THE UNIVERSITY OF KANSAS
SCIENCE BULLETIN

VOL. XXIV.] JULY 15, 1936 [No. 14.

Species of Erythroneura of the Comes Group (Homoptera-Cicadellidae)

R. H. BEAMER, Department of Entomology, University of Kansas

ABSTRACT: North American species of Erythroneura (grape leaf hoppers) of the Comes group are reviewed. Seventy species and varieties are included. One was unrecognizable: (*E. octonotata* Walsh), seventeen are placed in synonymy: *E. vitis* var. *flava* Robinson and *E. vitis* var. *venusta* McA. (= *E. vitis* (Harris) n. syn.); *E. fusco-flava* Beamer (= *E. bistrata* McA. n. syn.); *E. rubranotum* Rob. (= *bistrata* var. *stricta* McA. n. syn.); *E. tricincta* var. *rubravitta* Rob. (= *diva* McA. n. syn.); *E. tricincta* var. *erasa* McA. (= *E. calycula* McA. n. syn.); *E. breakeyi* Johnson (= *E. pontifex* McA. n. syn.); *E. mallochi* McA. (= *E. rosa* Rob. n. syn.); *E. portea* Rob. (= *E. reflecta* McA. n. syn.); *E. attenuata* Johnston (= *E. nudata* McA. n. syn.); *E. tudella* Rob. and *E. scripta* Rob. (= *E. delicata* var. *accepta* McA. n. syn.); *E. ornata* Osb. (= *E. corni* Rob. n. syn.); *E. comes* var. *suffusa* McA. (= *E. bidens* McA. n. syn.); *E. irrorata* Rob. (= *E. rubra* (Gill.) n. syn.); *E. cherokee* Rob. and *nigroscuta* Johnson (= *E.* compta McA. n. syn.); and the following are described as new: *E. prima, E. festiva, E. tacita, E. ziczac* var. *walshi*. All existing types have been examined. Drawings of male genitalia, keys to groups, species and varieties are included. Types of the new species are in the Snow collection, University of Kansas, Lawrence, Kan.

INTRODUCTION

IN this paper I have attempted to bring together all of the North American species of Erythroneura of the Comes group as defined by Wm. Robinson, University of Kansas Sci. Bul., vol. XVI, March, 1926. Seventy species and varieties are treated. One of this number was not recognizable, eighteen are placed as synonyms and four are described as new. All existing types have been studied, most of the males dissected and the internal genitalia figured.

It is this group to which most of our economic grape leaf hoppers

belong. The cultivated grape is without doubt the greatest sufferer, with the majority of the species and varieties listed feeding on this host. Virginia creeper, Boston ivy, red bud, willow and various species of dogwood are also hosts to some of the forms.

GROUPS OF ERYTHRONEURA

The genus Erythroneura was divided into six groups by W. L. McAtee, Trans. Amer. Ent. Soc., vol. XLVI, 1920. Wm. Robinson in Univ. of Kan. Sci. Bul., vol. XVI, No. 3, March, 1926, further revised the genus into five groups, giving them names instead of numbers, as did McAtee. After the dissection of many thousands of specimens I propose a further revision into four groups. It was found that the Scutelleris and Maculata groups of Robinson vary from one to the other and the genitalia were more or less of one type. The Scutelleris group is therefore dropped. It must always be borne in mind when using wing veins as diagnostic characters that they are variable. In general, however, they follow the characters pointed out in the keys.

KEY TO GROUPS OF ERYTHRONEURA

1. M-Cu cross vein present 2
   M-Cu cross vein usually absent, media and cubitus forming a more or less continuous line 3
2. Base of cell M_4 curved; two posteriorly diverging vittae usually present on vertex and pronotum .....*obliqua group*
   Base of cell M_4 angulate; vertex and pronotum not marked as above; cross veins usually white .....*vulnerata group*
3. Base of cell M_4 oblique; apex of cell R_3 without black spot....*maculata group*
   Base of cell M_4 square; apex of cell R_3 with black spot or cloud....*comes group*

KEY TO THE SPECIES AND VARIETIES OF ERYTHRONEURA OF THE COMES GROUP

1. Color markings of dorsum one or more transverse bands or, solidly colored..... 2
   Color markings of dorsum not transverse bands nor solidly colored..... 16
2. (1) Dorsum infuscated throughout .....(1) *infuscata* (Gill.), p. 265
   Dorsum cross-banded (not so definite in *E. bistrata*)..... 3
3. (2) Dorsum with one crossband .....(2) *amanda* McA., p. 265
   Dorsum with more than one crossband 4
4. (3) Anterior crossband covering base of tegmina 5
   Anterior crossband not covering base of tegmina 8
5. (4) Usually a semblance of inverted V on vertex; last abdominal segment of male more or less infuscated 6
   Markings of vertex usually confined to a wide basal spot; last ventral segment of male stramineous 7
6. (5) Markings of dorsum distinct bands .....(3) *vitis* Harris, p. 266
   Markings of dorsum almost solid; light areas confined to a circle of spots *vitis* var. *corona* McA., p. 267
7. (5) Color of dorsum often almost solid, all bands more or less connected (4) *bistrata* McA., p. 267
   Color of dorsum in distinct crossbands .....*bistrata* var. *stricta* McA., p. 268
8. (4) Anterior crossband involving base of scutellum 9
   Anterior crossband not involving base of scutellum 13

9. (8) Anterior crossband covering all of pronotum except small part of anterior margin 10
Anterior crossband leaving most of disc of pronotum bare 12
10. (9) Crossbands one and two of different colors.....*rosa* var. *repitita* McA., p. 282
Crossband one and two same color..... 11
11. (10) Crossband one and two sanguineous to black.....(5) *tricincta* Fitch, p. 268
Crossbands one and two bright red.....(6) *diva* McA., p. 269
12. (9) All crossbands continuous .....(7) *calycula* McA., p. 270
Crossbands broken .....*calycula* var. *noncincta* John., p. 270
13. (8) Crossband one covering most of pronotum 14
Crossband one leaving most of disc of pronotum uncovered 15
14. (13) Crossband one sanguineous to dusky .....(8) *integra* McA., p. 271
Crossband one bright red.....*diva* var. *complementa* McA., p. 269
15. (13) Crossband continuous across hind margin of pronotum..(9) *cymbium* McA., p. 271
Crossband broadly interrupted on hind margin
cymbium var. *disjuncta* McA., p. 272
16. (1) Angulate vittae continuous from humerus to crossveins 17
Angulate vittae not continuous from humerus to crossveins 40
17. (16) Without definite colored spot on apex of clavus 18
With a definite colored spot on apex of clavus 20
18. (17) Marking of vertex a broad stripe .....(1) *fraxa* Rob., p. 272
Markings of vertex definitely V-shaped 19
19. (18) Elytral markings narrow, of uniform width, red or orange
(11) *acuticephala* Rob., p. 272
Elytral markings broad, of varying widths, brownish....(12) *elegans* McA., p. 273
20. (17) Basal two thirds of clavus bright red.....*compta* var. *rufomaculata* McA., p. 292
Basal two thirds of clavus not bright red 21
21. (20) Dorsum from base of scutellum to crossveins occupied by a light diamond-shaped spot .....(13) *cancellata* McA., p. 273
Dorsum not occupied by a large light spot 22
22. (21) Pronotum usually redbrown to black (lateral margins light in *E. aclys* McAtee) 23
Pronotum not redbrown to black 25
23. (22) Lateral margins of pronotum light .....(14) *aclys* McA., p. 274
Lateral margins of pronotum dark 24
24. (23) Vertex reddish brown .....(15) *prosata* Johnson, p. 275
Vertex light with red marks .....(16) *ziczac* Walsh, p. 275
25. (22) Basal angles of scutellum usually with large black spots 26
Basal angles of scutellum without definite back spots 27
26. (25) Vertex sharp pointed, tube of aedeagus projecting, posterior point of style almost as long as foot .....(17) *elegantula* Osb., p. 277
Vertex blunt, apex of aedeagus truncate .....(18) *coloradensis* (Gill.), p. 277
27. (25) Red markings of clavus overlaid with velvety black, (14) *palimpsesta* McA., p. 278
Red markings of clavus not overlaid with black 28
28. (27) Principal markings of vertex two black fingerlike marks, (2) *pontifex* McA., p. 279
Principal markings of vertex not two black fingerlike marks..... 29
29. (28) Median longitudinal red vitta on vertex .....(21) *kanwakae* Rob., p. 279
Markings of vertex not a median vitta 30
30. (29 Main dorsal vittae more or less darkened; posterior point of style much shorter than foot (except in *reflecta*) 31
Main dorsal vittae orange; posterior point of style longer than foot (except in *ancora*) 37
31. (30) Markings of dorsum lighter, scarcely any dark color 32
Markings of dorsum distinctly dark colored 33
32. (31) Processes of aedeagus coiled near middle (Ariz.) ....(22) *anfracta* Beamer, p. 280
Processes of aedeagus not coiled near middle .....(23) *vitifex* Fitch, p. 28
33. (31) Color markings of vertex usually enclosing three round white dots 34
Color markings of vertex not enclosing three round white dots 35
34. (33) Basal angles of scutellum usually dark; outer processes of pygofer hook about one fourth as long as inner, sides of aedeagus rounded
(24) *caetra* McA., p. 281

Basal angles of scutellum usually not so dark; outer processes of pygofer almost absent; aedeagus in dorsoventral view with sides almost parallel (25) *rosa* Rob., p. 282

