

## NOTES ON NORTH AMERICAN PSYLLIDÆ.

## PART I.

By E. A. SCHWARZ.

[The following series of descriptions was included in a Synopsis of the North American Psyllidæ prepared by myself, at the request of the late Dr. C. V. Riley, in the years 1886 and 1887, but which has never been published. With the accumulation of material collected of late years in various parts of the United States and now preserved in the collections of the U. S. Department of Agriculture and the U. S. National Museum, the Synopsis has become greatly antiquated, but it is my intention to revise and publish certain portions thereof, as well as to rescue from oblivion some fine drawings made for the Synopsis by the late Dr. Geo. Marx. This is done by the kind permission of Dr. L. O. Howard, Chief of the Bureau of Entomology, U. S. Department of Agriculture.]

I. NORTH AMERICAN SPECIES OF THE GENUS EUPHYLLURA  
FÆRSTER.

This genus belongs to the subfamily Aphalarinæ Fr. Læw, and is very readily recognizable. The head has, in front of the anterior ocellus, two transverse lobes which are as wide as the vertex, contiguous throughout and, at their anterior edge, either conjointly truncate or slightly rounded separately. They are either connate with the vertex or more or less indistinctly separated therefrom. The anterior ocellus appears, therefore, to be remote from the anterior margin of the head, and is visible only from above. The anterior wings are of rhomboidal form, *i. e.*, suddenly widening at base, thence nearly parallel, apex not regularly rounded; tip of wing, therefore, close to the anterior margin. Genital plate of male without lateral appendages.

This genus contains a few European species; in North America it seems to be confined to the Pacific slope. Our species may be distinguished as follows:

## TABLE OF SPECIES.

Vertex flat; frontal lobes almost connate with vertex; wings entirely coriaceous; radius and 3d and 4th furcals straight or nearly so; 2d marginal cell triangular.

Wings entirely brownish red, or with obsolete whitish spots, or with transverse white fascia; veins and sculpture of wings distinct,

*arctostaphyli*, n. sp.



Wings entirely snow-white or cream-white; veins and sculpture of wings indistinct..... var. *niveipennis*, n. var.

Vertex a little convex anteriorly, frontal lobes narrow and more distinctly separated from the vertex; wings submembranaceous at apical half; radius and 3d and 4th furcals greatly undulated, 2d marginal cell reniform..... *arbuti*, n. sp.

### *Euphyllura arctostaphyli*, n. sp.

Length 2.4-2.8 mm. Head and thorax reddish brown, or brownish red, or brownish yellow, abdomen blood-red, femora honey-yellow, tibiae reddish, wings dark brown, or reddish brown, either uniformly so, or more or less maculated with whitish, or with a transverse white fascia at basal third. Subopaque, not pubescent; head strongly obliquely deflexed, more or less distinctly rugoso-punctate; vertex posteriorly nearly straight, arcuately narrowed each side at insertion of antennæ, anterior margin straight, and even not sinuate at the ocellus, at middle hardly as long as half its width at base, surface flat, discal impressions punctiform, moderately deep; genæ prominent in front of eyes causing the vertex to appear dentate each side; frontal lobes not, or very indistinctly separated from the vertex, nearly half as long as the latter, contiguous throughout, not narrowed apically, rounded at the sides, at anterior margin conjointly nearly truncate, or separately feebly rounded; eyes moderately convex, not globose; antennæ a little shorter than head and thorax together, nearly filiform, basal joints reddish, intermediate joints pale, terminal joints usually blackish and very little thicker, third joint fully one-third longer than the fourth.

Surface of thorax finely and densely punctulate, but the sculpture is often obsolete; pronotum and dorsulum strongly ascending posteriorly, the former comparatively long with the posterior edge slightly emarginate; dorsulum small, but little longer than pronotum and nearly three times wider than long; mesonotum hardly descending posteriorly, distinctly longer than dorsulum, without distinct markings.

Wings about  $2\frac{1}{4}$  times longer than wide, suddenly widened at base, then parallel, the apex suddenly and narrowly rounded near anterior costa, then obliquely arched and gradually merging into the posterior costa; opaque, leathery, with fine, sparse transverse rugæ and still more finely rugulose between the rugæ; costa sinuate at outer portion of anterior basal cell and slightly indented at terminus of first furcal; veins moderately prominent, becoming finer apically; cubitus a little longer than

