

NOTES ON NEOTROPICAL EUPTERYGINAE, WITH
A KEY TO THE VARIETIES OF ALEBRA ALBO-
STRIELLA (HOMOPTERA: JASSIDAE)

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The definition of a segregate of Eupterygine leafhoppers is made more difficult than hitherto supposed by vagaries in characters of some of the neotropical forms. The confluence of sectors or their juncture by crossveins anterior to the usual apical cells break down what has long been considered the best character for separation of a subfamily Eupteryginæ. Some of the collateral characters also have been robbed of part of their significance by the discovery of intermediate phases, so that we now seem reduced to the following relative and qualified statements for a definition of the group. Sectors of tegmen usually evanescent basally, no forks or crossveins discernible in that part of tegmen; crossveins or anastomosing of sectors usually lacking also on disk of tegmen; antepical cells rarely present; claval veins usually indistinguishable, the full complement never (?) visible; ocelli usually lacking, when present, close to eyes (less than their own diameters from front margins of eyes).

Other Jassidæ by contrast have the venation usually distinct at base of tegmen, including forks, or crossveins, or both; usually antepical cells are present, and the full complement of claval veins visible; ocelli are usually present also. The Jassidæ are otherwise distinguished from the remaining Jassoidea by the vertex not being distinctly marked off from the front by a sutural line or carina; by the ocelli, when present, being situated on the transition from crown to face, and by the lateral sutural lines (or their rudiments) bounding the frons being directed toward the ocelli or the ocellar positions.

The material reported upon in the present paper is chiefly from the collection of the United States National Museum; but numerous specimens from the University of Kansas collection and from that of the writer also have been available. Mr. J. G.

Myers was kind enough to make a special effort to collect Eupteryginæ on his trip to Cuba in the early months of 1925. Types of new species from his material will be deposited in the Museum of Comparative Zoology, Cambridge, Mass. The location of types is shown by name of the collection, or abbreviation, in parentheses after the locality records.

TRIBE ALEBRINI

Alebrini are Eupteryginæ, having an appendix to the tegmen

KEY TO THE GENERA

1. Appendix distinctly prolonged around apex of tegmen; submarginal vein distinctly within the margin of hind wing; tegmen with four apical, and no anteapical cells (Fig. 1).....*Alebra* Fieber
- Appendix not prolonged around apex of tegmen; submarginal vein on the margin of hind wing, tegmen with 4, or 3 apical cells, and sometimes with anteapical cells (Figs. 2-6).....*Protalebra* Baker

GENUS ALEBRA FIEBER

1. Vertex distinctly longer in middle than at inner border of eye..... 2
Vertex of about the same length at all points between eyes
albostriella Fallén
2. "Tegment yellowish hyaline on outer half, the inner half and entire apex deep smoky"*dorsalis* Gillette
Tegmen pale yellowish with two oblique vittæ and crossveins red; apical cells smoky with a single transparent spot in each
sanguinolinea Baker

Alebra albostriella Fallén.

C[icada] albostriella Fallén, C. F., Hemiptera Sueciae, I Cicadaria, 1826, p. 54 [Ostrogothia]. Oshanin and Van Duzee agree in dating this publication 1826. The copy or edition I have seen is dated 1829.

Examinations of the genitalia I have made indicate that there is only one species of *Alebra* with short vertex, and that common to the Old and New Worlds. I am treating the described forms, therefore, as color varieties. Venation as in Fig. 1.

Occurs throughout Europe, in Asia Minor, northern Africa, southern Canada, and the eastern United States.

KEY TO THE COLOR VARIETIES

1. Without dark markings above, other than duskiness of apical cells..... 2
- With dark markings above..... 8

2. Lacking distinct yellow or red markings, the extreme margins of tegmen sometimes tinged with yellow..... 3
With more or less pronounced yellow or red markings above..... 4
3. Apical cells hyaline or only slightly fumose.....*pallidula* Walsh
Tegmen from just anterior to crossveins to apex, solid deep smoky
tincta new variety
4. Color markings in the form of vittæ..... 5
Color markings covering tegmina..... 6
5. (Three alternatives.) Pronotum with one, tegmen with two, yellow vittæ, one along each margin.....*agresta* new variety
Pronotum with two, tegmen with two, red vittæ, the costa yellow
insigita new variety
Pronotum with two, tegmen with three, yellow vittæ
albostriella Fallén
6. Tegmen anterior to apical cells yellow to orange..... 7
Tegmen deep smoky.....*fumida* Gillette
7. Head yellow to orange.....*fulveola* Herrich-Schaeffer
Head bright red.....*rubrafrons* DeLong
8. Lacking saddle spot or crossband near middle of tegmen..... 9
With a saddle spot or crossband near middle of tegmen.....10
9. Thorax with two transverse dark dots on its anterior submargin
binotata Walsh
Disk of scutellum dusky.....*scopa* new variety
10. A distinct dusky band across middle of tegmen, and another covering apical cells.....*bicincta* DeLong
Vertex, pronotum, and scutellum with a common dusky spot, and tegmina with a saddle spot or crossband at middle
discicollis Herrich-Schaeffer

***Alebra albostriella* var. *pallidula* Walsh.**

Typhlocyba pallidula Walsh, Benj. D., Prairie Farmer, 10, No. 10, Sept. 6, 1862, p. 149 [Southern Illinois].

Alebra eburnea DeLong, D. M., Ohio Journ. Sci., 18, No. 7, May, 1918, pp. 241-242, figs. 4, c, d [Covington, Tenn.].

Common in the vicinity of Washington, D. C.; have seen specimens also from Massachusetts, New York, Illinois, Missouri, and Kansas.

***Alebra albostriella* var. *tincta* new variety.**

Pale golden yellowish, the tegmina shining, and a little deeper yellow along margins, the apex to slightly anterior to crossveins uniform smoky. Length 3 mm.

Holotype male, Douglas County, Kansas, 7. 9. 1924, P. B. Lawson (Kans. Univ.).

***Alebra albostriella* var. *agresta* new variety.**

Vertex and pronotum washed medianly with golden yellow, tegmen with a broad band of same color along each margin anterior to crossveins, the apical cells more or less fumose. Length 4 mm.

Holotype and paratype female, Odenton, Md., July 20, 1917, on *Castanea dentata* W. L. McAtee (McAtee). Other paratypes: Odenton, Md., July 4, 1913, July 12, 1914, July 14, 1918, on hickory; Beltsville, Md., Aug. 14, 1914, July 4, 1915, June 23, 1918, on *Quercus alba*; Maywood, Va., June 9, 1921; Glen-carlyn to mouth of Four-mile Run, Va., Sept. 27, 1914, W. L. McAtee (McAtee).

Douglas Co., Kans., Aug., 1923, W. Robinson; 7. 9. 1924, P. B. Lawson; Leavenworth Co., Kans., 7. 1. 24, R. H. Beamer (Kans. Univ.).

Specimens not typical enough to be made paratypes further represent the preceding localities, and also Washington, D. C., and Wyandotte County, Kans.

***Alebra albostriella* var. *albostriella* Fallén.**

Bibliographic reference same as for species.

C[icada] elegantula Zetterstedt, J. W., Fauna Insectorum Lapponica, I, 1828, p. 536 [Lapponica].

T[yphlocyba] eximia Hardy, James, Trans. Tyneside Naturalists' Field Club, I, 1850, p. 417 [Derwent River, England].

Does not seem to be so common in this country as either vars. *agresta* or *fulveola*; specimens at hand were collected at Washington, D. C.; Odenton, Md., and Four-mile Run, Va. (McAtee).

***Alebra albostriella* var. *insignita* new variety.**

Vertex, pronotum, and scutellum with two broad vittæ, showing some tendency to fuse, clavus except narrow outer margin, and broad vitta from near base of tegmen to crossveins exterior to claval suture, bright red; costa broadly yellow; apical cells and spots anterior to crossveins smoky. Length, 4.5 mm.

Holotype, Palmord Green, England, Oct. 29, 1915. E. A. Butler (McAtee).

***Alebra albostriella* var. *fulveola* Herrich-Schaeffer.**

Typhlocyba fulveola Herrich-Schaeffer, G. A. W., Faunae Insectorum Germaniae, No. 165, 16, 1839. This reference not personally verified.

Typhlocyba aurea Walsh, Benj. D., Prairie Farmer, 10, No. 10, Sept. 6, 1862, p. 149 [Rock Island, Ill.].

Alebra flavocephala Kupka, Ent. Nachr., 25, Nos. 3-4, Feb., 1899, pp. 33-34 [Halle, Germany].

Specimens are at hand from New York, Maryland, District of Columbia, Virginia, Illinois, Minnesota, and Kansas.

***Alebra albostriella* var. *rubrafrons* DeLong.**

Alebra albostriella var. *rubrafrons* DeLong, D. M., Ohio Journ. Sci., 18, No. 7, May, 1918, p. 240 [Clarksville, Tenn.].

Apparently not otherwise recorded.

***Alebra albostriella* var. *fumida* Gillette.**

Alebra fumida Gillette, C. P., Proc. U. S. Nat. Mus., 20, 1898, pp. 714-715, figs. 10-12 [Ithaca, N. Y.].

Specimens are at hand from Minnesota and Kansas; it has been recorded also from Tennessee.