35. (33) Zigzag vittae of dorsum even sided; processes of aedeagus in lateral view not narrowed suddenly 36
Zigzag vittae of dorsum enlarged over disc of elytra, usually forming a complicated pattern; processes of aedeagus in lateral view rapidly narrowed near middle .....(26) *reflecta* McA., p. 283

36. (35) Zigzag vittae of dorsum narrower and more definite; pygofer hook U-shaped with two processes.....*ziczac* var. *walshi*, n. var., p. 276
Zigzag vittae of dorsum more suffused; pygofer hook with three processes .....(27) *prima* n. sp., p. 283

37. (30) Usually dorsal markings very narrow; aedeagus in dorsoventral view broad, bell-shaped, processes scarcely diverging.....(28) *nudata* McA., p. 284
Dorsal markings usually heavier; aedeagus not as above 38

38. (37) Aedeagus in dorsoventral view narrow, many times longer than wide 39
Aedeagus in dorsoventral view broad, not much longer than wide (29) *beameri* Rob., p. 285

39. (38) Posterior point of style longer than foot.....(30) vaga Johnson, p. 285
Posterior point of style much shorter than foot.....(31) *ancora* Beamer, p. 285

40. (16) Markings of vertex usually more than an inverted V..... 41
Markings of vertex usually not more than an inverted orange V or a median stripe 50

41. (40) Markings of clavus usually consisting of three spots (*E. omaska* may have just two) 42
Markings of clavus consisting of two spots 44

42. (41) Markings of dorsum heavy; milky colored background not so evident; shaft of aedeagus in dorsoventral view narrow, tip bifid..(32) *omaska* Rob., p. 286
Markings of dorsum very delicate; general ground color milky white; aedeagus in dorsoventral view broad 43

43. (42) Median spot of clavus without dark spot .....(33) *delicata* McA., p. 286
Median spot of clavus with dark spot .....*delicata* var. *accepta* McA. p. 287

44. (41) Vertex with dark median line 45
Vertex with light median line 48

45. (44) Vertex and pronotum often suffused with brown 46
Vertex and pronotum not suffused with brown 47

46. (45) Processes of pygofer hook almost touching at apex .....(34) *corni* Rob., p. 287
Outer process of pygofer hook slightly more than half as long as inner; tip of latter enlarged .....(35) *bidens* McA., p. 287

47. (45) Aedeagus in dorsoventral view one half as broad as long, (36) *rubrella* McA., p. 288
Aedeagus in dorsoventral view very narrow, many times longer than wide (37) *ontari* Rob., p. 289

48. (44) Body very dark, showing through elytra..... 49
Body light, not darkening upper surface .....(38) *aza* Rob., p. 289

49. (48) Markings of dorsum broad; posterior point of style short, (39) *rubra* (Gill.), p. 290
Markings narrow; posterior point of style as long as foot, (40) *festiva* n. sp., p. 290

50. (40) Usually some dark markings on scutellum and on anchor-shaped spot of clavus .....(41) *compta* McA., p. 291
No dark markings on scutellum and on anchor-shaped spot of clavus..... 51

51. (50) Process of aedeagus in lateral view with notch or projecting point near middle .....(42) *comes* (Say), p. 292
Process of aedeagus without such a notch 52

52. (51) Markings of vertex a median longitudinal vittae .....(43) *tacita* n. sp., p. 293
Markings of vertex usually V-shaped 53

53. (52) Aedeagus in dorsoventral view broad, bell-shaped; outer process of pygofer hook not over half as long as inner .....*nudata* McA., p. 284
Aedeagus in dorsoventral view broad but strongly constricted on basal half; outer process of pygofer hook almost as long as inner..(44) *gilensis* Beamer, p. 293

1. *Erythroneura infuscata* (Gillette)

Typhlocyba comes var. *infuscata* Gillette, C. P. Am. Typhlocybinae, 1898, p. 764.

The only specimen mentioned in the original description was type number 3451 in the United States National Museum. This description, a very short, terse one, does not fit this type 3451. W. L. McAtee, Trans. Am. Ent. Soc., vol. XLVI, 1920, redescribed the type as follows: "Smoky brown to black above, in some cases underlaid by deep dull red, a little paler at rondure of vertex, especially on sides, pronotum sometimes faintly paler on disc, and scutellum sometimes with a pale median vitta; tegmina with more or less hyaline spots at base, middle and apex of inner margin of clavus, middle of radial margin of fourth apical cell and on costal margin of second apical cell; costal plaque opaque whitish, tinged with red, an almost equal area of dull red just posterior, and costal margin and to some extent the crossveins pencilled with dull red. Face and legs pale yellow, abdominal incisures, etc., sometimes pale yellow."

Genitalia. Pygofer hook U-shaped, outer process about half as long as inner. Foot of style medium, heel small; base almost straight; anterior point about half as long as width of foot; posterior point shorter and sharper. Aedeagus in dorsoventral view broad, tube projecting sharply, lateral margins narrowing rapidly toward base.

This beautiful dusky species is quite common throughout the United States east of the Rocky Mountains.

2. *Erythroneura amanda* McA.

Erythroneura comes var. *amanda* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 319, 1924.

This striking species is easily separated from all others in the Comes group by the large, almost triangular, reddish brown spot which occupies most of clavus, corium between clavus and costal plaque and apex of scutellum. The male genitalia show a very close relation with *E. compta* McA., from which it differs only in minor details. If the external markings were like that species it would be difficult indeed to separate them.

Genitalia. Pygofer hook U-shaped. Foot of style large; heel short and sharp; base straight; anterior point short, sharp; posterior point longer than foot, almost parallel-sided. Aedeagus in ventral view rather broad, diamond-shaped, with each process bifid.

This species differs from *compta* in having the base of the processes of the aedeagus somewhat heavier and in the sides of the pygofer hook being longer.

Specimens are at hand from Douglas, Atchison, Cherokee and Wyandotte counties, Kansas.

3. *Erythroneura vitis* (Harris)

Tettigonia vitis Harris, T. W., Encyclopedia Americana, VIII, p. 43, 1831.
Erythroneura vitis var. flava Robinson, Can., Ent., vol. LVI, No. 3, p. 62; 1924.
Erythroneura vitis var. *venusta* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 319, 1920.

The original description is as follows: "It may be called *tettigonia vitis* (Harris). It is, in its perfect state, nearly one tenth of an inch long; of a straw color, with two broad, scarlet bands across the wing cases, one at the base and the other on the middle, and the tips of the wing cases are blackish."

General ground color yellowish white. Vertex marked with pair of reddish, longitudinal arcs, probably remnant of orange inverted V. Pronotum of type male, red on lateral margins, much lighter on median two thirds with darker Y-shaped mark at middle. Most specimens are uniformly dark reddish-brown throughout most of surface. Scutellum of type buff with two longitudinal pink stripes and pink tip. Elytra with base and median band bright red. Anterior cross band wider than scutellum on costal margin, narrower next scutellum. Median band not quite covering tip of claws. Costal plaque with large black spot, cross veins more or less red, beyond infuscated. Venter more or less stramineous, mesosternum usually darker and last ventral segment of male darkened.

Genitalia. Style with foot short; heel moderate; base curved; anterior point sharp, slightly longer than posterior; posterior point narrower and shorter, about half as long as base. Aedeagus small, tip broad, sharply narrowed on basal two thirds. Pair of heavy almost parallel processes, longer than aedeagus, almost straight.

Type in collection of Boston Society of Natural History.

This species is usually easily separated from closely related forms by the semblance of an inverted V on the vertex and the darkened last ventral segment of the male.

Through the courtesy of the board of directors and Mr. Richard Dow, of the Boston Society of Natural History, I was able to study the male genitalia and a water color of the type.

This is a common species on grape throughout the United States east of the Rocky Mountains.

Erythroneura vitis var. *corona* McAtee

Erythroneura vitis var. *corona* McAtee, W. L., Trans. Am. Ent. Soc., 46, p. 305, 1920.

Original description. "Similar to variety *vitis* Harris, but middle crossband on tegmina connected by red lines along longitudinal veins to anterior crossband and to ramose marking on cross veins, so that the saddle mark appears to be surrounded by a wreath of pale spots."

A study of male genitalia of specimens with the above markings shows no marked difference from *vitis* Harris. The markings are so characteristic, however, that the varietal name is retained.

Type, female, Plummer's Island, Maryland, in collection of McAtee. Since McAtee did not designate an allotype a male from Windsor, Vermont, 21, VIII, 1934, R. H. Beamer, is here so designated.

This variety is even more plentiful on grape than *E. vitis* over the same territory. The same dark last ventral segment in the male and the inverted V of the vertex, as in *E. vitis,* separate this species from the *E. bistrata* forms and the enlarged middle band encircled with a ring of white spots sets it off from *E. vitis.*

4. *Erythroneura bistrata* McAtee

Erythroneura vitis var. *bistrata* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 305, 1920.

Erythroneura fusco-clava Beamer, R. H., Can. Ent. 1927, p. 31, LIX.

Original description. "This variety illustrates the extreme degree of erythrization of this species I have seen; the vertex may be pale yellow, but usually it has the normal pair of vittae strongly developed, and it may be almost entirely red; the pronotum is red with touches of pale yellow on anterior border, with a dot in middle and traces of pale yellow at about two points on the hind margin; scutellum red with a pale median vitta enlarged at apex; tegmen often entirely red with the exception of a pale spot at inner base of clavus and another involving apex of clavus and adjoining corium; there may be other traces, however, of both anterior and posterior pale bands, and the costal plaque, except for its posterior blackish marking, and an equal sized area behind it and the bases of the apical cells are pale; undersurface and legs chiefly pale yellow."