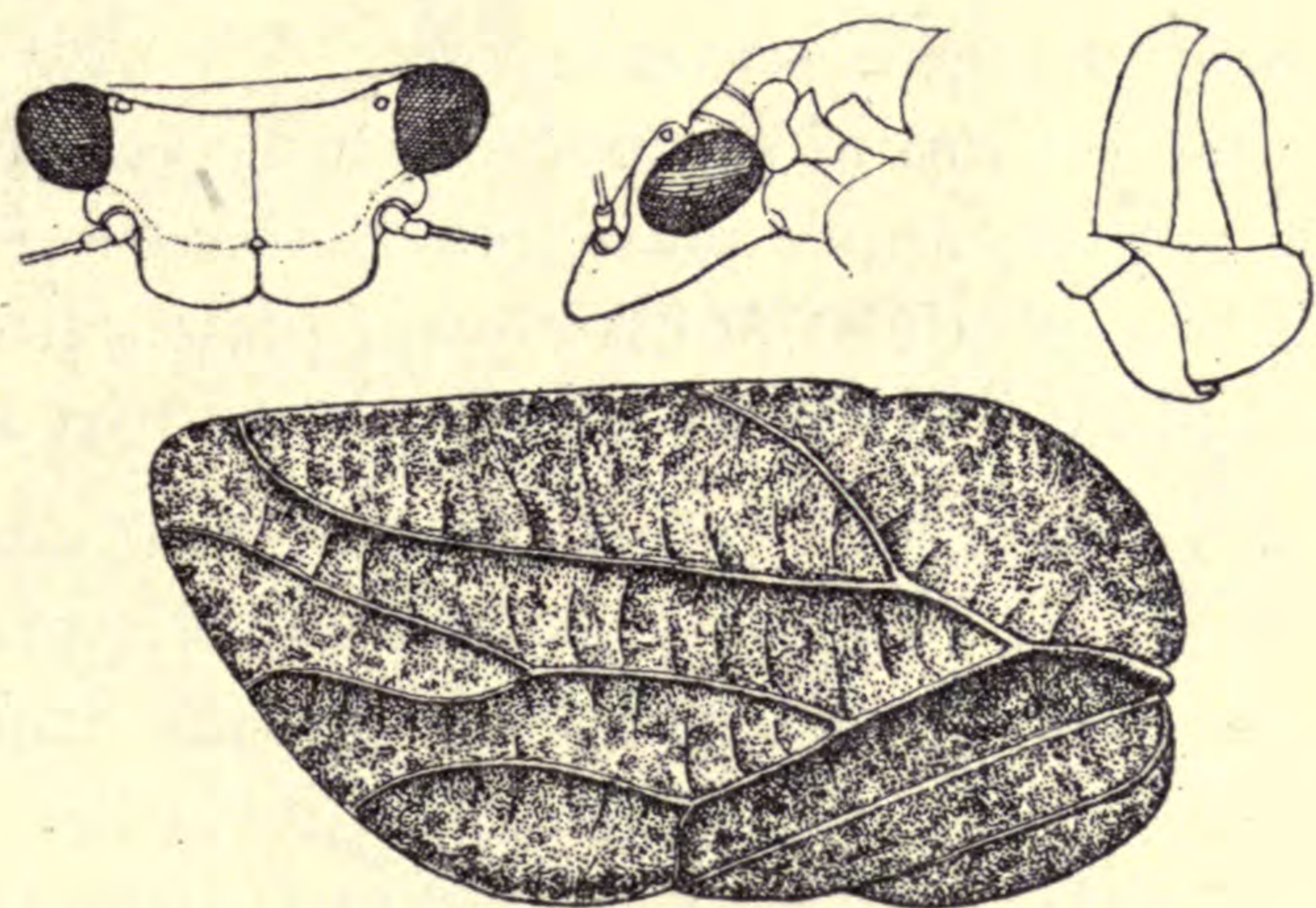


FIG. 6.—*Euphyllura arctostaphyli*.



discoidal part of subcosta, radial part of subcosta very fine and often obsolete at terminus; no distinct pterostigma; radius straight and only curved at tip, running into the anterior costa; stem of first fork as long as cubitus, stem of second fork twice longer than that of the first, straight and parallel with radius; first furcal twice shorter than the stem, terminating rectangularly on the costa, second furcal very long, three times longer than the first, forming a right angle therewith, gently curved at outer half and ending very obliquely on the costa, third furcal a little shorter than the second, slightly undulated; fourth furcal longer than the second or third, nearly straight and as long as the stem of second fork; tip of wing half way between radius and fourth furcal; radial cell very high; marginal cells large and of nearly equal size, though quite different in shape.

♂.—Genital plate very tall, much longer than the genital segment, without lateral appendages, front edge slightly convex, hind edge slightly sinuate near tip which is subtruncate, with the posterior angle acute and projecting posteriorly; forceps a little lower than the plate, simple, slightly widening from base to near the tip which is rounded, front and hind margins straight.

♀.—Genital segment as long as the three preceding ventral segments together, upper plate gently narrowed posteriorly into a moderately long acute, straight point; lower plate a little wider and shorter than the upper one, lower edge ascending, tip short acute.

Described from numerous specimens collected by Mr. A. Koebele in Placer county, Cal., on *Arctostaphylos pungens*, during the months of September and October, and at Marble Valley, Cal., in the middle of July. The specimens from the latter locality are a little darker than those from Placer county. It occurs also in the mountains of southern Arizona (Hubbard and Schwarz).

*Type*.—No. 8143, U. S. National Museum.

Besides the variations in the color of head, thorax and wings referred to above, a remarkable variety occurs in California which may be readily mistaken for a different species and which, for this reason, deserves especial mention and a distinct varietal name.

**Var. niveipennis, n. var.**

Color of head and thorax just as variable as in the form described above, usually pinkish red, or brownish yellow, or brownish red, thorax usually a little darker, surface of head and thorax often a little shining, sculpture usually less evident. Wings snow-white, the posterior costa sometimes margined with red or tessellated with minute red spots, surface having the appearance of being covered with fine white powder, which causes the venation to be less distinct than in the typical form and the sculpture to become obsolete. The sinuation of the costa in anterior basal cell is absent; abdomen and legs uniformly yellow. Sexual characters as in the typical form.



Found by Mr. Koebele in large numbers in company with the typical form, and also in Los Angeles county, Cal. Three specimens from the latter locality, collected in May, are without the white powder-like substance on the wings and the transverse rugæ are as plain as in the typical form.

*Type*.—No. 8144, U. S. National Museum.

***Euphyllura arbuti*, n. sp.**

Length 2.6 mm. Above yellowish red, sometimes with a tinge of brown, genital segment, underside and legs honey-yellow, wings bicolored. Head large, strongly obliquely deflexed, more or less shining, finely rugose, posterior edge slightly emarginate, vertex at middle slightly shorter than half its width at base, posterior part flat, genæ prominent, discal impressions deep, subtransverse, smooth at bottom, vertex in front of them distinctly convex, causing the frontal lobes to appear to be depressed below the level of the vertex and to be separated therefrom; frontal lobes usually pale yellow, a little shorter than in the preceding species, antennæ a little longer than in the preceding, pale yellow, dusky at tip.

Surface of thorax subopaque, finely and obsoletely alutaceous, without distinct markings, middle of dorsulum and mesonotum usually darker; pronotum strongly ascending, lateral impressions very conspicuous; dorsulum also strongly ascending, larger than in the preceding, front and hind margins equally arched; mesonotum at middle slightly convex longitudinally.

Wings less suddenly widened at base, a little more rounded at apex, and therefore less rhomboidal than in the preceding; surface very little shining, transversely rugose between the veins, rugæ and interstices finely rugose, radial cell, the larger portion of discoidal cell, posterior basal cell and clavus pale yellow and tolerably transparent, the rest of the wing brown and hardly transparent. At the apical portion of the wing the two colors are not sharply divided. Cubitus a little longer than discoidal part of subcosta, both strongly prominent, straight, radial part of subcosta as long as discoidal part and becoming nearly obsolete at apex; no pterostigma; radius fine, strongly undulated and running into anterior costa; stem of first fork shorter than the cubitus, stem of second fork as long as cubitus; first furcal extremely short, terminating nearly perpendicularly upon the costa, second furcal three or four times longer than the first, gently curved and terminating obliquely upon the costa, third and fourth