***Alebra albostriella* var. *binotata* Walsh.**

Typhlocyba binotata Walsh, Benj. D., Prairie Farmer, 10, No. 10, Sept. 6, 1862, p. 149 [Rock Island, Ill.].

This form like others of Walsh's species with the "elytra bordered by a vein on the inner terminal margin" is ranged under *Alebra albostriella*. However, it has not been rediscovered and its exact identity is in doubt.

***Alebra albostriella* var. *scopa* new variety.**

Shining stramineous with pale golden reflections, a quadrate blackish spot on base of disk of scutellum. Length, 4 mm.

Holotype female, Leavenworth County, Kans., June 30, 1924, R. H. Beamer (Kans. Univ.).

***Alebra albostriella* var. *bicincta* DeLong.**

Alebra bicincta DeLong, D. M., Ohio Journ. Sci., 18, No. 7, pp. 240-241, figs. 4a, b [Clarksville, Tenn.].

Coloration as in var. *agresta*, overlaid by two broad dusky crossbands, one just back of apex of scutellum, the other covering apical cells and a narrow area anterior to crossveins. May be a distinct species but no male is available for examination of the genitalia. A specimen from DuBois, Ill., Aug. 9, 1917, is one of

several collected by J. R. Malloch. One examined also from Raravis, Miss., July 5, 1921, Carl J. Drake.

***Alebra albostriella* var. *discicollis* Herrich-Schaeffer.**

Typhlocyba discicollis Herrich-Schaeffer, G. A. W., Faunae Insectorum Germaniae, No. 124, 8, date?. This work not available; but the date is prior to that of the following.

Typhlocyba (Cicadula Zett.) *wahlbergi* Boheman, Carl H., Öfv. Kgl. Vet.-Akad. Forh. 2, No. 6, 1845, p. 160 [Sweden].

Specimens at hand are from Falls Church, Va. (June 9, N. Banks), and Washington, D. C. In June of both 1924 and 1925, some Japanese maples in Washington parks, heavily infested with the species, yielded a considerable proportion of this variety, which rarely was seen on other trees attacked.

If *Eupteryx fasciata* Curtis (British Entomology, 14, 1837, Fasc. 640 [p. 2]) is assignable as a variety of *Alebra albostriella* its position would be near *discicollis* to which it would bear the same relation as var. *insignita* does to var. *albostriella*. However, the reference is doubtful as *E. fasciata* is placed by Curtis in a group with the "face elongated," not a good description of *albostriella*.

***Alebra dorsalis* Gillette.**

Alebra dorsalis Gillette, C. P., Proc. U. S. Nat. Mus., 20, 1898, p. 713 [Chapada, Brazil].

The type seen (U. S. N. M.).

Species not seen.

Alebra sanguinolinea Baker, C. F., Invertebrata Pacifica, 1, pp. 5-6, Sept. 15, 1903 [San Marcos, Nicaragua].

Alebra terminalis Osborn, H., Ann. Carnegie Museum, 15, No. 4, Aug., 1924, p. 451 [Province del Sara, Bolivia].

GENUS PROTALEBRA BAKER

KEY TO THE SUBGENERA

1. Sectors of tegmen straight, traversing the color pattern, apical cells four, antepical cells none (Fig. 2); venation of wing much as in *Alebra* (Fig. 1) *Protalebra* Baker
- Sectors of tegmen more or less curved conforming to the color pattern2

- 2. Four apical* and one or two antepical cells present.....3
 Less than four apical, and no antepical cells present.....4
- 3. With two antepical cells, one formed by confluence of first and second sectors, the other by a distinct crossvein between second and third sectors; marginal vein of hind wing lacking a fork near middle of radial margin (Fig. 3).....*Plagalebra* new subgenus
 With a single nearly or entirely closed antepical cell formed by convergence or confluence of first and second sectors (Fig. 4); marginal vein of hind wing with a fork near middle or radial margin, as in *Alebra* (Fig. 1) and in fact all the other subgenera here keyed
Paralebra new subgenus
- 4. Reduction to three antepical cells due to incompleteness of first (costal) cell; first sector indistinguishable, second and third united in a stalk anterior to crossveins (Fig. 6).....*Aphanalebra* new subgenus
 Reduction to three antepical cells apparently due to suppression of second; all sectors traceable, no stalk anterior to crossveins (Fig. 5)
Kallebra new subgenus

SUBGENUS PROTALEBRA BAKER

- 1. Fourth apical cell broader at base than elsewhere, its costad margin introrsely angulate, the cell stubbily L-shaped, inclosing at the angle a conspicuous black dot; a larger black spot in first apical cell; corium with 4 dark lines which converge posteriorly
octolineata Baker
 Fourth apical cell narrow at base, its costad margin extrorsely angulate2
- 2. Principal color marking of tegmen a pale vitta which runs from middle of clavus to costa and thence posteriorly and inwardly to base of fourth apical cell.....3
 Lacking such a vitta.....4
- 3. Pronotum yellowish anteriorly, whitish posteriorly, curved pale vitta of tegmen reaching radial margin at apex of clavus, and sending a branch to second apical cell.....*curvilinea* Gillette
 Pronotum chiefly whitish, yellowish spotting on disk and reddish edging laterally; curved pale vitta terminating at inner part of base of fourth apical cell.....*vexillifera* Baker
- 4. Tegmen with its chief markings essentially transverse.....5
 Tegmen with its chief markings otherwise.....6
- 5. Tegmen with a broad dusky band at base, and another over crossveins
bifasciata Gillette
 Tegmen with four deeply wavy transverse yellow lines.....*terminata* Baker
- 6. Color pattern of tegmen consisting chiefly of spots along radial margin, the costal side mostly clear.....7

* Crossvein forming base of first or costal apical cell occasionally is obsolete, apparently in any of the Eupteryginae.

- Color pattern otherwise.....8
7. A dark dot on middle of radial margin and one at apex of clavus; another just exterior to latter on corium, and a faint dusky band across apical cells.....*trimaculata* Gillette
Clavus with a large reddish, and corium with two yellowish, blotches near radial margin; apical cells chiefly dusky; scutellum dark subapically, white apically; a dark dot near base of tegmen
amoena Baker
8. Pronotum, scutellum, and apical cells chiefly dusky with whitish or hyaline spots, clavus with a curved longitudinal vitta bordering radial margin, and corium with a broad oblique band from costal plaque tapering near base of fourth apical cell, dusky, similarly interrupted by clear spots.....*brasiliensis* Baker
Coloration otherwise.....9
9. Tegmen dusky with orange-red costal region, a similarly colored oblique mark on clavus, and one on corium just exterior to it; narrow whitish crossband on fourth crossvein, and another across apical cell
robusta Gillette
Tegmen whitish with oblique golden-yellow vittæ on basal half and a lemon-yellow one bordered with dusky across apical cells
nexa new species

Protalebra (Protalebra) octolineata Baker.

Protalebra octolineata Baker, C. F., Invertebrata Pacifica, 1, p. 7, Sept. 15, 1903 [Nicaragua; Guatemala].

Outer claspers of male with numerous long pale bristles, especially basally. Specimens are at hand from: Grenada, H. H. Smith; La Ceiba, Honduras, F. J. Dyer, and Ancon, Canal Zone, May 12, 1911, A. H. Jennings (U. S. N. M.). The latter specimens (somewhat damaged) may represent another species, but for the present it may be placed as a variety of *Protalebra octolineata*, namely, var. *signata* n. var. The costal dark stripe is lacking in this form, the costal section of tegmen is pale brownish yellow; the part between the pair of discal stripes is white, as is also the costa apically and the top of head and pronotum; the lateral color vittæ on pronotum are orange red, the median one dusky. Van Duzee records this species from Jamaica.

Protalebra (Protalebra) curvilinea Gillette.

Alebra curvilinea Gillette, C. P., Proc. U. S. Nat. Mus., 20, 1898, pp. 710-711, fig. 1 [Chapada, Brazil].

The original specimens have been examined; the outer claspers of male and ovipositor sheaths of female each have a row of sev-

eral bristles, two of which in the middle are dark, the others pale.

Protalebra (Protalebra) vexillifera Baker.

Protalebra vexillifera Baker, C. F., Psyche, 8, p. 404, Sept., 1899 [Chapada, Brazil].

One female and two males from the type material. The outer claspers and ovipositor sheaths each have a row of pale bristles.

Protalebra (Protalebra) bifasciata Gillette.

Alebra bifasciata Gillette, C. P., Proc. U. S. Nat. Mus., 20, 1898, p. 711, fig. 2 [Chapada, Brazil].

One female and three males from the type material. The cross-bands in all cases complete medianly, may or may not reach the costal margin of tegmen. Bristles of genitalia as in *P. vexillifera*. Van Duzee records this species from Jamaica, and I have seen a specimen collected at Juana Diaz, Porto Rico, Feb. 11, 1925, by H. L. Dozier.

Protalebra (Protalebra) terminata Baker.

Protalebra terminata Baker, C. F., Psyche, 8, p. 404, Sept., 1899 [Chapada, Brazil].

All of the original material is extant; genitalia with pale bristles.

Protalebra (Protalebra) trimaculata Gillette.

Alebra trimaculata Gillette, C. P., Proc. U. S. Nat. Mus., 20, 1898, p. 711, figs. 3-4 [Chapada, Brazil].