Dissection of the male type revealed a type of genitalia sufficiently different from *E. vitis* (Harris) to be worthy of specific rank.

Genitalia. Pygofer hook typically U-shaped. Foot of style of medium length, heel definite; base almost straight; anterior point

short and sharp, about as long as foot is wide inside points; posterior point about two thirds as long as foot, slightly wider at base than anterior, sides almost straight, converging to sharp point. Aedeagus in dorsoventral view more or less diamond-shape, widest near middle and tapering to rather narrow apex and slightly wider base. Aedeagal processes rather slender, reaching almost to tip of shaft, then bending at right angles for about one third their length.

Type male in the collection of W. L. McAtee.

As Mr. McAtee states in the description, this species is quite variable in color pattern. The vertex markings, however, are usually just rectangular spots covering most of base, leaving outer third, at least, unmarked. This and lack of the darkened last ventral segment in the male easily separates this form and *E. bistrata* var. *stricta* McAtee from *E. vitis* (Harris) and its variety.

It occurs in large numbers in some localities, but not so plentiful usually as the variety *stricta*.

Erythroneura bistrata var. *stricta* McAtee

Erythroneura vitis var. *stricta* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 305; 1920.
Erythroneura rubranotum Robinson, Wm., Can. Ent., vol. LVI, No. 3, p. 60; 1924.

Original description. "Ground color whitish hyaline to pale yellow; vertex chiefly pale, sometimes with a few touches of red, pronotum and scutellum chiefly pale, sometimes with a few touches of red, pronotum and scutellum chiefly red to dusky, the latter sometimes pale medianly and at tip; tegmen with three crossbands, the anterior red, narrow, not exceeding scutellum, the middle one narrower than in the other varieties, usually nearly quadrilateral in shape; the posterior much as in first variety, pale spaces between the bands broader than in the other varieties; usually half or more of costal plaque bluish or blackish, often overlaid by opaque white; lower surface stramineous to pale yellow."

Dissections of males of this variety exhibit the same type of genitalia as *E. bistrata*, so it is given as a variety of that species. The vertexal marks and the color of the last ventral segment of the male are the same as in that species.

This is a very common variety, often occurring in great numbers on grape. Distribution same as for *E. bistrata*.

5. *Erythroneura tricincta* Fitch

Erythroneura tricincta Fitch, Asa, N. Y. State Cab., p. 63, 1851.

Original description. "Three-banded Erythroneura, *E. tricincta*. Pale yellow, with three broad bands, the anterior velvet-black, oc-

cupying the thorax and basal half of the scutel; the middle bright ferruginous ending outwardly in black, forward of the middle of the elytra, the posterior dusky brown, on the apex. Length, 0.12. No. 823, female."

Genitalia. Pygofer hook U-shaped, outer process about one third as long as inner. Foot of style medium; heel medium; base slightly curved; anterior point broad, almost as long as toe is wide; posterior point less than half as long, sharp. Aedeagus in dorsoventral view broad, tube projecting, processes longer than shaft, in lateral view bent around tip of shaft. This is the outstanding internal character in separating this form from *E. calycula* McA.

Even though a very short description, it is very good and one should have no trouble in determining this insect. It is very common throughout the eastern half of the United States and Canada.

6. *Erythroneura diva* McAtee

Erythroneura tricincta var. *diva* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 308; 1920.
Erythroneura tricincta var. *rubravitta* Robinson, Wm., Can. Ent., vol. LVI, No. 7, p. 156; 1924.

Original description. "Crossbands one and two chiefly bright red; crossband one covering most of pronotum and base of scutellum, where its color sometimes is brownish yellow instead of red; crossband two, bright red to costal plaque which is chiefly blackish, more or less overlaid by opaque white; longitudinal color markings sulphur yellow."

Genitalia. Pygofer hook U-shaped, outer process almost as long as inner. Foot of style medium; heel almost absent; base straight; anterior point broad, almost as long as toe is wide; posterior point sharp and short, not more than one third as long as anterior. Aedeagus in dorsoventral view broad, almost circular, processes about as long as shaft with tooth near middle on outside margin. It is this tooth that is the distinctive internal character of this species.

Since this species was described from a holotype female, a male paratype, Plummer's Island, Md., Jan 23, 1916, W. L. McAtee, described above, is here designated allotype.

A fairly common species throughout the eastern half of the United States.

Erythroneura diva var. *complementa* McA.

Erythroneura tricincta var. *complementa* McAtee, W. L., Ill. Nat. Hist. Surv., vol. XVI, Art. III, p. 135; 1926.

Original description. "Crossbands one and two bright red, three dusky, differing from var. *diva* McA. in crossband one being confined to pronotum; subsidiary markings yellow. Length, 2.75 mm.

"*Holotype.* Female, Ocean Springs, Miss., Aug. 4, 1921, C. J. Drake."

Numerous specimens of this beautiful insect from Orange county, Texas, have been studied with no real difference becoming apparent between it and *E. diva* McA. other than the darker base of the scutellum in *diva*. In my estimation it is but the summer form of this species.

Specimens are at hand from Orange county, Texas, Inverness, Hilliard, Wildwood and Fort Meade, Fla.

7. *Erythroneura calycula* McAtee

Erythroneura tricincta var. *calycula* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 308, 1920.

Erythroneura tricincta var. *erasa* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 309, 1920.

Original description. "Ground color ivory, a broad U-shaped dusky to black band on base of scutellum and sides of pronotum, the often concolorous eyes extending it on vertex; crossband two sanguineous to dusky, black on costa; longitudinal color streaks red."

This is a beautiful, quite definitely marked species and the color of the first crossband, as described by McAtee, will separate it from all others.

Genitalia. Pygofer hook U-shaped, outer process about one third as long as inner. Foot medium; heel medium; base almost straight; anterior point wide, as long as toe; posterior point sharp, not over one third as long as the anterior. Aedeagus in dorsoventral view broad, tube very slightly projecting, processes about as long as shaft not curved around the tip in lateral view.

Common on grape throughout the eastern half of the United States and Canada.

Erythroneura calycula var. *noncincta* Johnson

Erythroneura tricincta var. *noncincta* Johnson, Dorothy M., Ohio Jr. Sci. No. 4, p. 261, 1934.

Original description. "There are no true crossbands in this variety which is closely related to *Erythroneura tricincta* var. *calycula* McAtee, as the basal angles of scutellum and sides of pronotum behind the black eyes are dark. There are dark reddish triangular spots, bordering side of costal plaques, and not attaining clavi which are immaculate. The background is creamy white and faint yellow-colored streaks follow the longitudinal veins of the elytra. The cross veins are narrowly black, heavily margined anteriorly, except the fourth, with bright red; apical cells dusky."

This is a variety of doubtful validity although a few specimens are at hand from Louisiana. It occurs very rarely.

8. *Erythroneura integra* McAtee

Erythroneura tricincta var. *integra* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 309, 1920.

Original description. "Crossband one, sanguineous to dusky, confined to pronotum, most of which it covers; crossband two bright red to sanguineous, bluish to black on costa; longitudinal color markings red."

A very distinctive species marked as described above.

Genitalia. Pygofer hook U-shaped, outer process very short, about one fourth as long as inner. Foot of style medium; heel small; base curved; anterior point broad, about as long as width of foot in narrowest place; posterior point narrow, sharp, about one fourth as long as anterior. Aedeagus in dorsoventral view almost circular, tube projecting, processes about as long as shaft, slightly diverging on outer half.

A male paratype, Plummer's Island, Md., March 18, 1917, W. L. McAtee, described above, is here designated allotype. Holotype female, allotype, and paratypes in McAtee collection. Fairly common throughout the eastern half of the United States.

9. *Erythroneura cymbium* McAtee

Erythroneura tricincta var. *cymbium* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 310, 1920.

Original description. "Crossband one, dusky to black, confined to pronotum, profoundly emarginate anteriorly, leaving a large part of disk uncolored; crossband two, sanguineous to red, bluish to black on costa; longitudinal color streaks yellow."

Genitalia. Pygofer hook U-shaped, outer process almost as long as inner. Foot of style medium; heel marked; base curved; anterior point broad at base, almost as long as width of foot; posterior point, short, sharp, about one third as long as anterior. Aedeagus in dorsoventral view almost circular, tube slightly projecting, processes about as long as shaft, slightly diverging on outer third.

A common species over the eastern half of the United States. Holotype female, Pennsylvania, in collection of W. L. McAtee. Allotype male, described above, White county, Illinois, March 31, 1929, in Snow Entomological Collection.

Erythroneura cymbium var. *disjuncta* McAtee

Erythroneura tricincta var. *disjuncta* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 310, 1920.

Original description. "Like the last, *cymbium,* but crossband (if it may be so called) one, broadly interrupted in the middle, covering only sides of pronotum."

A variety of doubtful value, but sometimes occurring. A few specimens are at hand from Louisiana and Illinois.

10. *Erythroneura fraxa* Rob.

Erythroneura fraxa Robinson, W. M., Can. Ent., vol. LVI, No. 12, p. 292; 1924.