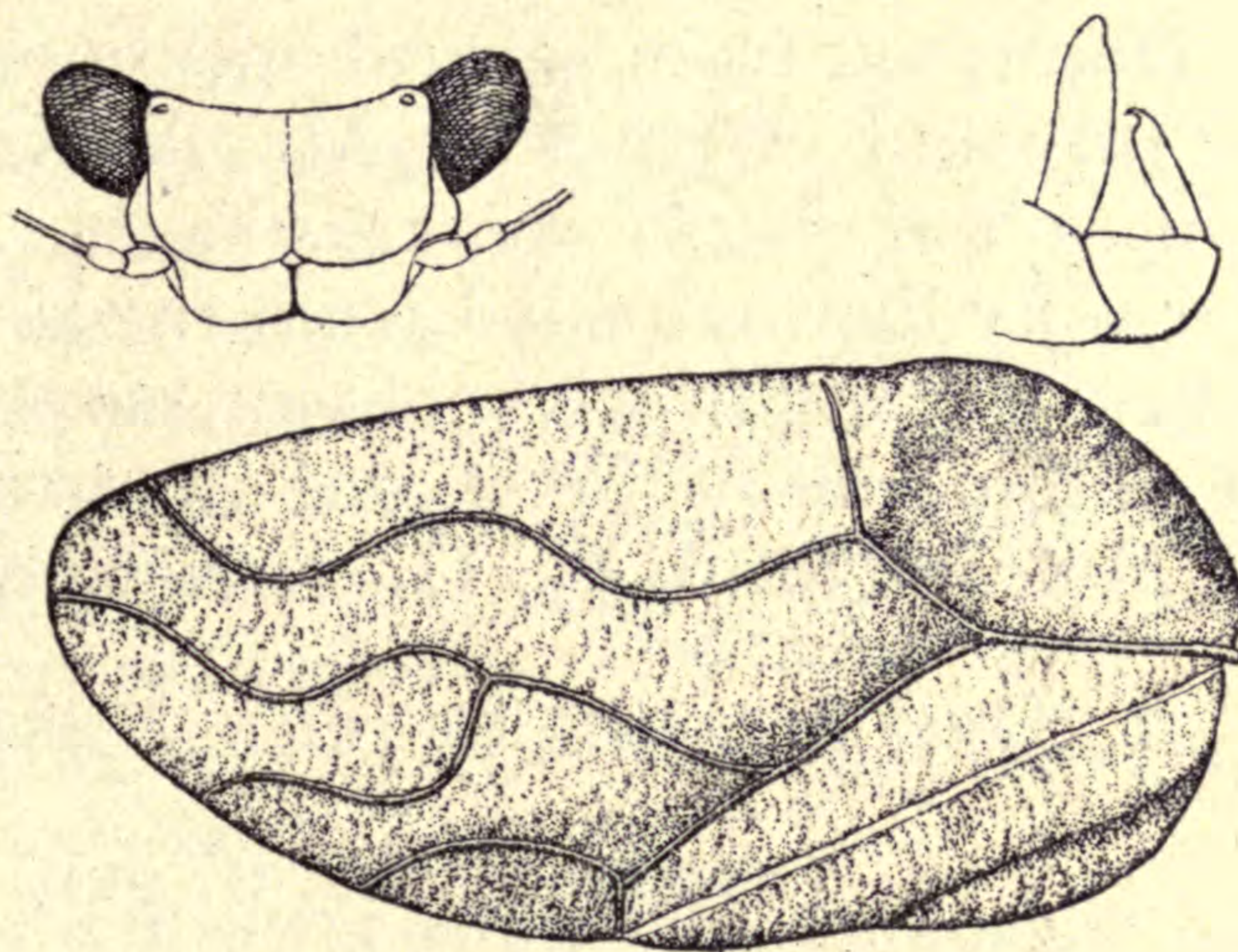


FIG 7.—*Euphyllura arbuti*.



furcals extremely long, the former forming a right angle with the stem, straight for about one-third its length then suddenly bent and slightly undulated near terminus, fourth furcal longer than the third and also longer than the stem, strongly undulated; tip of wing between radius and fourth furcal; second marginal cell reniform in outline and much larger than the first which is  $2\frac{1}{2}$  times longer than high.

♂.—Genital plate longer than the genital segment, simple, moderately wide, anterior edge nearly straight, tip very narrowly rounded, posterior edge slightly convex; forceps narrower and nearly one-third lower than the plate, posterior edge straight, anterior edge also straight but near the tip suddenly sinuated, tip appearing as a minute blackish hook which points forward.

♀.—Genital segment longer than in *E. arctostaphyli*, upper plate very gradually narrowed into a straight, moderately acute point; lower plate hardly wider but decidedly shorter than the upper one, gradually narrowed into an acute point, lower edge gently ascending.

Described from several specimens collected during the months of July and August by Mr. A. Koebele in Santa Cruz county, Cal., on *Arbutus menziesii*.

Easily distinguished from the preceding by the shorter frontal lobes, the anteriorly convex vertex, the form of the wing, the venation and by the sexual characters.

*Type*.—No. 8145, U. S. National Museum.

## 2. DESCRIPTION OF THE NEST-CONSTRUCTING PSYLLID.

(*Euphalerus*, n. gen.; *nidifex*, n. sp.)

At a previous place in this volume (pp. 153–154) a short characterization (accompanied by a figure), will be found of the peculiar habit of the larva of this Psyllid, and the following lines are copied from a description of the perfect insect drawn up by myself in 1887:

**Euphalerus**, n. gen. (subfamily Aphalarinæ).

Body glabrous, stouter than in *Psyllopsis* or *Aphalara* but much less so than in *Euphyllura*. Head deflexed vertically or nearly so, vertex slightly emarginate posteriorly, not narrowed at the sides, at middle half as long as its width at base, anteriorly slightly obliquely truncate each side of median line; frontal cones present, triangular, contiguous at base, slightly diverging apically, not depressed below the level of the vertex and separated therefrom only by a finely impressed line; antennæ very thin but less slender than in *Psyllopsis*, slightly clavate at tip.

Surface of thorax very convex longitudinally; pronotum nearly vertical, dorsulum strongly ascending posteriorly, mesonotum longitudinally convex posteriorly. The transverse convexity of the parts of the thorax is also greater than in *Psyllopsis*.



Wings membranaceous, oblong-oval, subhyaline, shining, smooth, toward the apex with sparse shallow impressed points, gently widening at base, then of nearly equal width, regularly rounded at apex, tip between radius and fourth furcal close to the latter; veins very prominent, cubitus a little shorter than discoidal part of subcosta, a distinct, moderately long pterostigma, radius nearly straight throughout; stem of second fork curved and not parallel with radius, second furcal much longer than any of the other furcals; first marginal cell much larger than the second. Genital parts of male without appendages or lobes, genital plates of female simple.

Agrees with *Psyllopsis* in the presence of frontal cones, but differs by the much greater deflexion of the head, with the frontal cones not depressed below the level of the vertex, the shorter antennæ, the greater convexity of the thoracic surface, the venation and by the sexual characters.

### **Euphalerus nidifex**, n. sp.

Length 2 mm. Color pale ochre-yellow varying to greenish yellow or reddish yellow, head, thorax, wings and legs speckled with minute black or brown dots, wings slightly whitish. Surface opaque, impunctate, vertex of the form described above, surface flat, discal impressions nearly obsolete, frontal cones nearly as long as the vertex, very little diverging, not acute at tip; antennæ not reaching to the posterior margin of mesonotum, pale yellow, tips of intermediate joints and terminal joints black, 3d joint one-fourth longer than the 4th, 9th and 10th small and forming a distinct club.

Dorsulum more than twice wider than long at middle, front and hind margins nearly equally rounded; mesonotum barely as long as dorsulum, decidedly descending posteriorly, convex transversely.

Wings gently widening at base, thence remaining of nearly equal width,  $2\frac{1}{4}$  times longer than wide, regularly rounded at apex, slightly whitish, transparent, not rugose, but the small black dots are impressed at the outer part of the wing; veins strong, pretty regularly tessellated with brown dots; stigma moderately long, narrow and not different in coloration; radius straight and only at terminus slightly curved anteriorly; stem of second fork nearly twice longer than that of the first fork; first furcal as long as cubitus, terminating obliquely on the costa, second furcal twice longer, nearly straight at basal half, then suddenly curved and terminating obliquely on the costa, third and fourth furcals of equal length, each about one-third longer than the first; first marginal cell quadrangular rather than triangular and much larger than second marginal cell; tip of wing close to fourth furcal within discoidal cell.