The holotype female examined; ovipositor sheaths each with a row of pale bristles.

Protalebra (Protalebra) amoena Baker.

Protalebra amoena Baker, C. F., Psyche, 8, pp. 404-405, Sept., 1899 [Chapada, Brazil].

The holotype male examined; genitalic bristles pale.

Protalebra (Protalebra) brasiliensis Baker.

Protalebra brasiliensis Baker, C. F. Psyche, 8, p. 405 [Chapada and Corumba, Brazil].

Genitalic bristles pale in both sexes; venation of tegmen as in Fig. 2; numerous specimens available from the type material.

Existing information indicates that this is the most common and widespread species of the genus. Specimens at hand, other than the Brazilian types are from Rurrenabaque, Bolivia, W. M. Mann; Honduras, F. J. Dyer; Sinaloa, Mex., J. A. Kusche; Trinidad, Aug. Busek; Grenada and St. Vincent, H. H. Smith; St. Thomas, Harold Morrison; Porto Rico, Aug. Busek, R. T. Cotton, G. N. Wolcott; Brownsville, Tex., Nov. 30, 1910, C. A. Hart; Little River, Fla., Dec. 1, 1912, F. Knab; Jacksonville, Fla., W. H. Ashmead; Gainesville, Fla., Aug. 25, 1918, J. R. Watson. The species is recorded from Jamaica also by Van Duzee.

Protalebra (Protalebra) robusta Gillette.

Alebra robusta Gillette, C. P., Proc. U. S. Nat. Mus., 20, 1898, pp. 712-713, figs. 5-6 [Chapada, Brazil].

Besides the male holotype, two females from the type locality are available. The genitalic bristles are in more than one row, and a group of several of them in middle of series are black; the posterior margin of the side of ninth segment in the male also bears several strong posteriorly directed pale bristles.

Protalebra (Protalebra) nexa new species.

General color stramineous, vertex with a yellowish discal blotch; pronotum with a marking following anterior margin, and emitting three broad posterior projections, golden-yellow; clavus with base and c-shaped median mark, golden-yellow, and the apex orange-red; corium with two oblique, irregular golden-yellow vittæ originating anterior to costal plaque and joining about middle of claval suture; an oblique pale lemon-yellow vitta begins at hind margin of costal plaque and runs to crossveins, where it joins another of irregular shape that extends from apex of clavus to exterior apical angle of tegmen; these vittæ are bordered almost throughout by dusky to black lines. Underparts stramineous; genitalic bristles pale; eighth sternite of female almost evenly convex posteriorly. Length: 2.75-3 mm.

Described from three females, Signal Hill, St. Thomas, Virgin Islands, June 1, 1917, Harold Morrison; a teneral female from St. Thomas, June 5, also seen (U. S. N. M.).

Subgenus **Plagalebra** new subgenus.

Essential characters expressed in key and in Fig. 3. Subgenotype *Protalebra singularis* Baker.

Protalebra (Plagalebra) singularis Baker.

Protalebra singularis Baker, C. F., Psyche, 8, pp. 402-403, Sept., 1899 [Chapada, Brazil].

The original material available; the male genitalia are peculiar in that the outer claspers do not extend to apex of ninth segment, the latter being greatly enlarged; claspers with a row of strong pale bristles. The ovipositor sheaths are similarly armed; eighth sternite of female moderately emarginate laterally, and slightly angulate medianly.

Subgenus **Paralebra** new subgenus.

Based on the characters mentioned in key and illustrated in Figure 4. Subgenotype *Protalebra similis* Baker.

KEY TO THE SPECIES

Color pattern consisting chiefly of longitudinal vittæ, the dorsum crossed by two pale lunes.....*similis* Baker
 Color pattern composed of rather large yellowish or hyaline spots
pardalis new species

Protalebra (Paralebra) similis Baker.

Protalebra similis Baker, C. F., Psyche, 8, p. 403, Sept., 1899 [Corumba, Brazil].

The original material is extant, but one specimen is now represented by only a single tegmen. Male claspers extending about to apex of ninth segment which is moderately large. In a female from Chapada, Brazil, the eighth sternite is almost straight across the hind margin; ovipositor sheaths each with a row of long pale bristles. Venation of tegmen as in Fig. 4. Specimens of this species are at hand also from Panama, Honduras, Porto Rico, Grenada, and St. Vincent.

Protalebra (Paralebra) pardalis new species.

General color, shining black, marked with the following white to yellow spots; three in a row across anterior part of vertex, the median one largest, more or less diamond-shaped, and sometimes connected with the others; two on posterior margin of vertex next the eyes; a median wedged-shaped one, anterior margin of pronotum, and three across disk, of which the lateral ones are larger, and approximately circular, and the median one small and lunate (lateral and posterior margins of pronotum narrowly whitish); scutellum beyond transverse impression, two small spots basad

of that marking, and sometimes two near basal angles; clavus with two large roundish spots basally and a pair of more or less oblong ones at middle, and a triangular one covering apex; corium with two larger spots basally along clavus, two smaller ones near costa, a small speck about middle along clavus, and four larger spots anterior to the crossveins; the outer one of these, the first apical cell, and the partially closed cell of corium are more or less hyaline, and the veins bordering them are yellow. Clypeus and lower margins of face whitish, also a band across upper part of front, with extensions at the sides to antennal insertions. Legs chiefly whitish, male claspers and female ovipositor sheaths, each with a row of pale bristles; eighth sternite of female very moderately emarginate laterally and slightly angulate medianly. Length: 2.5-3 mm.

Holotype male, allotype and several paratypes from La Ceiba, Honduras, August to December, F. J. Dyer; also a female from Hot Springs, Ariz., June 25, E. A. Schwarz and H. S. Barber (U. S. N. M.).

This may be the same as *Protalebra maculata* Baker, but I cannot be certain of it from the description alone.

Subgenus **Kallebra** new species.

Characters as outlined in key and illustrated in Fig. 5. Subgenotype *Protalebra ninettae* Baker.

Protalebra ninettae Baker, C. F., Psyche, 8, p. 403, Sept., 1899 [Chapada, Brazil].

The holotype male is the only specimen seen; the outer claspers lack the bristles so characteristic of most species of Alebrini. (Possibly rubbed off.) Venation of tegmen as in Fig. 5.

Subgenus **Aphanalebra** new subgenus.

Characters as shown in the key and in Fig. 6. Subgenotype *Protalebra unipuncta* Baker.

Protalebra (Aphanalebra) unipuncta Baker.

Protalebra unipuncta Baker, C. F., Psyche, 8, p. 404, Sept., 1899 [Chapada, Brazil].

The four specimens mentioned in the original description, and one other from Chapada are available. The outer claspers of male and ovipositor sheaths of female each have a row of long pale bristles. Venation of tegmen as in Fig. 6.

Species not seen.

Protalebra nicaraguensis Baker, C. F., Invert. Pacif., 1, p. 6, Sept., 1903 [San Marcos, Nicaragua].

Protalebra transversalis Baker, C. F., Invert. Pacif., 1, p. 6, Sept., 1903 [Acapulco, Mexico].

Protalebra maculata Baker, C. F., Invert. Pacif., 1, pp. 6-7, Sept., 1903 [San Marcos, and Managua, Nicaragua]. See note under *Protalebra pardalis*, p. 151.

Protalebra apicalis Van Duzee, E. P., Bul. Buffalo Soc. Nat. Sci., 8, 1907, p. 74 [Mandeville, Jamaica]. Is this a *Protalebra*?; the distinct ocelli indicate need of close scrutiny.

Protalebra omega, Van Duzee, E. P., Bull. Buffalo Soc. Nat. Sci., 8, 1907, p. 75 [Rock Fort, Jamaica].

Alebra aureovittatus DeLong, D. M., Journ. Dept. Agr. Porto Rico, 7, No. 1 (Jan., 1923), Jan., 1924, pp. 267-269, Pl. 2, figs. 3a, 3b [Porto Rico]. Seems to be a *Protalebra*.

Protalebra scriptozona Van Duzee, E. P., Proc. Calif. Acad. Sci., 12, No. 11, June, 1923, pp. 186-187 [Ceralbo Island, Gulf of California].

TRIBE DIKRANEURINI

Dikraneurini are Eupteryginæ which lack an appendix to the tegmen but possess a submarginal vein closing all the apical cells in the wing.

KEY TO THE GENERA

1. Submarginal vein joining costal margin of wing, not bounding outermost closed apical cell (Figs. 7, 12, 13, 15, 16).....2
 Submarginal vein of wing bounding the outermost closed apical cell (Fig. 10).....4
2. With 2 closed apical cells in wing.....3
 With one closed cell in wing (Fig. 16).....*Typhlocybella* Baker
3. Third apical vein of tegmen curving to radial margin, sectors convergent at one or more points, or with stump veins, or united by crossveins (Figs. 7-9).....*Parallaxis* new genus
 Third apical vein of tegmen more or less paralleling radial margin, ending in apical margin; sectors neither convergent nor united (Figs. 11-15).....*Dikraneura* Hardy
4. With 3 apical cells in wing (Fig. 10).....*Eualebra* Baker
 With one apical cell in wing.....*Empoasca* Walsh*

* *Empoasca*, a cosmopolitan genus with numerous neotropical species, is not reported upon here as time does not suffice for revising it even by the somewhat incomplete method here applied to the other genera.