This beautiful red marked species described by Robinson from a single female has since been found in numbers. A male specimen from Anderson county, Kansas, November 26, 1927, is figured as the allotype.

Genitalia. Pygofer hook of typical U-shape with points of U rather shorter than usual. Style with small foot; base almost straight; anterior point short, and sharp; posterior point about half as long as base and quite sharp. Aedeagus in ventral view rather bluntly diamond-shaped with slender processes roundingly separated.

This species resembles *E. kanwakae* Rob., but is larger, vertex blunter, orange spot of vertex in form of round spot rather than parallel-sided stripe, spot on tip of clavus more just an indication of a spot, seemingly about to disappear, pygofer hook with but two prongs and aedeagus in dorsoventral view more diamond-shaped than rectangular.

Numerous specimens at hand from Kansas, Arkansas, and Illinois.

11. *Erythroneura acuticephala* Robinson

Erythroneura acuticephala Robinson, Wm., Can. Ent., vol. LVI, No. 3, p. 61; 1924.

This bright orange-marked little species resembles *E. kanwakae* Rob., but may be easily separated by the absence of most dark marking on abdomen, by posterior point of style as long as foot and without extra process in pygofer hook.

Genitalia. Pygofer hook typical U-shaped. Foot of style small; heel prominent; base curved, anterior point fairly long and thick; posterior point more than half as long as base, very thin and sharp. Aedeagus in ventral view truncate with a small projection at either corner, processes small, about as long as shaft, diverging to about width of shaft.

Specimens at hand from Douglas, Anderson, and Cherokee counties, Kansas, and Ramsey county, Minnesota.

12. *Erythroneura elegans* McAtee

Erythroneura comes var. *elegans* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 305; 1920.

General ground color yellowish white marked with orange or reddish-brown. Vertex with inverted U-shaped mark, arms enlarged at base, continued on pronotum as very heavy Y-shaped mark. Pronotum with an additional vitta back of each eye. Scutellum mostly dark reddish with lighter spot near apex. Elytra with six light areas, two more or less pentagonal mesal spots, smaller at tip of scutellum, other on apex of clavus, one angular dash from costa to claval suture between humerus and plaque and the other between the plaque and cross veins. Cross veins pink or red. Apical cells more or less infuscated, darker spot in costal plaque and apex of cell R_3. Mesosternum dark.

Genitalia. Pygofer hook U-shaped, inner process about one-fourth longer than outer. Foot of style small; heel prominent; base almost straight; anterior point two thirds as long as width of foot at narrowest place; posterior point slightly shorter, both sharp. Aedeagus in dorsoventral view more or less three pronged, processes about as long as shaft, almost parallel and about straight in lateral view.

Redescribed from the male holotype, Plummer's Island, Md., Jan. 11, 1914; W. L. McAtee. In his collection.

This species externally resembles *E. ziczac* Walsh, but may be separated from that species by the lack of an orange spot on apex of clavus and by the colored zigzag vitta of dorsum being of varied widths.

A beautiful species distributed throughout most of the United States.

13. *Erythroneura cancellata* McAtee

Erythroneura comes var. *cancellata* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 320; 1920.

This is one of the most striking species in the genus with its beautiful lighter colored diamond-shaped spot occupying a large portion of dorsum of elytra, surrounded by the darker wine color.

Genitalia. Pygofer with typical *comes* U-shaped hook. Style with small foot; base curved; anterior point short and heavy; pos-

terior point short and sharp. Aedeagus in lateral view almost circular with processes diverging one third distance before tip.

Although not as plentiful as some, specimens of this species are not uncommon in the states east of the Rocky Mountains.

This species was described from 2 females from Plummer's Island, Md., one designated type, the other paratype and in the collection of W. L. McAtee. A male from Anderson county, Kansas, described above is therefore designated allotype.

Miss Dorothy M. Johnson's statement "female (holotype) Adams county, IX-1-31, E. P. B." Ohio State Univ. Bul. 31 Vol. 39, 1935, p. 109, is evidently an error.

14. *Erythroneura aclys* McAtee

Erythroneura aclys McAtee, W. L., Trans. Am. Ent. Soc., vol. XLVI, p. 290, 1920.

Original description. "Base of fourth apical cell angulate, vertex rather pointed; color pattern consisting of a broad, brown to black stripe extending whole length of insect, margined by pale yellow. The dorsal stripe nearly black on scutellum and anterior parts sharply cut off from a pale yellow margin about the width of eye; on tegmina the stripe is smoky brown, greatly expanded and irregularly set off from the pale yellow costal margin, percurrent to second apical cell which is about the width of costal plaque; the latter has a slight opaque whitish coating, is margined interiorly and anteriorly by reddish, and underlaid posteriorly by blackish; there are touches of red upon apex of clavus and first cross vein and more or less hyaline spots at extremities of apical third of clavus, on the corium nearby and in middle of fourth apical cell. The legs, pleura and face vary from flesh-color to pale yellow, and the venter is pale yellow with a median series of slaty spots, the posterior ones extending entirely across last abdominal segment and across base of genitalia; dorsum slaty."

Genitalia. Pygofer hook U-shaped, outer process about two thirds as long as inner. Foot of style medium; heel small; base straight; anterior point almost as long as width of foot; posterior point about as long as base. Aedeagus in dorsoventral view, broad, almost quadrangular, tube projecting, lateral margins with long sharp projecting apices.

This is a very common species throughout the United States east of the Rocky Mountains.

15. *Erythroneura prosata* Johnson

Erythroneura infuscata var. *prosata* Johnson, Dorothy M., Ohio Biol. Survey Bul. 31, p. 108, 1935.

Resembling *E. ziczac* Walsh, but with much more dark coloring on vertex pronotum and elytra, by posterior point of style being as long as base of foot, sharp, and by processes diverging radically on outer third.

General color, blood-brown. Vertex sometimes with red inverted V evident, often with median longitudinal stripe and two lateral spots light. Thorax also with Y-shaped median and lateral red dashes more or less evident. Scutellum usually with a median longitudinal light rectangular spot, often spool-shaped. Clavus with small median light spot on mesal margin, another smaller spot slightly outside claval suture and toward cross veins and an indication of a light spot on apex, the three forming a semi-circle. Corium with oblique oblong area anterior to costal plaque; costal plaque, except dark oblique spot in outer end and two spots beyond plaque, light. Light areas usually bounded with red. Cross veins lighter, apical cells dark with clear areas sometimes present. Mesosternum dark.

Genitalia. Pygofer hook U-shaped, outer process about half as long as inner. Foot of style medium; heel prominent; base straight; anterior point half as long as width of foot, sharp; posterior point as long as base, straight. Aedeagus in dorsoventral view broad, tube protruding, shaft sharply constricted on basal half, processes sharply diverging on outer half.

Named from three specimens from Pickaway county, and Coal Grove, Ohio. Numerous specimens are at hand from Wabash county, Illinois.

16. *Erythroneura ziczac* Walsh

Erythroneura ziczac Walsh, B. D., Prairie Farmer 10, No. 10, 1862, p. 149.

The original description is as follows: "Pale yellowish. Front of head in a right angle, the apex rounded. Eyes dusky; ocelli pale; vertex with two pale sanguineous vittae, generally subobsolete. Thorax blood-brown, yellowish in front, often with a yellowish vitta; scutel blood-brown with a yellowish vitta, occasionally entirely yellowish. Abdomen often blood-brown, except at base and tip; tip of ovipositor and of tarsi dusky. Elytra pale yellowish; on the middle of the costa an oblique rhomboidal black spot, on the

costal tip a black dot, and on the interior margin, forming a triangle with the other two spots, a black spot; a blood-brown, irregular broad strip, covering the humerus, thence running to the interior margin, thence in a zigzag direction to the rhomboidal spot, thence to the spot on the interior margin, thence not quite attaining the terminal dot. Wings hyaline; tips of costal veins, often dusky. Length to tip of wings a little over one tenth inch. Occurs abundantly on the grapevine."

A careful study of Walsh's description with specimens at hand reveals the fact that what has commonly been called *E. ziczac* is not true *ziczac* at all but the light form of this species which I am describing as *E. ziczac* var. *walshi.* True *E. ziczac* is much darker throughout with all of the pronotum "blood-brown" except a small rectangular area on anterior margin.

Since Walsh's types are lost a male and female from Wabash county, Illinois, March 31, 1929, are here selected as neotypes. Other specimens are at hand from Illinois, Ohio, Indiana, New York, and Vineland, Ontario. (Plate XIX, fig. 16.)

Erythroneura ziczac var. *walshi* n. var.

Resembling *E. ziczac* Walsh but with lighter coloring, narrower markings, and pronotum never dark colored on basal two thirds.

Color. General ground color yellowish white, markings red to dusky. Vertex with inverted V-shaped red mark, sometimes closed basally. Pronotum with Y-shaped and lateral bands red to dusky. Scutellum with basal angles yellow bordered with red, apex red. Tegmen with red to dusky zigzag stripe arising on humerus, ending at base of cell M_4. Red spot on apex of clavus. Cross vein red. Apical cells more or less dusky.

Holotype male Jefferson county, Nebraska, Beamer and Hungerford. Allotype female, Reno county, Kansas, August 13, 1924, Beamer and Lawson, and the following paratypes, 10 males and 6 females same data as allotype; 7 males and 11 females, Douglas county, Kansas; 5 males and 2 females, Atchison county, Kansas; 3 males and 6 females, Jordan, Ontario, Aug. 1922, Wm. Robinson; 3 males and 3 females, Vineland, Ontario, Wm. Robinson; 1 female Clayton county, Iowa, 1930, R. H. Beamer.