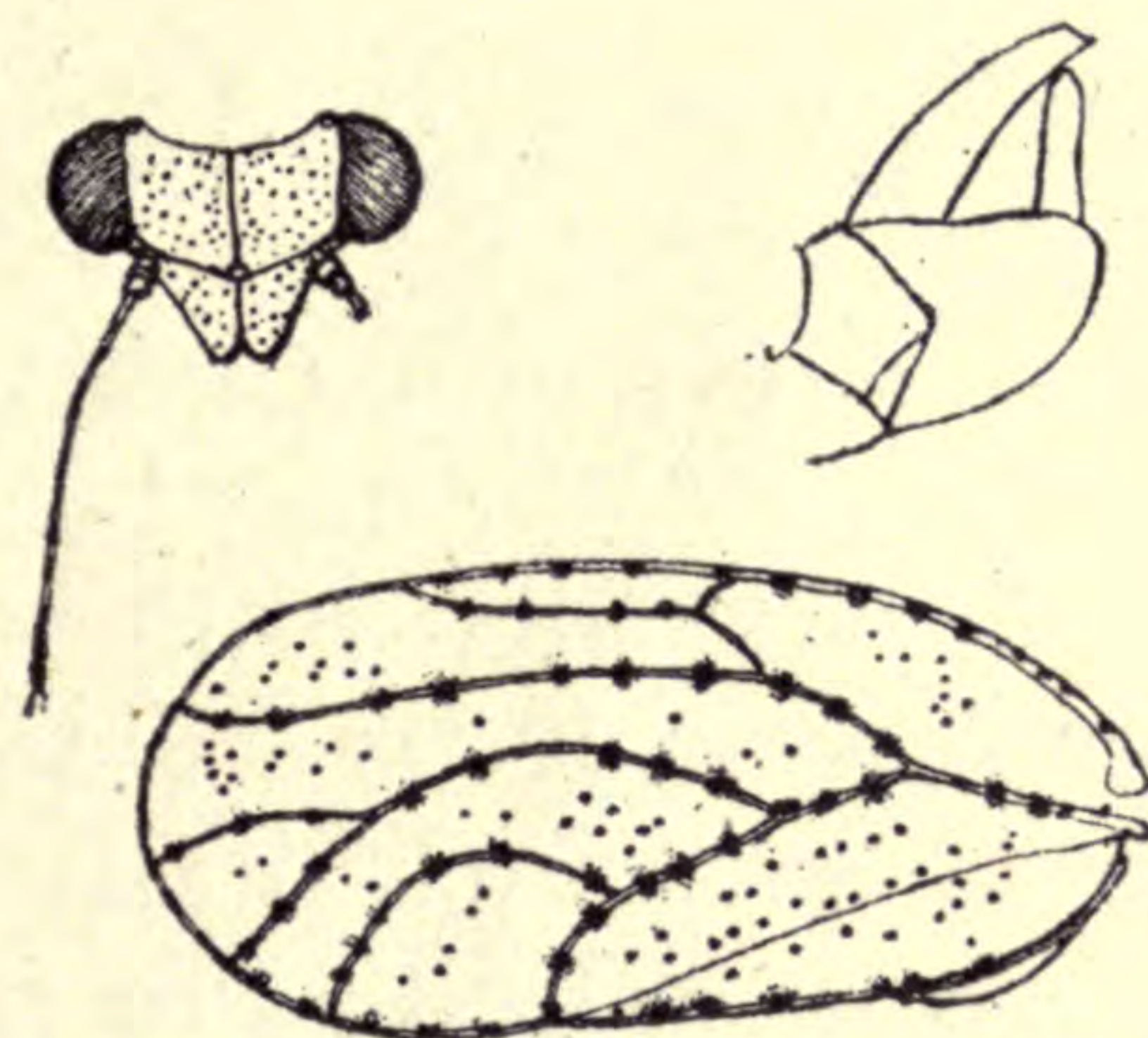


FIG. 8.—*Euphalerus nidifex*.



♂.—Genital plate longer than the genital segment, simple, gradually narrowing apically, front margin convex, posterior margin concave, tip subtruncate and pointing posteriorly; forceps distinctly lower and much narrower than the plate, straight, hardly narrowing apically, tip subacute, black.

♀.—Genital segment about as long as the three preceding ventral segments together, upper plate higher than the lower plate, gradually narrowing posteriorly and produced in a long, straight and acute point; lower plate distinctly shorter than the upper plate, gradually narrowing posteriorly and acute at the tip which points upwards.

Originally found by myself on the Island of Key West, Fla., in April, 1887, but subsequently (in 1903) bred in great numbers from larval cases found at the same place and at Cayamas, Cuba, on the leaves and young shoots of *Piscidia erythrina*.

*Type*.—No. 8146, U. S. National Museum.

### 3. THE SUMAC PSYLLIDÆ OF THE UNITED STATES.

(GENUS *Calophya* Fr. Læw, subfamily Psyllinæ.)

This genus, founded upon a single European species, is easily recognizable by the peculiar formation of the head; the vertex is, at its anteriorly half, longitudinally convex, and therefore anteriorly inverted; the frontal cones or lobes which are of varying length but always shorter than the vertex, thus appear to be inserted on the underside of the head and they form a distinct angle with the vertex. Anterior ocellus not or barely visible from above. Antennæ short and stout, at most as long as the width of the head. Wings of varying shape, either smooth or indistinctly sculptured, transparent or opaque; cubitus very short, pterostigma present, long but narrow, first marginal cell decidedly larger than the second; genital plate of male more or less oval in outline.

The species are of small, rather stout form and live, so far as known, exclusively on various species of *Rhus* (sumac). Our eastern species hibernate as full-grown larvæ or pupæ on the stems of their food-plants, and there is but one generation each year.\*

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\*The development of the two species occurring near Washington, D. C., was carefully studied by Mr. Theo. Pergande many years ago, and some fine drawings illustrating the various stages were made by Dr. Marx. For some reason unknown to me the box containing most of the type specimens of our species of *Calopsylla*, as well as the drawings and the manuscript referring to the descriptions of the earlier stages, could not be found after the death of Dr. C. V. Riley. Such of the figures as are still in my care are herewith published without further comment.



## TABLE OF SPECIES.

Wings rounded at tip; pterostigma long and very distinct.

Wings hyaline, shining; vertex and thorax black or brown; frontal cones decidedly longer than wide, coniform, acute at tip,

*californica*, n. sp.

Wings yellowish, transparent, moderately shining; color of body uniformly honey-yellow; frontal cones distinctly cone-shaped, longer than wide..... *flavida*, n. sp.

Wings black, not transparent, very little shining, vertex black, thorax orange-yellow; frontal processes as long as wide or broader than long..... *nigripennis* Riley

Wings distinctly angulate at tip, hyaline, with a large brown patch at basal half of anterior basal cell; vertex and thorax brown, frontal processes transverse, very short, pterostigma short and indistinct,

*triozomima*, n. sp.