Genus **Parallaxis** new genus

Venation of wing as in *Dikraneura* s. s. (Fig. 12). Venation of tegmen characterized by tortuosity of both sectors and apical veins. I have used the curvature of third apical vein to the radial margin as a leading generic character because the same feature has proved reliable in the genus *Typhlocyba*. The first apical vein curves to the costal margin but not so much stress is laid upon this feature because of its known variability not only in *Typhlocyba* but also in the more closely related genus *Dikraneura*. Sectors convergent, or nearly or quite united as described in key and figure (Figs. 7-9).

Genotype *Parallaxis vacillans* new species.

KEY TO THE SPECIES

1. Vertex little if any longer at middle than at inner margin of eye.....2
 Vertex distinctly longer at middle than at inner margin of eye.....3
2. Sectors 1 and 2 convergent, but without stump veins (Fig. 7)
 vacillans new species
 Sectors 1 and 2, and 2 and 3 convergent, with more or less developed
 stump veins (Fig. 9).....*tessellata* new species
3. Sectors 1 and 2, and 2 and 3 convergent, sometimes nearly connected
 by stump veins.....*respersa* new species
 Sectors 1 and 2, and 2 and 3 connected by crossveins forming two dis-
 tinct anteapical cells (Fig. 8).....*clathrata* new species

Parallaxis vacillans new species.

Head, anterior border of pronotum, and scutellum, yellowish; face with short dark bars on the sides below, a double parentheses-like pale marking above, the upper part of which it outlined by darker, a line on middle of vertex, forking on upper border of face, also dark. Pronotum except anterior border and most of tegmina old gold with a flocculated appearance; three small triangles along inner margin of clavus whitish; areas anterior and posterior to crossveins hyaline, apical cells otherwise fumose. Venter yellow, legs testaceous. Outer claspers of male and ovipositor sheaths of female each with a row of pale bristles; eighth sternite of female evenly convex posteriorly. Venation of tegmen and wing as in Fig. 7. Length, 3-3.5 mm.

Holotype male, allotype female, and numerous paratypes from Chapada, Brazil, January, March, April, May; Corumba, Brazil, April, May; La Ceiba, Honduras, F. J. Dyer; Millan, Vera Cruz, Mexico, Jan. 2, 1908, F. Knab (U. S. N. M.).

Parallaxis tessellata new species.

KEY TO THE COLOR VARIETIES

1. Clavus with few pale spots.....var. *beata* new variety
 Clavus with numerous pale spots.....2

2. Costal plaque and posterior parts of costal region chiefly whitish; general coloration stramineous.....var. *mendica* new variety
 Costal plaque yellow, first apical cell dusky; general coloration
 olivaceous var. *tessellata* new variety

Parallaxis tessellata var. *tessellata* new variety.

Ground color of head and thorax pale yellow, marked with olivaceous as follows: two dense triangles on disk of vertex, a small more diffuse elongate mark between each triangle and one eye, a faint lune on posterior margin of vertex each side of the short blackish median line; a broad band across pronotum, bordered and medianly interrupted by whitish, two dots near median line anteriorly, and a large transverse comma-like marking each side of them; two dense dots on anterior disk of scutellum, and all angles of this sclerite. Clavus and adjacent corium whitish hyaline, deeply washed with olivaceous which is interrupted by numerous yellow dots and blotches; costal plaque yellowish, bordered at both ends by dusky and anteriorly by a nearly orange blotch; region from posterior end of costal plaque to crossveins and including first and fourth apical cells dusky, the veins bright yellow, the interior of cells in front of crossveins more or less hyaline; apical cells 2 and 3 nearly hyaline traversed by a row of small dark blotches paralleling apical margin. Upper part of face olivaceous with transverse pale markings, cheeks and clypeus brownish; abdomen fuscous with pale edgings; ovipositor sheaths each with a row of pale bristles; eighth sternite of female nearly transverse apically, its lateral angles truncate. Venation of tegmen as in Fig. 9; of hind wing as in *P. vacillans*. Length, 3-3.25 mm.

Holotype and one other female, Chapada, Brazil, April. Another specimen, scarcely typical, from Corumba, Brazil (U. S. N. M.).

Parallaxis tessellata var. *mendica* new variety.

Ground color stramineous, markings chiefly as in var. *tessellata* but drab instead of olivaceous; costal plaque, costa posterior to it, and area between 1st and 2nd sectors whitish; apical cells more extensively whitish or hyaline, the veins pale yellow; underparts stramineous, with scanty drab edgings, ares, etc. Length, 3 mm.

Holotype female, Rio de Janeiro, Brazil (U. S. N. M.).

Parallaxis tessellata var. *beata* new variety.

Ground color of head and thorax brighter yellow and all markings more pronounced than in var. *tessellata*; basal triangles of scutellum reddish. Band across pronotum fumose; clavus dusky fumose, only inner anterior margin, and a very few spots pale; tegmen otherwise of the same color and with hyaline areas about as in var. *tessellata*. Male claspers with a promi-

ment elliptical opening between them at base, strap-like, turned edgewise, with a fringe of long pale bristles on upper margin. Length, 3 mm.

Holotype male, Chapada, Brazil, April (U. S. N. M.).

Parallaxis respersa new species.

KEY TO THE COLOR VARIETIES

1. A dark bar across pronotum near posterior margin; larger color spots on clavus and corium bright sanguineous.....var. *respersa* new variety
- No dark bar on pronotum; large color spots on clavus and corium pale orange.....var. *decrepita* new variety

Parallaxis respersa var. **respersa** new variety.

Ground color of head and thorax ivory white; vertex with a heavy, broadly V-shaped black marking on disk which is connected with the usual median black line and with fainter arc on each side anteriorly; posterior two-thirds of pronotum overlaid by reddish orange, across which is a transverse blackish vitta broader medianly, and interrupted there by a pale mark which extends toward anterior margin of pronotum, the latter pale edge ornamented with dark marks as follows: a median dot, with a transverse comma, and beyond that a V on each side. Scutellum yellowish, the basal angles reddish, with an interrupted subapical dark band. Corium and clavus chiefly whitish hyaline, each ornamented by two large bright sanguineous spots with dusky edgings; costal plaque whitish, overlaid by yellow and speckled with black; costa posterior to it orange-reddish; crossveins and apical veins bright yellow, adjacent membrane hyaline with dusky spots and edgings, first apical cell solidly dusky. Upper part of face yellowish with faint arcs, cheeks and clypeus blackish; abdomen fuscous; eighth sternite moderately convex apically; bristles of ovipositor sheath pale. Venation much as in *P. tessellata* (Fig. 9), the stump veins more nearly anastomosing. Length, 3 mm.

Holotype female, Chapada, Brazil, April (U. S. N. M.).

Parallaxis respersa var. **decrepita** new variety.

Ground color of head and thorax yellowish, the markings much as in var. *respersa* but smaller and olivaceous instead of blackish. Posterior two-thirds of pronotum washed with olivaceous, paler medianly and without a transverse dark band as in var. *respersa*. Large color spots on tegmen pale orange, less distinctly margined with dusky than in the other variety; costal plaque not distinctly speckled; hyaline areas of tegmen larger. Length, 2.75 mm.

Holotype female, Corumba, Brazil, May (U. S. N. M.).

Parallaxis clathrata new species.

Vertex ivory white anteriorly, washed with yellowish posteriorly, with several faint dusky traces, and two bolder sagittate dark markings in middle. Pronotum broadly margined anteriorly with yellow upon which are small dark markings; posterior two-thirds deep olivaceous. Scutellum with the basal triangles olivaceous, sometimes interrupted subapically by yellowish; otherwise yellowish more or less washed or spotted with olivaceous. Tegmen anteriorly and the veins posteriorly, chiefly yellow, a dark olivaceous or blackish blotch anterior to and posterior to costal plaque; three deeper yellow areas on clavus, and two on adjacent corium, outlined by dusky; apical portions of areas between sectors, antepical and apical cells (except 1 and 4 which are solidly dusky), hyaline, more or less heavily margined with dusky. Venation of tegmen as in Fig. 8; of wing as in *P. vacillans* (Fig. 7). Face fuscous below, yellowish to olivaceous above, with a pair of pale markings above and between antennal insertions, and a pair of dark dots near upper margin. Abdomen fuscous with pale edgings. Male claspers with a few pale bristles, eighth sternite of female convex almost subangulate medianly; ovipositor sheaths with numerous strong pale bristles. Length, 2.25-2.75 mm.

Holotype male, La Ceiba, Honduras, Oct. 22, 1916, F. J. Dyer; allotype female, Paraiso, Canal Zone, Panama, Feb. 7, 1911; paratypes, latter locality, Feb. 8, 1911; Tabernilla, Canal Zone, Feb. 6, 1911, Aug. Busek; other specimens, La Ceiba, Honduras, F. J. Dyer; Ancon, Canal Zone, May 12, 1911, at light, A. H. Jennings (U. S. N. M.).

Genus *Eualebra* Baker.***Eualebra smithii* Baker.**

Eualebra smithii Baker, C. F., Psyche, Vol. 8, p. 402, Sept., 1899 [Chapada, Brazil].