Examination of the genitalia of many specimens failed to reveal any characteristic differences between this and *E. ziczac* Walsh. They are, however, easily distinquished by the absence of the dark coloring on the posterior two thirds of the pronotum.

17. *Erythroneura elegantula* Osborn

Erythroneura elegantula Osborn, Herbert, An. Carnegie Mus., Pitts., 1928, p. 289.

Resembling *Erythroneura coloradensis* (Gill.), but with much more pointed vertex, widely separated arms of the inverted V of the vertex, rounded tip of the aedeagus in ventral view and posterior point of style being longer than anterior.

General ground color ivory with principal markings red or orange. Vertex with narrow-sided inverted V with arms widely separated, sometimes touching eyes. Pronotum with median Y-shaped mark sometimes not touching either margin and a dash back of each eye. Scutellum usually with basal angles black but often just yellow, apex usually red or orange. Clavus with typical anchor-shaped spot and smaller one on apex. Corium with dash on base, an irregular sided vittae surrounding costal plaque, extending to claval suture before apex and usually fading out about base of cell M_4. Black dash in posterior end of costal plaque, small round black spot in apex of cell R_3 and larger one in base of cell R_4. Abdomen dark, especially the dorsum, which often gives the elytra a darker appearance.

Genitalia. Pygofer hook U-shaped, one arm much shorter than other. Style with small foot; heel small but prominent, base curved, anterior point about twice as wide as posterior and about as long, posterior point sharper, about as long as base. Aedeagus in ventral view more or less globular, somewhat pointed at apex, usual pair of processes rather short and almost parallel.

Redescribed from the types in Osborn Collection labeled "Canal Zone, Panama."

This is one of the commonest and most destructive species found on grape in California. Specimens are also at hand from Colorado and Kansas.

18. *Erythroneura coloradensis* (Gill.)

Typhlocyba vitifex var. *coloradensis* Gillette, C. P., Bul. 19, Colo. Agr. Exp. Sta., May, 1892, p. 16, fig. 8.

Redescribed from the types in U. S. Nat. Mus. General ground color semihyaline to yellowish white. Markings orange. Vertex with inverted orange V not touching eyes. Pronotum with median V, heavy basally, arms short; lateral dashes back of eyes, not reaching posterior margin. Scutellum with basal angles black surrounded by yellow tip tinged with orange. Clavus with heavy basal anchor spot and another at tip. Corium with oblique dash near base and an irregular sided vitta arising on costa at anterior end of costal

plaque, almost surrounding it, touching claval suture near apex of anchor spot, following vein Cu to end in cross veins. Black spot in posterior end of costal plaque, another in apex of cell R_3, a third in base of cell M_4, cross veins pink, apex of elytra more or less infuscated. Venter stramineous, face marked with pink, mesosternum and abdomen more or less infuscated.

Genitalia. Style with short foot; heel inconspicuous; anterior point longer than foot, wider than posterior; posterior point shorter and sharper almost as long as base. Tip of aedeagus in dorsoventral view truncate, processes reaching tip, slightly diverging. Pygofer hook typically U-shaped.

Hololectotype male No. 3447, U. S. Nat. Mus., allolectotype, female, No. 3447, U. S. Nat. Mus.

This is a very common species in the central United States on grape and Virginia creeper. It is easily separated from other species by the blunt vertex and the two round black spots in basal angle of scutellum.

19. *Erythroneura palimpsesta* McAtee

Erythroneura comes var. *palimpsesta* McAtee, W. L., Ill. Nat. Hist. Survey, Bul., vol. XV, Art. II, p. 43, 1924.

Original description. "Like *E. comes* var. *vitifex* Fitch except that the red vitta on anterior half of clavus and the adjacent short vitta on corium are overlaid or replaced by black; the lateral vittae on pronotum and the sides of the scutellum also may be dusky to black, and the oblique dusky band of antennae, pro- and mesopleuro, base and apex of genitalia and broad vittae on dorsum of abdomen also may be dusky to black. Length, 3 mm.

"Holotype male, and two females, one of which is allotype, Forest City, Ill., April 3, 1917."

This species is easily separated from all others, as McAtee points out by the black coloring overlying the red in the basal anchor-shaped mark of the clavus as well as some of the spots of the corium. The red mark of the vertex differs too in that it is oval or sometimes almost round.

Genitalia. Pygofer hook U-shaped, outer process about one fourth shorter than inner. Foot of style large; heel prominent, projecting; base curved; anterior point short, blunt; posterior point longer than foot, narrow, almost parallel sided. Aedeagus in dorsoventral view bell-shaped, apex truncate, processes as long as shaft diverging on outer half.

This species is quite rare. Specimens are at hand from Illinois and Kansas. Types in the Collection of the Illinois Natural History Survey, Urbana, Ill.

20. *Erythroneura pontifex* McAtee

Erythroneura comes var. *pontifex* McAtee, W. L., Ill. Nat. Hist. Sur. Bul., vol. 16, p. 136, 1926.

Erythroneura breakeyi Johnson, Dorothy M., Ohio Jr. Sci., No. 4, p. 261, 1934.

Original description. "Like *E. comes* var. *reflecta* McAtee (Bul. Ill. State Nat. Hist. Sur., 15, Art. II, April, 1924, p. 43, Md., Va., Ill., Ia., Kan.), but with two black finger-shaped vittae on vertex overlying an inverted heart-shaped brownish marking; a marking somewhat similar to latter can be seen through the disk of pronotum. Length, 3 mm.

Holotype female, Dubois, Ill., May 24, 1917. Deposited in the collection of the Illinois State Natural History Survey."

General ground color white, markings reddish fumose to black. Vertex with inverted V with arms usually connected basally, mostly black. Pronotum with infuscated red Y and a short red dash back of each eye. Scutellum with basal angles yellow margined with red, apex red. Zigzag markings of elytra more or less infuscated. Cross veins red. Apical cells more or less fumose.

Genitalia. Pygofer hook U-shaped, outer process about half as long as inner. Foot of style large; heel prominent; base almost straight; anterior point very short; posterior point longer than foot, sides almost parallel. Aedeagus in dorsoventral view with very broad lateral wings, canal protruding, processes longer than shaft, bent almost at right angles out on outer third. Processes in lateral view without abrupt narrowing as in *E. reflecta* McAtee.

Since this species was named from a female holotype, the male described above, Wabash county, Illinois, March 31, 1929, is designated allotype.

This species resembles *E. reflecta* McAtee, but is easily separated from that species by the black on the red inverted V of the vertex.

Not a very common species, but found throughout the eastern half of the United States.

21. *Erythroneura kanwakae* Robinson

Erythroneura kanwakae Robinson, Wm., Can. Ent., vol. LVI, No. 12, p. 292; 1924.

This species closely resembles *E. fraxa* Rob., but may be separated from it by being smaller with head much sharper pointed,

with much more dark coloring on venter of abdomen, aedeagus almost rectangular in dorsal view, posterior point very short and pygofer hook with three processes instead of two.

Genitalia. Pygofer hook U-shaped with an additional process somewhat longer than shorter process and slightly shorter than the longest. This character is unique in this species. Foot of style very short; base curved; both points short and not very sharp. Aedeagus about rectangular in ventral view, sides almost parallel, processes present, about as long as shaft, slightly divergent at tip.

Specimens are at hand from Kansas, Nebraska, and Iowa.

22. *Erythroneura anfracta* Beamer

Erythroneura anfracta Beamer, R. H., Ann. Ent. Soc. Am., vol. XXII, p. 123; 1929.

Most easily confused with *E. vitifex* Fitch, from which it may be separated by the fumose coloring in the red markings, by each process of aedeagus having a distinct spiral near base, sometimes incomplete and by aedeagus in ventral view having narrower lateral processes.

Common in Arizona on grape.

23. *Erythroneura vitifex* Fitch

Erythroneura vitifex Fitch, Asa. Rep., N. Y. Ag. Soc. 16, pp. 392-393, 1856.

Original description, in part: "Yellowish white, the wing covers with oblique confluent blood red bands and a short oblique black line on the middle of their outer margin; thorax commonly with three red stripes, the middle one forked anteriorly and confluent with two red stripes on the middle of their outer margin; thorax commonly with three red stripes, the middle one forked anteriorly and confluent with two red stripes on the crown of the head. Length, 0.12. When the wing covers are closed they appear red with a cream-colored spot shaped like a heart anteriorly, and on their middle a large diamond-shaped spot with a small red spot in its center. It resembles an individual of the *comes* of Say, having the red spots so enlarged as to all run together, but the marks upon the thorax are totally different from those of that species . . ."

General ground color yellowish white marked with orange. Vertex with orange inverted V, continued across pronotum as Y. Pronotum with an additional stripe on lateral margin. Scutellum with basal angles and tip orange. Elytra with rather broad zigzag vitta from humerus to cross veins, more or less surrounding costal plaque. An additional oblique dash on costa near base. Cross

veins red. Apical cells more or less infuscated. Black dash in posterior end of costal plaque, black spot in base of cell M_4 and apex of cell R_3. Mesosternum black.

Genitalia. Pygofer hook U-shaped outer process about one third as long as inner. Foot of style small; heel not prominent; base more or less curved; anterior point broad, about as long as foot in narrowest place; posterior point short and sharp, not more than half as long as anterior. Aedeagus in dorsoventral view heart-shaped, processes longer than shaft, often diverging.

