken during July and August while sweeping grasses and rank weeds at Barber Point and Wanakena. I have very carefully collated the specimens with a male and female in the late Puton's collection (from Paris Museum) and find the American specimens identical with European examples determined by the late Puton. This seems to be the only record for New York State. The insect has been recorded for Ontario, New Hampshire, Maine, Michigan and Minnesota.

Peribalus limbolaris Stal.

One example, collected at the Plains, July, 1920.