The figures (10) of venation are made from the type. Baker suggests that the face of this specimen had collapsed in drying. While this may be true to a certain extent, it is the writer's impression that *Eualebra* is a notably depressed form somewhat similar to the subgenus *Hyloidea* described on page 162. Van Duzee made a similar remark about the species he described.

Species not seen.

Eualebra notata Baker, C. F., Invertebrata Pacifica, 1, p. 7, Sept., 1903 [Champerico, Guatemala].

Eualebra rubra Van Duzee, E. P., Bul. Buffalo Soc. Nat. Sci., 8, 1907, pp. 73-74 [Kingston, Jamaica].

Genus *Dikraneura* Hardy

Ball and DeLong have recently described* 5 new species of this group and given useful keys embracing 19 species. They have adopted a method of numbering the apical cells that is the opposite of the usual practice of beginning at the costal side, and is correspondingly confusing. They have depended entirely on the stalking of the second (their third) apical cell for separating a group *Alconeura* as a new genus. This character is too variable to serve as the basis of so trenchant a separation hence *Alconeura* is here treated as a subgenus. The stalking of this cell is not the main dependence, as these authors state, for distinguishing the genus *Typhlocyba* from *Erythroneura*; in fact the writer has found it so variable that he has not felt justified in making any use of it, not even for the definition of species.

The figures illustrating venation in the paper referred to are carelessly drawn in a number of instances. In general the sectors are drawn as if visible to the base of tegmen, while a leading characteristic of the subfamily Eupteryginae is that the sectors usually are not visible basally. No fewer than six different styles of fusion of these veins basally are shown; a state of affairs which if actually exhibited by the specimens would compel their distribution to widely separated taxonomic groups.

KEY TO THE SUBGENERA

1. Second apical cell scarcely angulated or stalked at base.....2
 Second apical cell usually angulated or stalked at base.....3
2. First and fourth crossveins distinctly basad of second and third; first and fourth apical cells notably longer than second and third (Fig. 11)
 Notus Fieber
 Either the first or fourth crossvein, or both, but little basad of second and third; apical cells, at least the outer three, not so contrasted in length (Figs. 13-14).....*Dikraneura* Hardy (*Erythria* Fieber)
3. Form much depressed, the head especially being greatly flattened (Fig. 18) and distinctly wider than pronotum.....*Hyloidea* new subgenus
 Form not especially depressed.....4

* Ann. Ent. Soc. Am., 18, No. 3, Sept., 1925, pp. 324-337, Pls. 21-23.

4. One apical cell angulate or pedunculate basally

Alconeura Ball & DeLong

Two apical cells pedunculate..... *Kahaono* Kirkaldy

Subgenus **Notus** Fieber.

The characters mentioned in Fieber's original description of *Notus* are not so good as can be drawn from the venation of *Cicada flavipennis* Zetterstedt, the first species he mentions which is, therefore, presumably typical. The venation of the tegmen of this species is illustrated in Fig. 11. The differences noted in the key intergrade through a series of species, and the group like other segregates of *Dikraneura* deserves no more than sub-generic rank.

Dikraneura (Notus) angustata Ball & DeLong.

Dikraneura angustata Ball, E. D., and DeLong, D. M., Ann. Ent. Soc. Am., Vol. 18, No. 3, Sept., 1925, p. 328 [Tenn.].

A female from the Baker Collection, labelled Mex. 2301, evidently is this species. A greenish cast above is more emphasized than in the specimens originally described; the face is washed with brown, and the venter is slaty.

Subgenus **Dikraneura** Hardy.

The figures (12-13) of the venation of the type species of *Dikraneura* and *Erythria* show that there is no reason for recognition of the latter as a distinct genus.

- | | |
|---|---|
| 1. Apical cells nearly uniform in length..... | 2 |
| Fourth apical cell much longer than the others..... | 3 |
| 2. Tegmina pale bluish-green..... | <i>kunzei</i> var. <i>lenta</i> new variety |
| Tegmina chiefly golden yellow..... | <i>russea</i> new species |
| 3. First apical vein recurved to costa, so that first apical cell is semicircular; base of second apical cell formed by a straight crossvein of appreciable length (Fig. 14)..... | <i>albonasa</i> new species |
| First apical vein running to exterior apical angle of tegmen, first apical cell not semi-circular; second apical cell subangulate basally..... | 4 |
| 4. Tegmen with large orange-red spots, and small bright red dots | |
| <i>lepida</i> new species | |
| Tegmen otherwise..... | 5 |
| 5. Fourth apical cell with a truncate extension costally at base, which encloses a large black spot..... | <i>myersi</i> new species |
| Fourth apical cell without such an extension and without spot..... | 6 |

6. Tegmen with a yellow to orange vitta on clavus, a dark line on apex of each of first and second sectors, and on fourth crossvein

cruentata Gillette

Tegmen whitish to yellowish hyaline, a diffuse dark spot in first, and another, sometimes more distinct in fourth, apical cell

debilis new species

Dikraneura (Dikraneura) kunzei Gillette.

Dikraneura kunzei Gillette, C. P., Proc. U. S. Nat. Mus., 20, 1898, p. 721, figs. 31-33 [Ariz.].

Without evidence from internal genitalia for the study of which there is not sufficient material, I would not specifically separate a specimen collected at Durango, Mex., by F. C. Bishopp from *D. kunzei*. It may, however, be described as var. *lenta* new variety. Male: Whole upper surface appearing finely frosted; the vertex dull reddish, the pronotum dull greenish with a pinkish-yellow anterior border, scutellum pinkish-yellow with two darker lines on disk, tegmina pale bluish-green. Face fuscous, abdomen slaty, outer claspers yellowish with a few white bristles. The form in general profile, and shape of outer claspers, are the same as in *D. kunzei*. Length 3 mm. (U. S. N. M.).

Dikraneura (Dikraneura) russea new species.

Female: Vertex yellow with a golden dot each side of the median line anteriorly; the median line itself golden anteriorly, dusky posteriorly. Rather broad anterior margin of pronotum, golden-yellow, the remainder dark brown. Scutellum yellow, the basal triangles golden. Tegmen golden yellow to crossveins, and a little posteriorly, hyaline apically except for veins and margin which are golden. Face golden, legs stramineous, venter yellow, with brownish edgings, eighth sternite fuscous, slightly convex posteriorly. Male: Pale russet throughout above, median line of vertex brownish, apical portions of tegmina hyaline. Face and legs pale russet, venter and claspers yellowish. Claspers long triangular produced into rather long slender and not much upcurved processes posteriorly, each with a few stout pale bristles near middle. Length, 2.5-3 mm.

Holotype female, and allotype male, La Ceiba, Honduras, F. J. Dyer, dated Oct. 24, and Sept. 23, 1916, respectively (U. S. N. M.).

Dikraneura (Dikraneura) albonasa new species.

Vertex rounded but distinctly longer in middle than next eye; depth of body from clypeus to posterior part of pronotum remarkably greater than

in the other species here treated (Fig. 20); a creamy white mark margins the vertex and extends over sides of pronotum narrowing posteriorly, remainder of upper surface of head and thorax, and of the scutellum russet. Tegmen touched with russet at base of costa, whitish along costal plaque which has a black spot at each end, and olivaceous otherwise to vicinity of crossveins. Areas anterior to crossveins hyaline, and apical cells fumose hyaline, with a dusky blotch in apex of cell 2. Middle of face and clypeus testaceous, upper margin and cheeks whitish. Legs testaceous, venter brown with yellowish edgings; claspers pale yellowish, with pale bristles. Venation of tegmen as in Fig. 14. Length, 3 mm.

Holotype male, Chapada, Brazil, January (U. S. N. M.).

Dikraneura (Dikraneura) lepida new species

Suggestive of *D. maculata* Gillette, but more robust, the head especially so, being noticeably wider than pronotum, and with the vertex strongly produced, and thick anteriorly as seen from side (Fig. 19); the species differs from *maculata* also in color pattern. Head and thorax suffused with pinkish, vertex with two comma-like reddish markings in the middle anteriorly, their "tails" almost meeting, with two smaller commas reversed in position near the eyes, a pair of short reddish dashes along median line anteriorly, and two large orange spots near posterior margin. Pronotum with the anterior margin more decidedly pinkish, the disk and posterior margin more or less hyaline; scutellum yellowish overlaid by pinkish. Tegmen whitish hyaline, the clavus with three irregular spots, the corium with two in an oblique row with apical claval spot, four in an oblique row just posterior to apex of clavus, two between sectors anterior to, and three posterior to, crossveins, orange-red, the spaces between these spots sprinkled with bright red dots; apical cells more or less fumose with a submarginal series of darker spots. Upper part of face whitish, clypeus blackish, intervening portions livid, legs stramineous, venter yellow; claspers with a row of pale bristles. Length, 3 mm.

Holotype male, Chapada, Brazil, April (U. S. N. M.).

Dikraneura (Dikraneura) myersi new species

Vertex well produced, rounded angulate. Color above pale golden greenish, the apical cells fumose hyaline with black spot in base of fourth as described in key. Upper part of face, legs distally, and abdomen, colored like upper surface, pleura and legs basally, stramineous. Outer claspers long triangular, with a few pale bristles exteriorly at middle, upcurved apically. Length, 2.5 mm.