Since the types of this species are lost the male, Vineland, Ontario, Aug., 1922, described above is designated neotype.

E. vitifex Fitch closely resembles *E. beameri* Rob., but may be separated by the dark mesosternum and by the short posterior point of foot of style.

This is a damaging hopper on grape throughout the eastern half of North America.

24. *Erythroneura caetra* McAtee

Erythroneura ligata var. *caetra* McAtee, W. L., Proc. Biol. Soc., Wash., vol. 37, p. 133, Dec., 1924.

E. caetra McA. resembles *E. Rosa* Rob. quite closely, but occurs west of the Rocky Mountains, the color of pronotum usually is not evenly distributed, and outer process of pygofer hook is about one third as long as inner.

General ground color semihyaline to yellowish white with dusky and reddish markings. Vertex yellowish with some darker shading, nothing very definite. Pronotum with semblance of U-shaped darker mark; large angular brown spots tinged with red back of each eye. Scutellum with tip orange, basal angles dark brown. Clavi with usual anchor-shaped basal mark very large, tip tinged with pink, remainder dusky, elongated pink spot on tip. Coria with irregular-sided pink mark beginning opposite pink tip of anchor-shaped mark on clavi, reaching to plaque, following around it almost to costa at its posterior end, ending on Cu before base at cell M_4. Black or smoky stripe running almost length of R_3, crossing base of M_2 and ending in darker spot in base of M_4. Black spot in posterior end of costal plaque. Tip of front with black spot, mesosternum shining black, dorsum of abdomen and most of ventral sclerites black.

Genitalia. Pygofer hook semi-U-shaped, the outer process much shorter than in typical *comes* groups, about one fifth as long as inner. Foot of style rather small; heel medium; anterior point long, sharp,

less than right angle; posterior point very short, obtuse angled. Aedeagus in ventral view flattened, almost parallel sided, constricted just before tip, ventral processes usually short, almost straight, not reaching nearly to tip. In lateral view shaft almost straight, broad, almost half as wide as long, evenly hollowed out at tip, ventrally notched.

A male, described above, La Fayette, Cal., July 14, 1933, Mrs. R. H. Beamer, is here designated allotype. The species was described from a single female in the collection of E. D. Ball. Other specimens are at hand from Idaho, Oregon, and British Columbia. It is commonly found on willow. According to Doctor Ball's notes this is the host of the type.

It is possible this is a synonym of *E. rosa* Rob. as they are very close indeed, but since the ranges are different and there seems to be some slight morphological differences I prefer to consider them distinct.

25. *Erythroneura rosa* Robinson

Erythroneura rosa Robinson, Wm., Can. Ent., vol. LVI, No. 3, p. 58, March, 1924.
Erythroneura mallochi McAtee, W. L., Bul. Ill. Nat. Hist. Sur., vol. XV, Art. II, p. 41, April, 1924.

This species is quite variable in coloring. It may usually be distinguished from *E. caetra* McA. by having markings of the clavus evenly distributed, by having a broader aedeagus in ventral view and the short point of pygofer hook almost absent.

Genitalia. Pygofer hook sickle-shaped, outer point very short. Foot of style short; heel almost absent; anterior point about half as long as width of toe, sharp; posterior point almost absent. Aedeagus in dorsoventral view rectangular, lateral margins almost parallel, processes shorter than shaft, diverging sharply near tip.

This is a very common species on willow in the United States east of the Rocky Mountains.

Erythroneura rosa var. *repetita* McAtee

Erythroneura repetita McAtee, W. L., Bul. Ill. Nat. Hist. Survey, vol. XVI, Art. III, p. 131, Aug. 10, 1926.

Specimens of this variety may easily be separated from those of *E. rosa* Rob. by having the color of the dorsum in the form of three crossbands. The anterior crossband is usually darker while the middle one is often quite red as in *E. vitis* (Harris). Numerous specimens of this variety were swept from willow in Scott county, Arkansas, August, 1928, along with a lot of other variations, including typical *E. rosa* Rob.

26. *Erythroneura reflecta* McAtee

Erythroneura comes var. *reflecta* McAtee, W. L., Ill. Nat. Hist. Sur. Bul., vol. 15, p. 43, April, 1924.

Erythroneura portea Robinson, Wm., Can. Ent., vol. 56, No. 7, p. 154, 1924.

Original description. "Much like *E. comes* var. *rubra* Gillette in connection with which it was mentioned in my key, but the pale markings are more extensive, and the red ones, instead of being a solid jasper-red as in that form, are dilute bluish-red with carmine edgings; the fact that all of the red vittae are of this compound character gives the variety the appearance of having the most complex pattern of any of the *comes* varieties.

"Type female, Plummer's Island, Md., etc."

General ground color yellowish-white, with the following markings: Vertex with inverted V-shaped, reddish vitta. Pronotum with a slaty-brown area on disk with two reddish arms projecting forward to meet the vitta on vertex; a lateral vitta behind each eye. Scutellum with basal angles yellow surrounded with red, apex yellow. Tegmina, a reddish vitta arising in base of clavus, soon broadening and proceeding across corium to costal plaque, where it becomes as wide as length of plaque, then proceeding inward and dividing into two arms, one of which touches tip of clavus and the other the base of cell M_4. This vitta is sometimes paler within and margined in dark red; sometimes bluish within dark red margin; tip of clavus pale red. Cross veins crimson, apical cells more or less infuscated.

Genitalia. Pygofer hook U-shaped, outer process about half as long as inner. Foot of style large; heel prominent; base straight; anterior point short, slightly less than a right angle; posterior point longer than foot, narrow, almost parallel sided. Aedeagus in dorsoventral view broad, tube slightly projecting, processes longer than shaft, diverging sharply on outer half, in lateral view contracting sharply near middle.

This is a very common species throughout the eastern half of the United States and Canada. It is quite variable in color. Especially is the summer form different from the overwintering. It is often quite light on anterior half while the elytra have the markings concentrated into a large circular area, which is often bright red. The contracted process of the aedeagus seen in lateral view separates this species from all others.

27. *Erythroneura prima* n. sp.

Resembling *E. rubra* (Gill.), but color on vertex in two longitudinal vitta, color on elytra in even sided zigzag stripes, pygofer hook

with three processes, and processes of aedeagus with recurved lateral hooks.

General ground color yellowish-white marked with brownish-red. Vertex with two longitudinal narrow vittae, in winter specimens this may be one bar. Pronotum with heavy median Y-shaped spot with large irregular-shaped spot back of each eye. Scutellum with basal angles reddish. Clavus reddish-brown except small oval spot at tip of scutellum and another smaller one two thirds distance to apex. Corium with zigzag vitta arising on costa at anterior end of costal plaque, widening to broadly touch claval suture near apex of anchor spot and ending in cross veins near base of cell M_4. Cross veins bright red. Apical cells more or less dusky. Venter dark.

Genitalia. Pygofer hook U-shaped with three processes in graduated series, outer the shortest. Style of foot small; heel evident; base curved; anterior point about one third as long as toe is wide, about as wide at base as length; posterior point just about a right angle, scarcely evident. Aedeagus in dorsoventral view spatulate; processes shorter than shaft, apices sharp, diverging with recurved hook on outer margin.

Holotype, male, allotype female, 1 male, and 6 female paratypes, Bretton Woods, N. H., August 31, 1934, R. H. Beamer. In Snow Entomological Collection.

28. *Erythroneura nudata* McAtee

Erythroneura comes var. *nudata* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 316, 1920.

Erythroneura attenuata Johnson, Dorothy M., Ohio Jr. Sci., vol. XXXIV, No. 4, July, 1934.

Original description. "Color of scutellum and anterior parts pale yellowish with irregular pellucid areas, instead of the color vittae and spots usually present in other varieties; tegmina whitish hyaline, apical cells somewhat fumose; costal plaque rather opaque white, an oblique black streak across it posteriorly, and black dots in bases of fourth apical, and apices of second apical cells. Placed as a variety of *comes* because of the presence of dark spots in apices of second apical cells, altho so far as coloration goes no intergrading specimens have been seen."

This species was described from teneral specimens and has only been recognizable through the internal male genitalia.

General ground color yellowish-white marked with red or orange. Vertex with inverted V quite narrow, continued across pronotum as a thin Y. Lateral margins of pronotum with a narrow vitta.

Scutellum with basal angles yellow, often bordered with red, tip orange. Elytra with typical orange markings of *E. comes*. Apical cells more or less infuscated. Black line in posterior end of costal plaque, spot in base of cell M_4 and apex of cell R_3.

Genitalia. Pygofer hook U-shaped, inner process more than twice as long as outer. Foot of style large; heel medium; base straight; anterior point about as long as shortest width of foot; posterior point much longer than foot, about as wide at base as foot at narrowest place. Aedeagus in dorsoventral view quite broad, bell-shaped, processes about as long as shaft, heavy, slightly divergent.

This species is close to *E. beameri* Rob. but may be separated from it by the broad bell-shaped aedeagus and heavier, straighter processes.

A common species throughout the eastern half of the United States.

29. *Erythroneura beameri* Robinson

Erythroneura beameri Robinson, Wm., Can. Ent., vol. LVI, No. 3, p. 61; 1924.

Resembles *Erythroneura vitifex* Fitch, but may be separated by its light mesosternum, and by the very long posterior point of style.