The color of our species appears to be more constant than in most other Psyllids, so that it can safely be relied upon for the distinction of the species; immature specimens of *nigripennis* can readily be distinguished from *flavida* and *californica* by the form of the frontal cones.

### ***Calophya triozomima*, n. sp.**

Average length 1.9 mm. Vertex and thorax reddish brown, frontal lobes, abdomen and legs pale yellow (bright green in living specimens). Vertex smooth or obsoletely alutaceous, shining, discal impressions very large, transverse, frontal lobes reddish or reddish yellow, not, or barely visible from above, very short, transverse, broadly rounded anteriorly; antennæ stout, distinctly shorter than the width of the head, distinctly clavate, apparently 8-jointed, either uniformly pale yellow or slightly infusate at tip. Surface of thorax lighter or darker reddish brown, more or less shining, smooth or obsoletely alutaceous.

Wings about  $2\frac{1}{3}$  times longer than wide, widest at middle, distinctly acuminate and angulate at tip, smooth, perfectly transparent and colorless excepting a larger or smaller brown spot at the basal portion of anterior basal cell. Veins prominent, pale yellow, base of subcosta frequently blood-red; cubitus extremely short, fully 3 times shorter than discoidal part of subcosta, pterostigma but little conspicuous, very narrow but traceable to about the middle of radial cell, radius straight, stem of first fork as long as discoidal part of subcosta, stem of second fork more than three times longer than that of the first, greatly curved; first furcal as long as the stem, a little curved before the terminus and ending perpendicularly on the costa; second furcal more than twice longer than the first and forming a right angle therewith, at basal third straight and running toward the stem of second fork, then suddenly and nearly angularly bent and running straight toward the costa which it reaches under an oblique



angle, third furcal distinctly shorter than the fourth which is about as long as the first; tip of wing at the fourth furcal or close to it within second marginal cell; anterior basal cell as long as radial cell, discoidal cell very narrow at basal half, rapidly widening toward apex, cubital cell somewhat reniform in outline; first marginal cell nearly quadrangular, much higher than wide and at least three times larger than the second.

♂.—Genital plate longer than the genital segment, about  $2\frac{1}{2}$  times higher than broad, front and hind margins convex, tip very narrowly rounded, nearly acuminate; forceps about three times narrower than the plate and one-third shorter, very slightly curved forward, not narrowing apically, tip rounded.

♀.—Genital segment nearly as long as the rest of the abdomen, upper plate rapidly narrowing posteriorly and produced into a rather long, very acute point, upper edge rapidly descending toward the point which is straight; lower plate considerably shorter and less acute at tip than the upper plate; its lower edge nearly straight, gently ascending.

I have seen a number of specimens, partly collected by Mr.

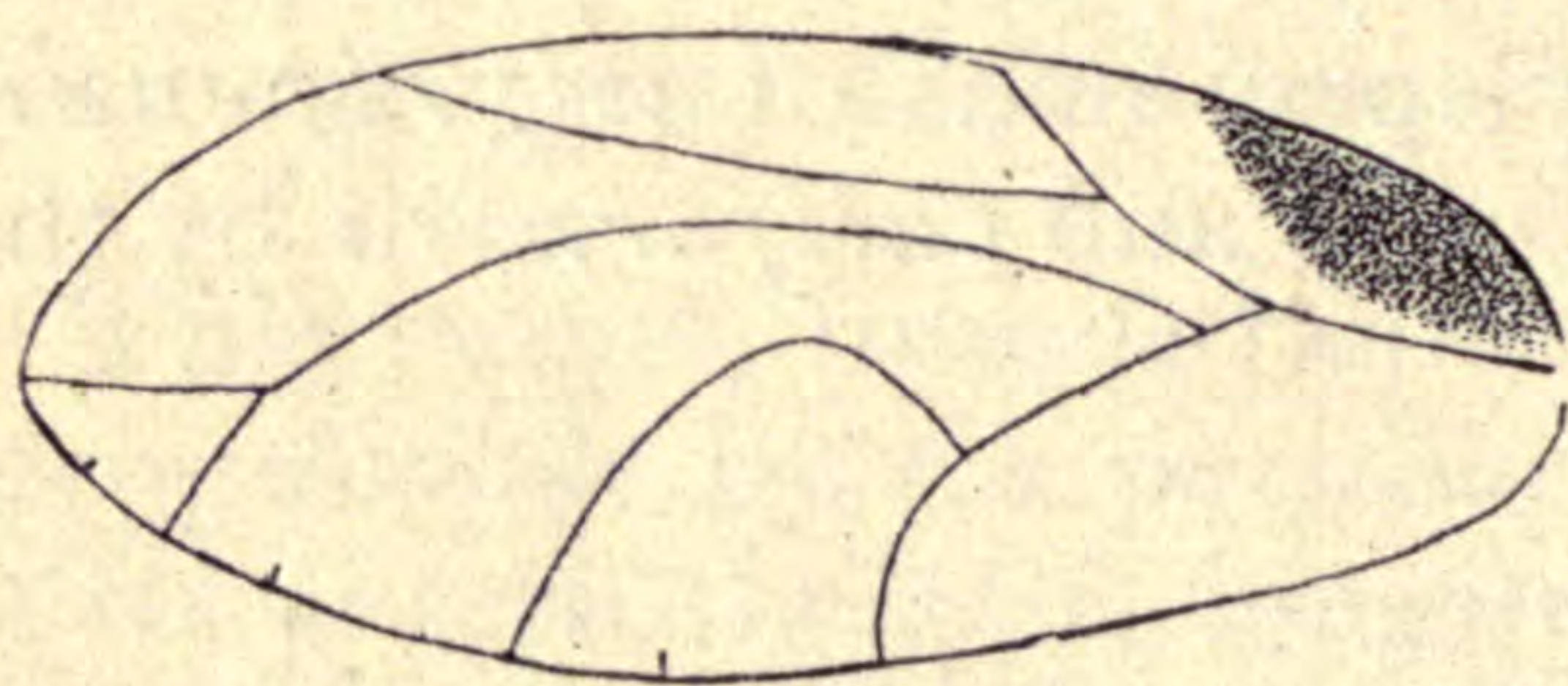


FIG. 9.—*Calophya trioanomima*.

H. K. Morrison in southern Arizona or Sonora, and partly by Mr. Coquillett in Los Angeles Co., Cal. Subsequently many specimens were found on *Rhus trilobata* in the mountains of southern Arizona by Mr. H. G. Hubbard and myself in the months of June and July.

Readily known from the other species by the form of the wings, the indistinct pterostigma and the coloration.

*Type*.—No. 8149, U. S. National Museum.

### *Calophya californica*, n. sp.

Length 1.8 mm. Vertex and thorax piceous or brownish, abdomen (excepting genital segment and anterior dorsal segments) and underside blackish; frontal cones whitish, antennæ pale yellow except at tip, legs pale yellow, femora usually with a black spot on the inner and outer sides near the tip. Vertex as in the preceding species, frontal processes decidedly cone-shaped, longer than wide at base, more or less diverging toward the tips which are rather acute; antennæ a little thinner and more slender than in the preceding, hardly as long as the width of the head, at tip decidedly black.