Holotype male, Soledad, Cuba, Feb. 18, 1925, J. G. Myers (M. C. Z.).

Dikraneura (Dikraneura) cruentata Gillette.

Dikraneura cruentata Gillette, C. P., Proc. U. S. Nat. Mus., 20, 1898, p. 717, figs. 16-18 [New York, B. C., Colo.].

Three specimens of the yellow form of this species from Soledad, Cuba, Feb. 9, 18, and March 2, 1925, J. G. Myers.

Dikraneura (Dikraneura) debilis new species

Slender, head and thorax stramineous, in one specimen the posterior two-thirds of pronotum are suffused with pale greenish-yellow; tegmina hyaline to greenish-yellow. A dusky cloud in fourth apical cell at about level of third crossvein, and another, sometimes more distinct spot within base of first apical cell; in one specimen this is circular and jet black. Lower surface stramineous, tip of ovipositor black, eighth sternite moderately convex medianly, and concave laterally; ovipositor sheath with a row of pale bristles. Outer claspers of male long-triangular, with a few pale bristles. Length, 2.5 mm.

Holotype female, Costa Rica, Pablo Schild (McAtee); paratype, Paraiso, Canal Zone, Jan. 17, 1911, Aug. Busek (U. S. N. M.). Allotype male and paratype females, Soledad, Cuba, March 13, and March 13, 14, and 18, 1925, respectively; and a female paratype Mina Carlota, Trinidad Mts., Cuba, March 22, 1925, J. G. Myers (M. C. Z.).

Species like this with the second apical cell subangulate basally, and with the base of that cell formed by the short median part of the posteriorly projecting almost V-shaped second crossvein, are not far removed from the segregate *Alconeura*.

Subgenus **Hyoidea** new subgenus

Venation of hind wing (Fig. 15) departing but little from the *Dikraneura* standard; that of tegmen characterized by stalking of 2nd apical cell but still exhibiting nothing unknown in the genus *Dikraneura*. Subgeneric recognition is accorded the insect because of its extraordinarily depressed shape throughout. The head is remarkably flattened (Fig. 18) and is distinctly wider than pronotum.

Subgenotype the following species:

Dikraneura (Hyoidea) depressa new species

Female: Head and thorax yellowish in ground color with a percurrent russet to dusky marking covering all but narrow anterior margin of vertex, disk of pronotum, and all but extreme lateral angles of scutellum; apical third of scutellum jet black. Tegmen lemon-yellow, a dusky blotch

on middle of clavus, a dusky band over inner crossveins, and a jet black spot on first crossvein; tegminal apex sometimes touched with dusky. Underside stramineous throughout except for the black apex of ovipositor; bristles on ovipositor sheath white. Eighth sternite convex medianly, slightly concave laterally. Male similar to female, marking of head and thorax more or less tinged with reddish laterally; tegmen anterior to fourth crossvein also with a pinkish cast. Venation as in Fig. 15. Length 2.25-2.75 mm.

Holotype male, allotype, and another female, Vega Alta, Porto Rico, Jan. 21, 1920, G. N. Wolcott (U. S. N. M.).

Subgenus *Alconeura* Ball and DeLong

1. Base of fourth apical cell expanded costally, enclosing a large black spot; pronotum with four broad, longitudinal orange-red vittae

quadrivittata Gillette

Base of fourth apical cell not especially expanded and without black spot; a black spot in middle of third apical cell.....2

2. Vertex pronotum, scutellum, and clavi with a broad, brownish vitta, bordered by ivory white.....*dorsalis* DeLong

Without such a vitta; pronotum marked as in *quadrivittata*; a transverse series of dark markings in front of crossveins, in addition to the usual cloudings paralleling the cross and apical veins

unipuncta Gillette

Dikraneura (*Alconeura*) *quadrivittata* Gillette.

Dikraneura quadrivittata Gillette, C. P., Proc. U. S. Nat. Mus., 20, 1898, pp. 723-724, figs. 40-42 [L. J. Bah].

Ball and DeLong have shown that the type locality for this species is Long Island, Bahamas. It needs only a glance at the figure of tegmen given by Gillette, or that of Ball and DeLong, to show how slight a variation would serve to place the angulate but sessile third apical cell in the stalked category and thus give this species two stalked apical cells, a character which seems to be the only important one of the segregate *Kahaono* Kirkaldy. The type specimen has been available for the present study.

Dikraneura (*Alconeura*) *unipuncta* Gillette.

Dikraneura unipuncta Gillette, C. P., Proc. U. S. Nat. Mus., 20, 1898, p. 718, figs. 19-21 [Calif.].

Soledad, Cuba, March 14, 1925, J. G. Myers. A specimen taken at Washington, D. C., by the writer, July 2, 1913, is worth recording as the capture materially extends the known range of the species.

Dikraneura (Alconeura) dorsalis DeLong.

Dikraneura unipuncta dorsalis DeLong, D. M., Journ. N. Y. Ent. Soc., 32, No. 1, March, 1924, pp. 67-68 [Fla.].

Female specimens which must be this form are specifically distinguishable from *unipuncta* by the shape of the eighth sternite, which is longer and more pointed apically, the apex being notably beyond the postero-lateral angles, while in *unipuncta* the apex is only moderately angulate and extends but little beyond the posterior angles. Two females, one teneral, Mina Carlota, Trinidad Mts., Cuba, March 21, 1925, J. G. Myers.

Species not seen.

Erythria donaldsoni Baker, C. F., Invertebrata Pacifica, 1, p. 4, Sept. 1903 [Managua, Nicaragua].

Erythria guzmani Baker, C. F., Invertebrata Pacifica, 1, p. 4, Sept. 1903 [San Marcos, Nicaragua].

Erythria montealegrei Baker, C. F., Invertebrata Pacifica, 1, pp. 4-5, Sept. 1903 [Champerico, and Managua, Guatemala].

Erythria deschoni Baker, C. F., Invertebrata Pacifica, 1, p. 5, Sept. 1903 [Managua, Guatemala].

Dikraneura marginata Ball, E. D., and DeLong, D. M., Ann. Ent. Soc. Am., 18, No. 3, Sept. 1925, p. 331 [Florida, and Canal Zone]. This has been renamed *Dikraneura marginella* by C. F. Baker (Philippine Journ. Sci., 27, 1925, p. 160), because preoccupied by *D. marginata* Sahlberg, 1871.

Dikraneura sandersi Ball, E. D., and DeLong, D. M., Ann. Ent. Soc. Am., 18, No. 3, Sept. 1925, p. 332 [Panama City, Canal Zone].

Genus Typhlocybella Baker**Typhlocybella minima** Baker.

Typhlocybella minima Baker, C. F., Invertebrata Pacifica, 1, p. 3, Sept. 1903 [Managua, Nicaragua].

Specimens which almost certainly must be this species, have a submarginal vein in the wing just on the margin, which I conclude was overlooked in the original material. Venation illustrated in Fig. 16.

Specimens are at hand from Alhajuelo, Panama, March 4, 1912; Trinidad River, Panama, March 31, 1911; Paraiso, Canal Zone, Jan. 17, Feb. 7, 8, 1911, Aug. Busek; Paraiso, Canal Zone, Jan. 16, 1911, E. A. Schwarz and Aug. Busek; Costa Rica, P. Schild, and St. Vincent Id., H. H. Smith; Soledad, Cuba, Feb. 6 to April 1, 1925, J. G. Myers.

TRIBE JORUMINI

Jorumini are Eupteryginæ which lack an appendix to the tegmen, and which have 1 or 2 closed and 1 open cell in the wing. (Figs. 17, 21). Only one genus is known, and all of the species examined have distinct ocelli. The venation of the tegmen (Fig. 17) is much the same in all the species, and that of the wing is as illustrated in Fig. 17, except in a single species.

Genus *Joruma* McAtee

KEY TO THE SPECIES

1. Chiefly scarlet species, the veins of wing, at least those near costa, red 2
Species colored otherwise, veins of wing dark..... 5
2. Vertex subangulate, longer than broad..... 3
Vertex rounded, length subequal to width..... 4
3. Head uniformly scarlet; eighth sternite of female distinctly emarginate medianly *coccinea* new species
Head with anterior border of vertex pale; eighth sternite of female convex *albifrons* new species
4. Tegmen with a median crossband, and the apical third hyaline *cingulata* new species
Tegmen chiefly hyaline, color almost restricted to the margins *tergata* new species
5. Wing with two closed apical cells (Fig. 21); vertex short and rounded; general color olivaceous to dusky..... *ascripta* new species
Wing with only one closed apical cell (Fig. 17)..... 6
6. Chiefly old gold in color..... 7
The tegmina at least olivaceous or darker..... 8
7. Eighth sternite of female long produced and subangulate *aurata* new species
Eighth sternite of female nearly straight across hind margin *subaurata* new species
8. Head and thorax old gold with disk of pronotum blackish; tegmina chiefly olivaceous *peltata* new species
9. Coloration otherwise 10

10. Outer claspers of male subtriangular, the basal width equal to about one-third of the total length.....11
 Outer claspers of male elongate, the basal width much less than a third of the total length.....12
11. Vertex well rounded, reddish anteriorly.....*proxima* new species
 Vertex moderately angulate, pinkish-brown with two black spots anteriorly*semenula* new species
12. Claspers as long as, or longer than, remainder of abdomen.....13
 Claspers decidedly shorter than remainder of abdomen; vertex subangulate, with a pale marginal line reddish.....*feminea* new species
13. Claspers longer than remainder of abdomen, surpassing hypopygium; vertex bluntly rounded with a large median dusky spot connected with a vitta on face.....*adusta* McAtee
 Claspers about as long as remainder of abdomen; vertex subangulate...14
14. Claspers surpassed by the hypopygium; vertex with a pale submarginal marking, interrupted medianly.....*ebria* new species
 Claspers somewhat surpassing the hypopygium; vertex without pale submarginal marking15
15. Eighth sternite of female emarginate each side of the convex apex; ninth segment of male seen from side as wide apically as basally
atratura new species
 Eighth sternite of female moderately angulate medianly, but not emarginate laterally; ninth segment of male tapering from base, the lower posterior angle well rounded off.....*pisca* McAtee

Joruma coccinea new species

Entire body, except the yellowish venter, and tegmina to near crossveins, scarlet; apical cells and nearly equal sized areas anterior to crossveins fumose-hyaline; legs stramineous, yellowish distally, the claws black; eighth sternite distinctly, though narrowly emarginate medianly, the margin distinctly convex each side of the emargination. Eyes blackish; ocelli dusky. Length, 3 mm.