A very common species in the United States east of the Rocky Mountains.

30. *Erythroneura vaga* Johnson

Erythroneura vage Johnson, Dorothy M., Ohio Jr. Sci., No. 4, p. 260, 1934.

This species is close to *E. comes* (Say) or *E. beameri* Rob., but may usually be separated from those species by the extra lateral orange marks on the vertex and quite easily by the long slender shaft of aedeagus with bifid tip.

Named originally from two specimens. Numerous specimens are at hand from Louisiana, Arkansas, Illinois and Kansas.

Unlike the drawing of the type most specimens have an additional spine beneath the base of the aedeagal shaft.

31. *Erythroneura ancora* Beamer

Erythroneura ancora Beamer, R. H., Ann. Ent. Soc. Am., vol. XXII, p. 122; 1929.

This species is near *E. omaska* Rob., but may be separated by color on vertex confined to inverted V, dark marking near cross veins confined to black spot in base of cell M_4 and aedeagus without divided tip. It has not been taken since the type series from Culberson county, Texas.

32. *Erythroneura omaska* Robinson

Erythroneura omaska Robinson, Wm., Can. Ent., vol. LVI, No. 3, p. 61; 1924.

This species is often milky white as in *E. delicata* McAtee and may be confused with this species, but is usually easily separated by the broader pink or orange markings.

Genitalia. Pygofer hook U-shaped, both arms practically same size. Foot of style small; heel prominent; base curved; anterior point almost as long as width of foot at narrowest place; posterior point about half as long. Aedeagus long and slender, bifid on outer fifth, pair of slender lateral processes near middle, in lateral view bent dorsally on apical fifth.

This is a very common species throughout the United States east of the Rocky Mountains. Specimens are at hand from Kansas, Illinois, Arkansas and Louisiana.

33. *Erythroneura delicata* McAtee

Erythroneura comes var. *delicata* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 317, 1920.

Erythroneura lacta Robinson, Wm., Can. Ent., LVI, No. 3, p. 62; 1924.

Original description. "Ground color milky white, with red color markings of the *comes* type, the spots usually small and well separated."

This beautiful species is easily distinguished by its milk-white general color with delicate pink markings. Poorly marked specimens of *E. omaska* Rob. might be confused with it but may be separated by the male genitalia and much broader pink markings.

Vertex with thin inverted pink U-shaped mark with curving sides. Pronotum with narrow median Y-shaped spot and small dash on each lateral margin pink. Scutellum with basal angles yellow, tip pink. Clavus with anchor-shaped basal spot broken into a small basal dash and larger apical portion, another small dash near apex. Corium with oblique dash near base, a vitta arising on costa at anterior end of costal plaque, following its inner margin with offshoot to meet claval suture near its middle, angling to end in base of cell M_4. Cross veins pink. Apical cells more or less infuscated. Venter yellowish white with mesosternum and last ventral segment of male fuscous.

Genitalia. Pygofer hook U-shaped, inner arm more slender and about one third longer than outer. Foot of style small; heel small; base curved; anterior point medium sized, outer face convex; posterior point very small, one third as wide as anterior and very short

and sharp. Aedeagus in dorsoventral view, for the most part broad, canal produced in middle, lateral margins with sharp, forward projections about one third distance from apex, usual processes almost parallel and not reaching to apex.

Holotype female, Plummer's Island, Md., July 26, 1914; W. L. McAtee. Since no allotype was made a male paratype, described above, Plummer's Island, Md., Oct. 26, 1913, W. L. McAtee, is so designated.

Types in collection of W. L. McAtee.

This beautiful milk-white species is very common in the United States east of the Rocky Mountains.

Erythroneura delicata var. *accepta* McAtee

Erythroneura comes var. *accepta* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 317; 1920.

Erythroneura scripta Robinson, Wm., Can. Ent., vol. LVI, No. 12, p. 290; 1924.

Erythroneura tudella Robinson, Wm., Can. Ent., vol. LVI, No. 12, p. 291; 1924.

Like *Erythroneura delicata* McAtee, but with a dark mark in the orange spot near middle of clavus. It occurs over the same range but is not so common.

34. *Erythroneura corni* Robinson

Erythroneura corni Robinson, Wm., Can. Ent., Vol. LVI, No. 3, p. 60; March 1924.

Erythroneura ornata Osborn, H., Ohio Biol. Surv. Bul., XIV, p. 364, 1928.

This is the common species on *cornus* in central and southern United States. It may usually be distinguished by the red marks of vertex and pronotum being suffused with fuscous and by the rather indefiniteness of the markings in general. The slender aedeagus in ventral view, the more definite points on the foot of style and the forks of the pygofer hook touching or almost touching are also characteristic.

A very common species east of Rocky Mountains.

35. *Erythroneura bidens* McAtee

Erythroneura comes var. *bidens* McAtee, W. L., Fla. Ent., vol. VIII, p. 39; December, 1924.

Erythroneura comes var. *suffusa* McAtee, W. L., Fla. Ent., vol. VIII, December 24, 1924, p. 39.

Original description. "Like *E. comes* var. *rubra* Gillette, except that the upper surface of pronotum save a semielliptical space on each anterior angle, and a semicircular spot in middle of front margin, is black. Length, 2.8 mm. Holotype male, Virginia near Stubblefield Fall, on *Pinus virginiana,* October 23, 1921, J. R. Malloch."

Specimens from Glen Echo, Md., and others near Washington, D. C., collected by P. W. Oman, on comparison with the holotype, a female instead of a male, as the original description states, are unquestionably this species.

General ground color semihyaline to whitish with orange and fuscous marks. Vertex red, with a pair of mesal longitudinal white vittae and an additional row of white spots on each side. Pronotum usually fuscous, but sometimes orange except three white spots on anterior margin. Scutellum orange to fuscous. Clavus with anchor-shaped mark and another elongated area before tip orange. Corium with irregular-sided vitta on costa, surrounding costal plaque, approaching claval suture at three points and touching cross veins on costal and mesal margin. Apical cells dark. Venter dark. Legs lighter.

Genitalia. Pygofer hook large, long side with tip enlarged and bent out at about right angles, about twice as long as short side. Style with medium foot, medium heel and rather short anterior and posterior point. Aedeagus with shaft narrow, rather long, parallel-sided, in lateral view bent dorsally on outer third.

This species is distinguished from the others found on *Cornus* sp. by the thickened outwardly angled long point of pygofer hook. The dark pronotum will distinguish most specimens of *bidens*, but I have a few from Illinois that lack this color.

36. *Erythroneura rubrella* McAtee

Erythroneura comes var. *rubrella* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 316, Aug. 26, 1920.

General ground color milky white with the dark body color visible; markings bright red. Vertex red except two median longitudinal vittae separated by narrow red line, two round spots near each eye and marginal band around tip of vertex which are yellowish white. Pronotum with broad Y-shaped median mark and marginal band red. Scutellum with basal angles yellow, remainder red except inverted white T-shaped mark. Clavus with usual red basal anchor-shaped mark and another elongated spot near apex. Corium with red irregular sided vittae arising near base more or less surrounding plaque, ending in cross veins near tip of Cu. Cross veins slightly brighter red. Apical cells more or less infuscated. Black spot in posterior end of costal plaque. Venter dark.

Genitalia. Pygofer hook double; inner fork heavy at base, twice as long as outer, curved out on outer half at right angles to basal; outer fork narrower, leaving base at an angle, forming gentle curve

toward inner fork. Style with median foot; toe broad; anterior and posterior points usually small but not so well marked as in *E. corni* Rob. Aedeagus in dorsal view short and thick, half as broad as long, evenly narrowed on outer half to sharp tip, quite spinose; in lateral view short and thick, tip slightly curved dorsally.

Type dissected and numerous specimens studied from British Columbia, Arkansas, Mississippi, Illinois.

This is structurally very distinct from all the other forms. The very broad aedeagus is quite different from the long slender structure found in the others.

37. *Erythroneura ontari* Robinson

Erythroneura ontari Robinson, Wm., Can. Ent., vol. LVI, p. 60, March, 1924.

This species resembles *E. corni* Rob., but may usually be distinguished by the narrower markings on vertex and pronotum which lack the fuscous suffusion. The pronotal Y-shaped mark is usually more evident. The pygofer hook will separate it from the other species except *E. rubrella,* from which it can be distinguished by the very narrow aedeagus in dorsal view. This is a widespread species both in the United States and Canada.

38. *Erythroneura aza* Robinson

Erythroneura aza Robinson, Wm., Can. Ent., vol. 56, No. 12, p. 291; 1924.

Original description. "Ground color of vertex, pronotum and scutellum ivory, of tegmina white, with following marks in orange; vertex, a narrow median inverted U-shaped vitta; pronotum, a broad median Y-shaped vitta and a broad lateral vitta behind each eye; scutellum, a broad spot in each basal angle and a small spot at tip. Tegmina lightly washed with orange throughout except at inner basal angle of clavus and in base of corium, where the orange is deepened to nearly red. Cross veins and adjacent parts of longitudinal veins crimson. A black streak caudad of costal plaque; apical cells whitish at base, remainder dusky, especially near the base. A black spot in apex of cells R_3 and base of cell M_4."

This species resembles *E. delicata* McAtee, but may be separated from that species by a more hyaline appearance, the red or orange markings larger and heavier and the posterior point of style half as long as base.