Wings oblong-oval,  $2\frac{1}{3}$  times longer than wide, greatest width at apical third, tip rounded, though not broadly, nearly hyaline with a tinge of milky-white, uniform in color; veins rather fine, pale yellow, differing in the following points from those of *C. trioanomima*; cubitus a little longer and only  $2\frac{1}{4}$  times shorter than discoidal part of subcosta; a very distinct and long pterostigma which is as long or longer than anterior basal cell; first furcal a little more curved, second furcal forming a slightly oblique



angle with the first, third furcal very little shorter than the fourth which runs into the tip of the wing; second marginal cell higher and larger; marginal veinlets distinct.

♂.—Genital segment pale yellow, sometimes infuscated at base, plate much larger than the segment, more broadly oval than in the preceding, with the tip more acuminate and usually blackish; forceps much lower than the plate, narrow, simple, gently curved forward, tip subacute.

♀.—Genital segment pale yellow, brownish toward tip, as long as the three preceding ventral segments together; upper plate gradually drawn out into a very acute but not very long point, upper edge straight, gradually sloping toward the tip; lower plate somewhat shorter and less acute at tip than the upper one, lower edge straight.

Numerous specimens collected by Mr. Koebele in Los Angeles Co., Cal., on *Rhus integrifolia* in the month of March. I have also seen several immature specimens from the same locality collected by Mr. D. W. Coquillett.

*Type*.—No. 8147, U. S. National Museum.

***Calophya flavida*, n. sp.**

Average length 2 mm. Color uniformly honey-yellow, legs and antennæ paler, thorax sometimes with ill-defined markings of a pale brown color and of the usual pattern. Head and thorax smooth, shining, vertex a little longer than in the following species, discal impressions variable in size, sometimes punctiform, sometimes foveiform and occupying nearly the whole width of the vertex; frontal processes distinctly cone-shaped, a little longer than wide at base, diverging toward the tip which is moderately acute; antennæ distinctly shorter than the width of the head, stout, indistinctly darker at tip.

Wings more elongate than in the preceding species,  $2\frac{1}{3}$  times longer than wide, widest beyond the middle, regularly rounded at tip, pale yellow, but little shining, tolerably transparent, absolutely punctulate; veins prominent, cubitus fully 3 times shorter than discoidal part of subcosta; stigma narrow but distinct and as long as anterior basal cell, radius straight; stem of second fork less curved than in the preceding; first furcal but slightly shorter than the stem, slightly curved, terminating rectangularly upon the costa; second furcal about  $2\frac{1}{2}$  times longer than the fourth, forming an oblique angle with the first, at basal third straight and not running toward the stem of second fork, at middle decidedly but not abruptly curved and terminating obliquely upon the costa; third furcal but little shorter than the fourth which is about equal in length to the first and runs in the tip of the wing; cubital cell much less narrowed at middle than in the preceding; first marginal cell triangular rather than quadrangular, but little higher than wide and about twice larger than second marginal cell; marginal veinlets rather obsolete.

♂.—Genital plate longer but not much larger than the genital segment, oblong-oval in shape, narrower than in the preceding species; forceps



nearly twice shorter and 3 times narrower than the plate, curved forward, tip acute, black.

♀.—Genital segment but little longer than the preceding ventral seg-

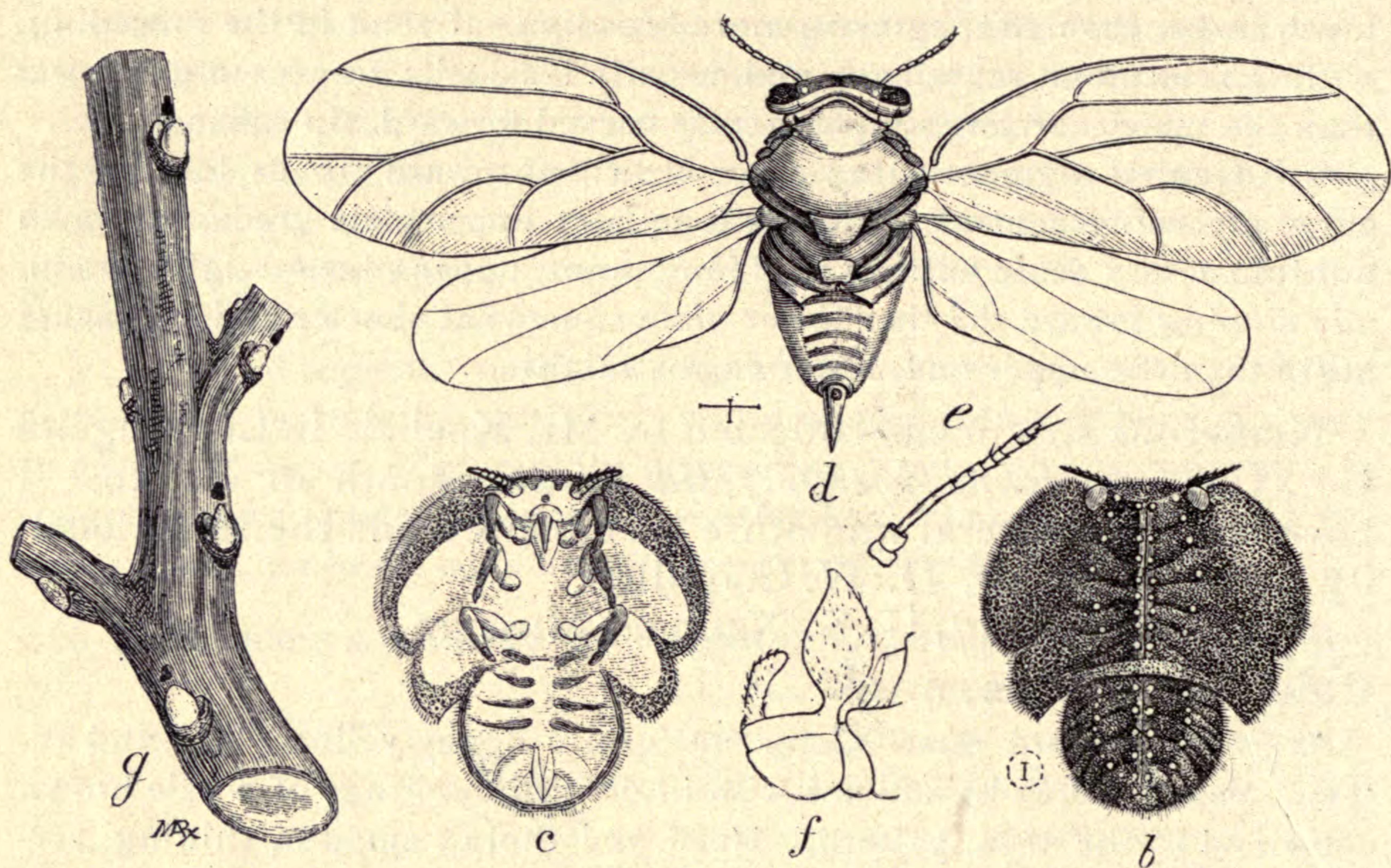


FIG. 10.—*Calophya flavida*: *b*, pupa, dorsal view; *c*, same, ventral view; *d*, ♀ imago; *e*, antenna of same; *f*, genital segment of ♂; *g*, stem of sumac with hibernating larvæ.

ment, upper plate gradually narrowed posteriorly into a short point; lower plate hardly shorter than the upper one.