Holotype female, Costa Rica, P. Schild (McAtee).

Joruma albifrons new species

Vertex less pointed than in *J. coccinea*; colored like that species, except that the anterior margin of vertex is ivory colored, making the black ocelli and a median, triangular, scarlet mark stand out conspicuously. The eyes are paler and the extreme lateral margins of pronotum are ivory color. Claspers of male long, narrow, and flat, with a row of reddish bristles, not reaching apex of hypopygium. A female placed with this species until further evidence is forthcoming, has a black dot and no triangular scarlet mark on middle of vertex anteriorly; the eighth sternite is evenly convex posteriorly. Length, 3 mm.

Holotype male, Chapada, Brazil, August, H. H. Smith; associated female Alhajuelo, Canal Zone, March 4, 1912, Aug. Busck (U. S. N. M.).

Joruma cingulata new species

Scarlet except for a broad whitish hyaline band across tegmen covering all but base and apex of clavus, apical cells and cell-like areas anterior to crossveins 3 and 4, slightly fumose hyaline; the wings beneath the anterior hyaline band are whitish hyaline, and the abdomen has a broad yellow band around it; ocelli black, legs stramineous, reddish distally; eighth sternite of female very slightly convex posteriorly, bristles on ovipositor sheath red. Length, 3 mm.

Holotype female, Chapada, Brazil, April; paratype female, same locality, September, H. H. Smith (U. S. N. M.).

Joruma tergata new species

Head and thorax scarlet, but somewhat more tinged with orange than in the preceding species; venter yellow, dorsum yellow edged with scarlet; legs reddish-testaceous; ocelli pale. Tegmina slightly fumose hyaline, tinged with red on the margins, more broadly on the costal; fourth apical cell broader basally than in the other species. Male claspers slender, inwardly and upwardly curved, with pale bristles. Length, 3 mm.

Holotype male, Chapada, Brazil, April, H. H. Smith (U. S. N. M.).

Joruma ascripta new species

Holotype male with the head and thorax dusky olivaceous above, ocelli black, basal triangles of scutellum dusky; tegmina olivaceous, denser on clavus and between inner two pairs of sectors, clearer bordering these areas, this yellowish olive color extending along costa beyond first crossvein; apical cells otherwise, and ample areas before crossveins 2 to 4, dusky hyaline. Upper part of face ochreous, lower yellowish, venter yellow, dorsum blackish with yellow edgings, legs stramineous; male claspers slender, straight; as seen from side they are somewhat thickened apically. Venation of wing as in Fig. 21.

Allotype female similar in pattern, much darker than male, vertex, pronotum, most of scutellum and of costa, blackish. Upper part of face red; venter slaty, seventh sternite mostly whitish; eighth sternite weakly sub-angulate medianly. A female from Brazil is somewhat paler, and one from Santa Domingo is less black along costa, and has the eighth sternite pale. Length, 2.25-3 mm.

Holotype male and allotype female, Costa Rica, Pablo Schild (McAtee); other females, Chapada, Brazil, April; and Santa

Domingo, W. I., 6. 8. 05, Aug. Busek (U. S. N. M.). The latter specimen due to the crumpled state of wings was erroneously made a paratype of *J. pisca* McAtee.

Joruma aurata new species

Pale old gold in coloration, deepest on vertex, pronotum, and clavus, tegmina hyaline posteriorly except on costa; ocelli black. Underparts yellowish; eighth sternite long, narrowed from base, rather angulate medianly. Length, 3 mm.

Holotype female, Corumba, Brazil, April (U. S. N. M.).

Joruma subaurata new species

Head and thorax old gold with brownish clouding, ocelli black; tegmen nearly hyaline, washed with golden especially laterally to vicinity of crossveins on costal, and to apex of clavus on radial, margin, apical cells and nearly equal sized areas anterior to crossveins dusky; face and ovipositor sheaths (bristles pale) old gold, ovipositor brownish, other underparts yellowish; genital plate short, nearly straight across posteriorly. Length, 2.5 mm.

Holotype female, Mina Carlota, Trinidad Mts., Cuba, March 22, 1925, J. G. Myers (M. C. Z.).

Joruma peltata new species

Vertex shorter and more rounded than in *J. feminea*, yellowish anteriorly, the ocelli black, washed with old gold on disk and posteriorly, with faint brownish clouding; pronotum broadly margined anteriorly, and narrowly elsewhere with old gold, otherwise black; scutellum old gold with 2 discal dusky spots, and fainter dusky lineations basally; tegmen with apical cells and equal sized areas in front of inner three, dusky, the first apical cell black, the costa in front of it whitish, remainder of tegmen sordid olivaceous, the veins old gold. Face golden, clypeus bluish-black; pleura blue-blackish with golden edgings; abdomen chiefly yellow but with broad blue-blackish markings on disk of tergites and sternites; the sheaths although short surpass the ovipositor, the bristles are dark; genital plate short, moderately convex; legs yellowish, hind femur with a subapical ventral spot, and hind tibia with apex, brownish. Length, 3 mm.

Holotype female, Soledad, Cuba, Feb. 18, 1925, J. G. Myers (M. C. Z.).

Joruma proxima new species

Male: Colored much like the female of *ascripta* but lacking the extra cell in wing. Vertex well rounded, most of vertex, pronotum, base of scutellum, costa and whole tegmen beyond apex of clavus, fuscous; apex of scutellum,

most of corium, and clavus yellowish olivaceous. Apex of head reddish, ocelli black, face and legs stramineous. Abdomen chocolate with yellowish edgings. Male claspers fairly broad at base, long triangular, upcurved apically, with pale bristles. Length, 3 mm.

Holotype male, Chapada, Brazil, August (U. S. N. M.).

Joruma semenula new species

General color of vertex, pronotum, scutellum, and anterior half of tegmina pinkish-brown; vertex with 2 oval black spots, obliquely placed, joined basally and resting on anterior end of the median longitudinal line, and a blackish area along inner margin of each eye; ocelli black; scutellum with a black spot in each basal triangle; apical cells of tegmen and a nearly equal area in front of crossveins dusky hyaline, costal region infusate from middle, posteriorly; face and legs drab, body blackish; outer claspers of male black basally, apical third abruptly upcurved, yellowish. Female genital segment moderately convex. Length, 2.5 mm.

Holotype male, allotype, and two damaged specimens not considered type material, Mina Carlota, Trinidad Mts., Cuba, March 25, 1925, J. G. Myers (M. C. Z.).

Joruma feminea new species

Disk of vertex and of pronotum dusky olivaceous; scutellum fulvous; tegmina fumose hyaline as to apical cells and somewhat smaller areas anterior to crossveins, otherwise olivaceous, with linear margins dusky. A narrow line around front of vertex, across eye, and alongside of pronotum, whitish to yellowish, bordered more or less completely by a reddish line; ocelli black; face olive-testaceous, tending to be reddish above; other underparts olivaceous yellow, tibiae and tarsi stramineous. Claspers of male rather narrow, nearly straight, each with a row of blackish bristles. Eighth sternite of female slightly pointed medianly; ovipositor sheaths slaty, each with a row of pale bristles. Venation as in Fig. 17. Length, 3-3.25 mm. Coloration more vivid in the females.

Holotype male, allotype female, and paratypes of both sexes, Costa Rica, Pablo Schild (McAtee).

Joruma ebria new species

Color pattern much as in *J. feminea*. Disk of vertex, of pronotum, and scutellum fulvous; extreme lateral margin of pronotum white, and marking along anterior margin of vertex, interrupted medianly, ivory; ocelli black; face reddish. Tegmina yellow olivaceous and fumose hyaline, the pattern as in *J. feminea*; costa tinged with reddish. Legs stramineous; abdomen testaceous. Length, 3 mm.

Holotype male, Chapada, Brazil, January (U. S. N. M.).

Joruma adusta McAtee

Joruma adusta McAtee, W. L., Florida Entomologist, Vol. 8, Nos. 3-4 (Dec., 1924), Feb., 1925, p. 35 [Brazil].