This species lives exclusively on *Rhus glabra* and seems to be widely distributed; specimens are before me from Massachusetts, Washington, D. C. (collected in May), and from St. Louis, Mo.

*Type*.—No. 8148, U. S. National Museum.

***Calophya nigripennis* Riley** (*rhois* Glover, nec Fr. Loew).

Length 2 mm. Vertex, wings, and four anterior femora black, abdomen more or less infusate, frontal processes and thorax bright orange-yellow or sulphur-yellow, antennæ, except at tip, posterior femora and all tibiæ pale yellow. Head usually shining and impunctate, sometimes less or not shining and finely alutaceous; vertex distinctly shorter than in *flavipennis*, more suddenly rounded anteriorly, discal impressions small or large, frontal processes shorter than in *flavida*, cone-shaped, as long as wide at base or even a little shorter, more or less strongly divergent, obtusely pointed at tip; antennæ as in *flavida* but the tip is always decidedly black even in immature specimens.

Thorax unicolorous, rarely with faint traces of darker markings, sometimes shining and nearly smooth, sometimes hardly shining and transversely strigose.



Wings a little narrower than in *flavida* and at tip more narrowly rounded, entirely black, very little shining, not transparent, more or less distinctly punctulate; venation very similar to that in *flavida*, but the first and second furcals are decidedly shorter, the latter more gently curved, third and fourth furcals also shorter; the marginal cells are smaller, the first almost wider than high and about twice as large as the second.

♂.—Genital plate still narrower than in *flavida*, oblong, its posterior

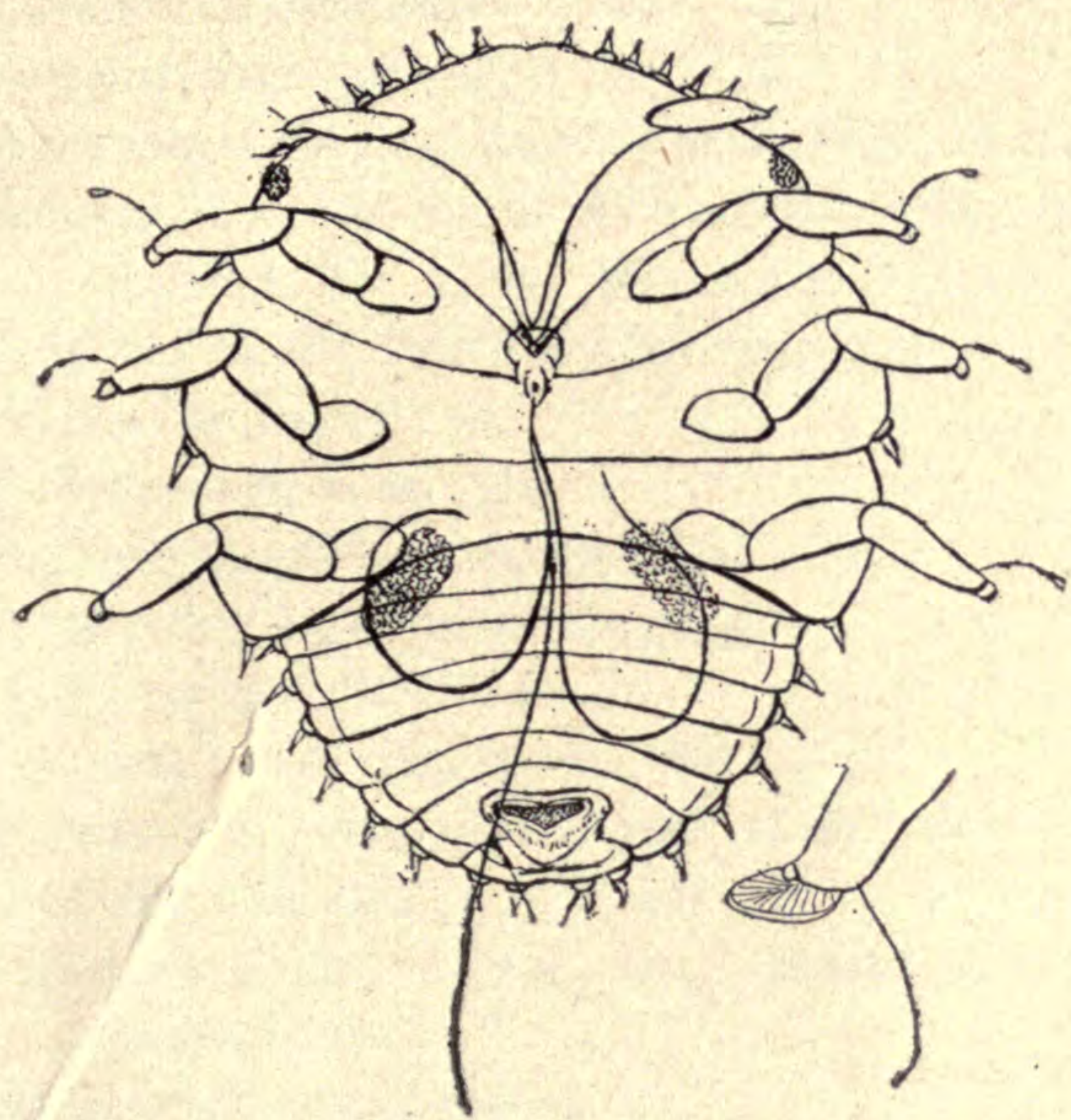


FIG. 11.—*Calophya nigripennis*: first larval stage.