The Figures, 1 and 2, p. 33, erroneously labelled *J. pisca*, really illustrate this species; however, the venation in the two is practically identical.

Joruma atratula new species

Body blackish, tegmina fuscous, duskier in the apical cells; lower part of face, pleura, legs, and base of genitalia stramineous; 9th segment as described in key, blackish; apical half of outer claspers fuscous. A female, apparently teneral and therefore not made a type, is fuscous above, even yellowish on vertex, has a reddish band between eyes, the face yellowish-brown above, yellow below, the legs and genital plate stramineous; the genital plate is distinctly emarginate each side of the strongly convex median part of the hind margin; ovipositor sheaths black, the bristles pale. Length, 3 mm.

Holotype male, Mina Carlota, Trinidad Mts., Cuba, March 19, 1925, J. G. Myers (M. C. Z.). The female mentioned was collected at the same place on March 25.

Joruma pisca McAtee.

Joruma pisca McAtee, W. L., Fla. Ent., Vol. 8, Nos. 3-4 (Dec. 1924), Feb. 1925, p. 34 [Maryland].

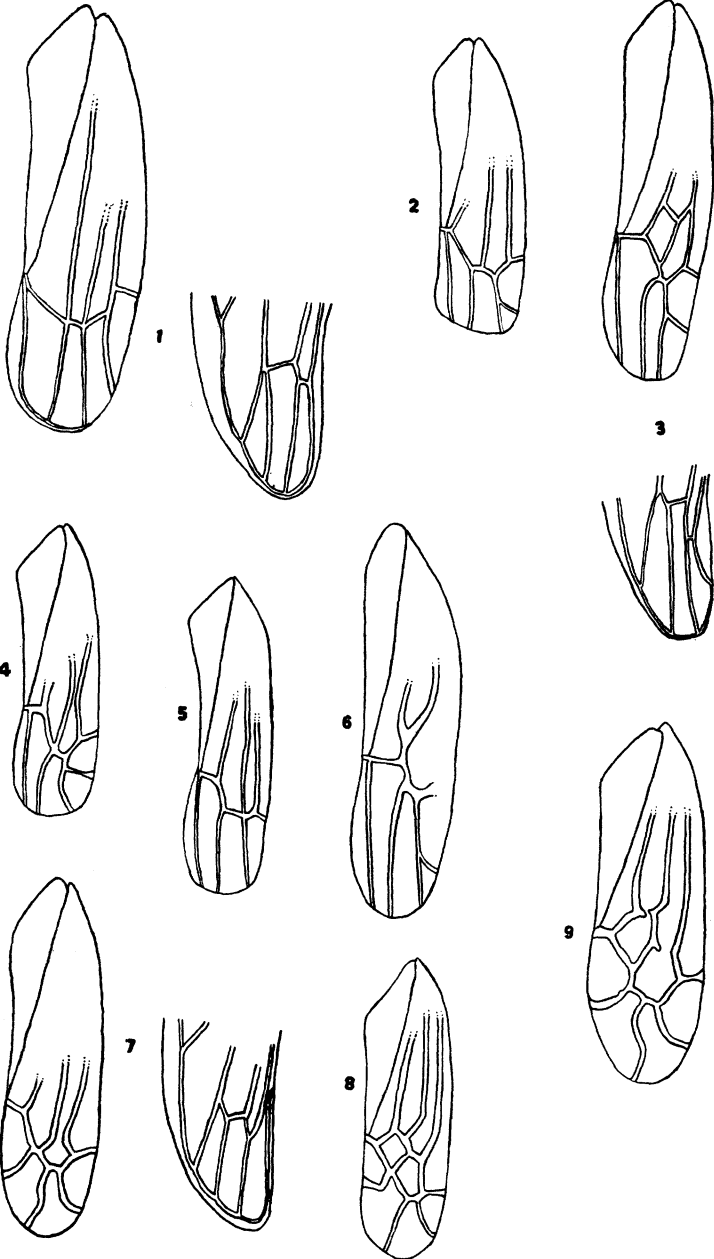
One of the Central American specimens cited is here assigned to another species (*J. ascripta*) while the other from La Ceiba, Honduras, is provisionally left with *J. pisca* until further specimens are received.

TRIBE TYPHLOCYBINI

The species of *Typhlocyba* that have been described from the neotropics are recorded in my revision of that genus (in press, Proc. U. S. Nat. Mus., Vol. 68). I have no evidence of the occurrence of the genera *Erythroneura*, *Hymetta*, and *Eupteryx* in the region.

PLATE XIX

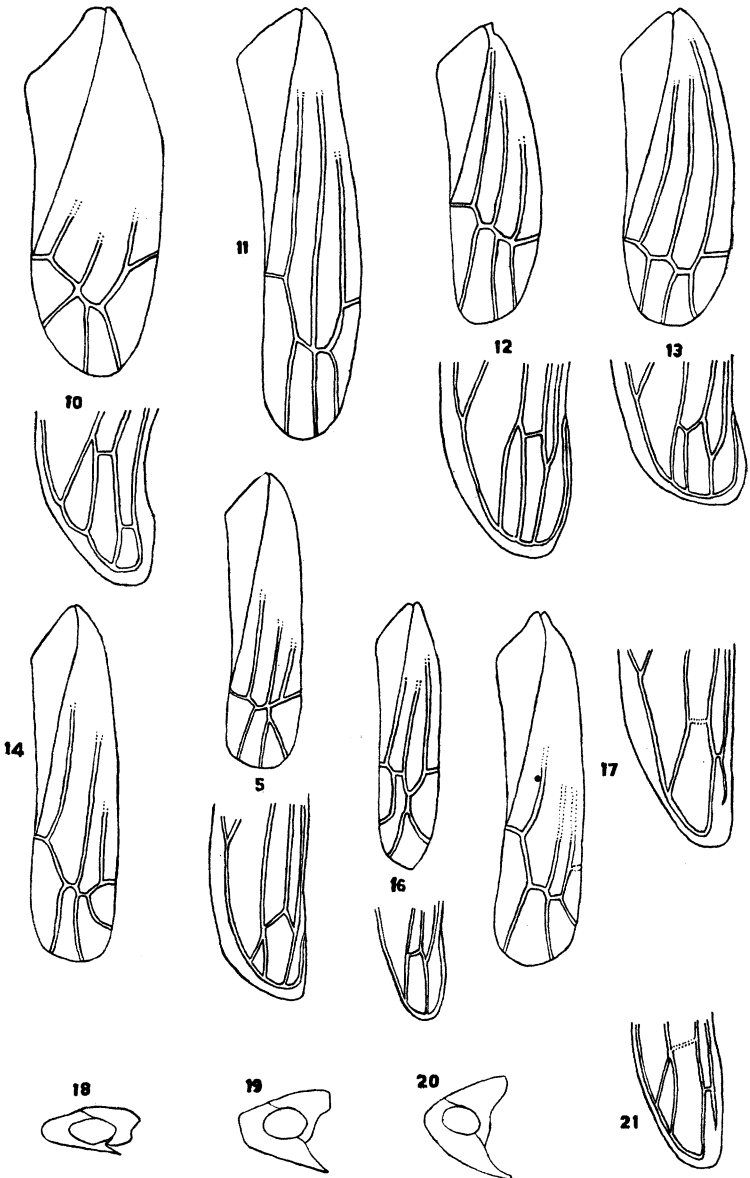
- Figure 1. Venation of tegmen and wing of *Alebra albostriella*.
Figure 2. Venation of tegmen of *Protalebra* (*Protalebra*) *brasiliensis*.
Figure 3. Venation of tegmen and wing of *Protalebra* (*Plagalebra*) *singularis*.
Figure 4. Venation of tegmen of *Protalebra* (*Paralebra*) *similis*.
Figure 5. Venation of tegmen of *Protalebra* (*Kallebra*) *ninettae*.
Figure 6. Venation of tegmen of *Protalebra* (*Aphanalebra*) *unipuncta*.
Figure 7. Venation of tegmen and wing of *Parallaxis vacillans*.
Figure 8. Venation of tegmen of *Parallaxis clathrata*.
Figure 9. Venation of tegmen of *Parallaxis tessellata*.



EUPTERYGINAE

PLATE XX

- Figure 10. Venation of tegmen and wing of *Eualebra smithii*.
- Figure 11. Venation of tegmen of *Dikraneura (Notus) flavipennis*; of wing as in 12.
- Figure 12. Venation of tegmen and wing of *Dikraneura (Dikraneura) variata* Hardy.
- Figure 13. Venation of tegmen and wing of *Dikraneura (Dikraneura = Erythria) aureola* Fallén.
- Figure 14. Venation of tegmen of *Dikraneura (Dikraneura) albonasa*.
- Figure 15. Venation of tegmen and wing of *Dikraneura (Hyloidea) depressa*.
- Figure 16. Venation of tegmen and wing of *Typhlocybella minima*.
- Figure 17. Venation of tegmen and wing of *Joruma feminea*.
- Figure 18. Profile of *Dikraneura (Hyloidea) depressa*.
- Figure 19. Profile of *Dikraneura (Dikraneura) lepida*.
- Figure 20. Profile of *Dikraneura (Dikraneura) albonasa*.
- Figure 21. Venation of wing of *Joruma ascripta*.



EUPTERYGINAE