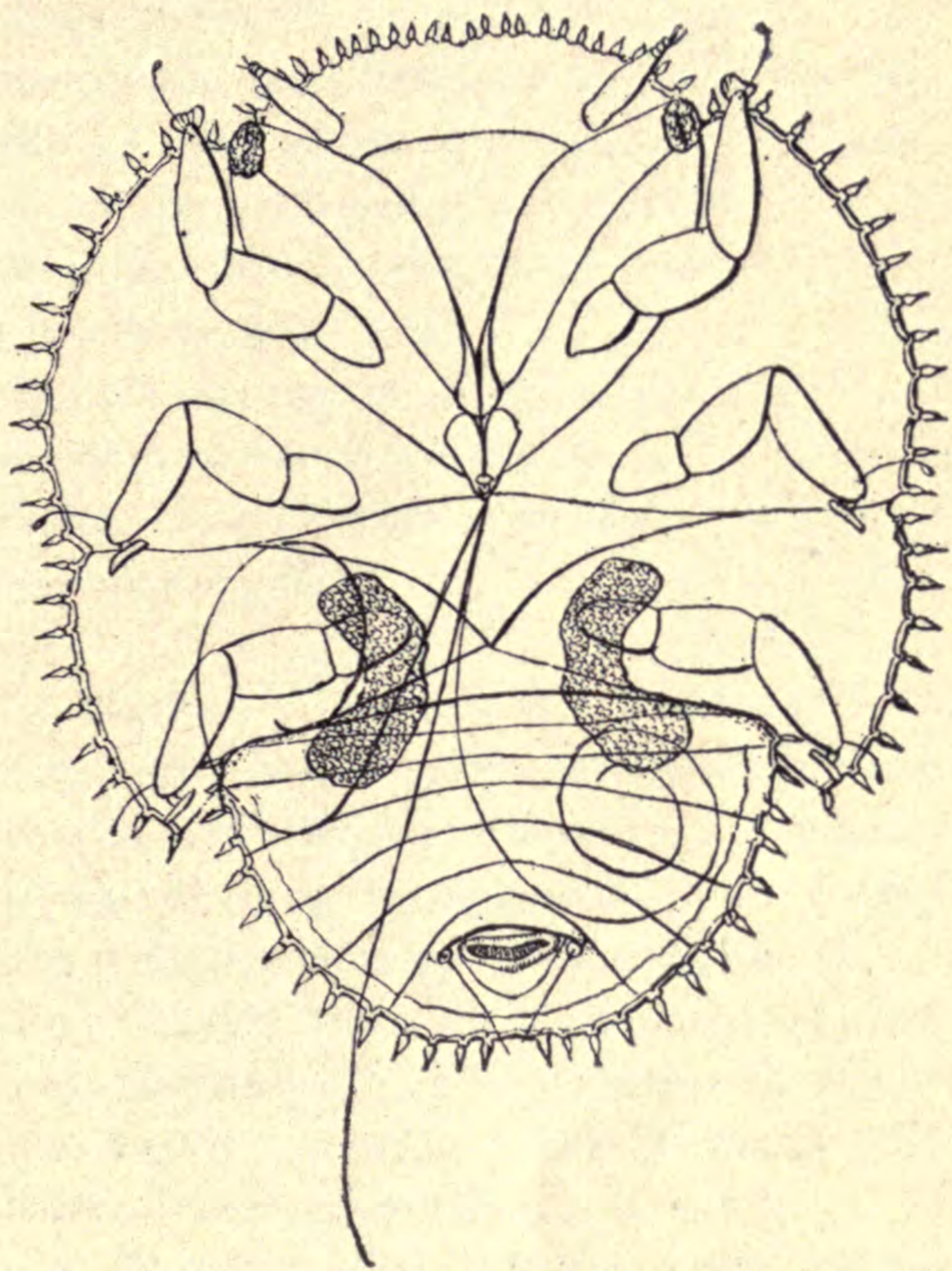


FIG. 12.—*Calophya nigripennis*: second larval stage.

edge nearly straight, anterior edge convex, tip obtusely pointed; forceps as in *flavida*.

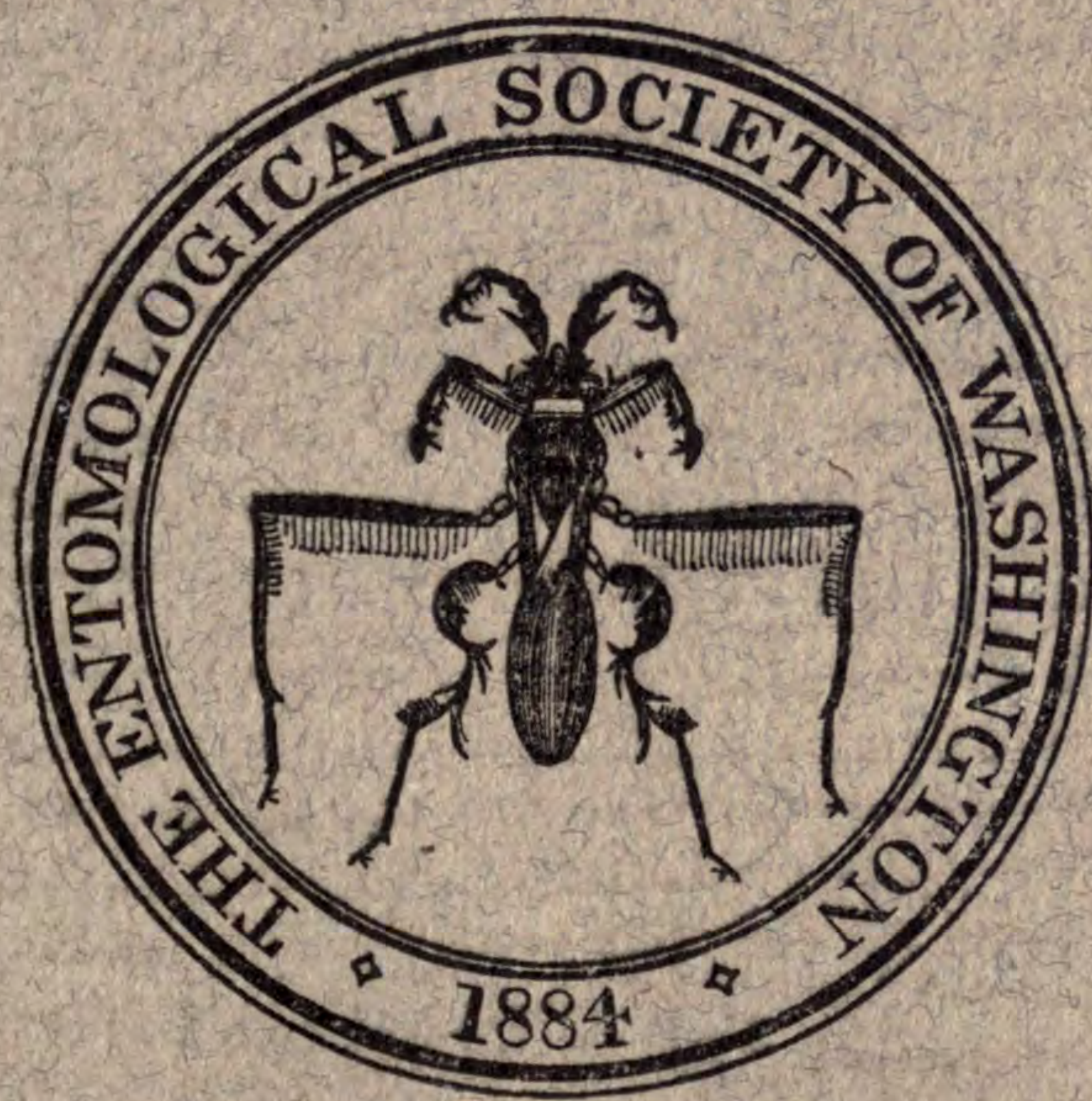
♀.—Genital segment as in *flavida* but always more or less infusate.

Lives exclusively on *Rhus copallina*. Numerous specimens are before me from Washington, D. C. (collected in May) and various parts of Georgia (collected by myself in April).

Immature specimens resemble *C. flavida* but may be distinguished by the shorter vertex, shorter frontal cones, the sexual characters of the male and by slight differences in the venation.



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