Genitalia. Pygofer hook typically U-shaped. Foot of style medium sized; heel medium; base straight; anterior point about as long as width of foot at narrowest place, outer face convex, rather wide at base; posterior point sharp and narrow, about half as long

as base. Aedeagus in dorsoventral view almost three pronged, two laterals almost retrorse at tip.

Known from the types from Lawrence, Kansas, and three additional male specimens, one each from Douglas county and Leavenworth county, Kansas, and one from Natchitoches, La.

39. *Erythroneura rubra* (Gill)

Typhlocyba comes var. *rubra* Gillette, C. P., Am. Typholocybinae, 1898, p. 764.
Erythroneura irrorata Robinson, Wm., Can. Ent., vol. LVI, No. 7, p. 154; 1924.

This red-marked species resembles the dogwood series and is often found confused with them in collections. It may easily be separated from them by always having the mesal longitudinal line of vertex light colored instead of dark as in the dogwood series.

Widely distributed throughout the eastern two thirds of the United States and Canada.

Type in the United States National Museum.

40. *Erythroneura festiva* n. sp.

Resembling *E. rubra* Gill., but can be separated by the smaller size, the much narrower color marks, by anterior point of style as long as foot and aedeagus in dorsoventral view quadrangular, tube not protruding.

Ground color semihyaline to whitish with coppery colored marks more or less clouded with fumose. Vertex copper colored except mesal, longitudinal keyhole-shaped spot, circular spot either side of this near base and a narrow spot on lateral margin between apex and eye. Pronotum with median Y-shaped spot with very short base, and two lateral stripes coppery. Scutellum red, except basal angles yellow and mesal white bar with end knobbed near apex; clavus with basal anchor-shaped mark and apical spot red. Corium with red basal dash and irregular-sided mark surrounding costal plaque, touching claval suture in two places and ending at cross veins near base of cell M_4. Costal plaque with black basal dash. Apical cells more or less infuscated. Veins whitish. Venter quite dark.

Genitalia. Foot of style small; posterior point as long as base; anterior short and sharp. Aedeagus in ventral view almost rectangular, apically incised either side of orifice with pair of ventral processes extending slightly beyond apex. Pygofer hook of usual *comes* type.

Holotype male and allotype female, White county, Illinois, March 31, 1929, R. H. Beamer.

Paratypes as follows: 11 males and 3 females, Colfax, La., December 23, 1931, R. H. Beamer; 1 male and 1 female, Clearwater, La., December 21, 1931, R. H. Beamer; 4 males and 2 females, Cherokee county, Kansas, December 17, 1930, R. H. Beamer; 1, Fouke, Ark., December 21, 1931, R. H. Beamer; 1 female, Coal Creek, Tenn., August 27, 1930, R. H. Beamer; numerous males and females from White, Clay, and Gallatin counties, Illinois, collected in March, 1929, by P. W. Oman and R. H. Beamer.

41. *Erythroneura compta* McAtee

Erythroneura comes var. *compta* McAtee, W. L., Trans. Am. Ent. Soc., XLVI, p. 318; 1920.

Erythroneura cherokee Robinson, Wm., Canl. Ent., vol. LVI, p. 154; 1924.

Erythroneura nigroscuta Johnson, Dorothy M., Ohio Jr. of Sci., vol. XXXIV, No. 4, p. 258; 1934.

Resembling *E. delicata* var. *accepta* McAtee, but pink markings heavier, white background not so striking, scutellum usually with dark markings, posterior point of style longer than foot and processes of aedeagus bifid.

General ground color yellowish-white. Red inverted V of vertex rather narrow, branched even with anterior edge of eye, encircling light spots between eyes and main arms of V, continued across pronotum to unite on posterior margin. Pronotum with an additional red strip on lateral margin. Scutellum mostly dark, extreme lateral angles and spot near center light. Clavus with usual anchor-shaped spot at base and smaller one at tip red, basal spot more or less blackened at tip. Corium with red oblique dash on costa midway to costal plaque, another red stripe arising on costa at anterior end of plaque, almost surrounding it, connected to the claval suture between its two spots and ending in the base of cell M_4. Cross veins red, margined on outside with hyaline, which is in turn margined with fuscous. Black spot in posterior margin of costal plaque and apex of cell R_3. Ventral surface stramineous more or less suffused with pink.

Genitalia. Pygofer hook U-shaped with outer fork about same thickness as inner but about a third shorter. Foot of style of medium size; heel prominent; base almost straight; posterior point about one half as long again as base of foot; anterior point short and sharp, about half as long as toe is wide. Aedeagus in dorsoventral view bell-shaped, processes bifid almost entire length, reaching to tip of shaft.

Type. Female, Plummer's Island, Md., March 28, 1915. For some reason McAtee did not name an allotype, therefore the male

paratype, Plummer's Island, Md., Dec. 21, 1915, described above, is so designated.

This is a very abundant species in the United States on grape east of the Rocky Mountains.

Erythroneura compta var. *rufomaculata* McAtee

Erythroneura comes var. *rufomacultata* McAtee, W. L., Bul. Ill. Nat. Hist. Sur., April, 1924, p. 43.

Dissections of the male genitalia of this form reveal no differences from *E. compta*. Summer specimens of the right age usually have the red marking as indicated in the original description.

42. *Erythroneura comes* (Say)

Tettigonia comes Say, Thomas, Ins. Jour. Ac. Nat. Sci. Phila., LV, p. 343; 1825.

General ground color yellowish-white, marked with orange. Vertex with inverted U-shaped mark with lateral extensions enclosing white spots next each eye. U mark continued on pronotum as Y-shaped vitta reaching posterior margin, an additional vitta on each lateral margin. Scutellum with basal angles yellow often bordered with orange, tip orange. Clavus with usual basal anchor-shaped spot and a much smaller one at tip. Corium with angular dash on costal margin near base, another vitta arising on costa at anterior end of costal plaque enlarging to meet claval suture near its middle, almost surrounding plaque, then angling to end in base of cell M_4. Cross veins usually pink, apical cells more or less infuscated. Black spots in posterior end of costal plaque, base of cell M_4 and in apex of R_3.

Genitalia. Pygofer hook of the U type, outer process about two thirds as long as inner. Style with large foot; heel marked; base straight; anterior point short, fairly sharp; posterior point longer than foot, sides almost parallel, usually slightly sinuate. Aedeagus in dorsoventral view oval, very broad, apex almost straight; processes longer than shaft, diverging on outer third with a distinct notch or tooth on their margin near middle.

This notch is the distinctive character of this species.

Since the types of this species are lost the male specimen described above, Leavenworth county, Kansas, April 11, 1930, is designated neotype.

This is a very common species on grape throughout the United States east of the Rocky Mountains.

43. *Erythroneura tacita* n. sp.

Resembling *Erythroneura nudata* McA. in the narrow markings, but larger; posterior point of style almost absent; pygofer hook single and aedeagus very long and narrow with bifid tip.

General ground color whitish, marked with orange. Vertex with median longitudinal band often enclosing two long white areas, continued across pronotum enclosing a white arc on anterior margin. Pronotum with lateral orange bar not reaching posterior margin. Clavus with usual anchor-shaped mark and small mesal spot just before tip. Corium with orange dash at base, another surrounding costal plaque connected to claval suture slightly beyond middle and ending on Cu before cross veins. Cross veins red. Black spot in posterior end of costal plaque and another at base of cell M_4. Venter stramineous, mesosternum dark.

Genitalia. Pygofer hook single, U-shaped, heavy at base. Foot of medium size; almost no heel or posterior point; anterior point long, less than right angle. Aedeagus in ventral view with flattened bifid tip, pair of heavy diverging processes at base, and between basal processes and shaft proper a curved, flattened, enlarged area.

Holotype, male, allotype, female, 15 male and 10 female paratypes, Republic, Wash., August 6, 1931, R. H. Beamer; 6 female paratypes, Oliver, B. C., August 6, 1931, R. H. Beamer; 1 male, Meritt, B. C., and 1 male, Dixie, Ore.; 17 females and 11 males, Poudre river, Colo., Aug. 22, 1931, R. H. Beamer.

The specimens were swept from *Cornus* sp.

44. *Erythroneura gilensis* Beamer

Erythroneura gilensis Beamer, R. H., Annals Ent. Soc. Am., vol. 22, p. 123, 1929.

This species is very close to *E. beameri* Rob., but may be separated from it by its larger size, by narrower, more broken markings and by the processes of aedeagus not diverging at so great an angle.

A fairly common species on grape in Arizona.

Erythroneura octonotata Walsh

Erythroneura octonotata Walsh, B. D., Prair. Farm., Sept. 6, 1862, p. 149.

The original description follows: "Whitish. Head as in the preceding. (*ziczac.*) Thorax a little clouded with fuscous. Abdominal and ventral joints, in mature specimens dusky except at tip. Tips of tarsi dusky. Elytra whitish subhyaline, with the same three spots as the preceding, and in addition, one on the inner

margin not far from the base; on the cross veins an irregular fuscous band, and on the disk a small brown cloud, often obsolete. Length, a little over one tenth inch."

I have not been able to place the species that Walsh must have had when he wrote the above description. It fits almost equally well either of the two species which are known in this paper as *Erythroneura compta* McAtee and *E. delicata* var. *accepta* McAtee, but in both of these there are always orange marks on the tegmen and in the first, black marks on the scutellum. When one considers the description of the color of *E. ziczac* which immediately precedes that of *E. octonotata,* I feel convinced that he would not have omitted these marks.

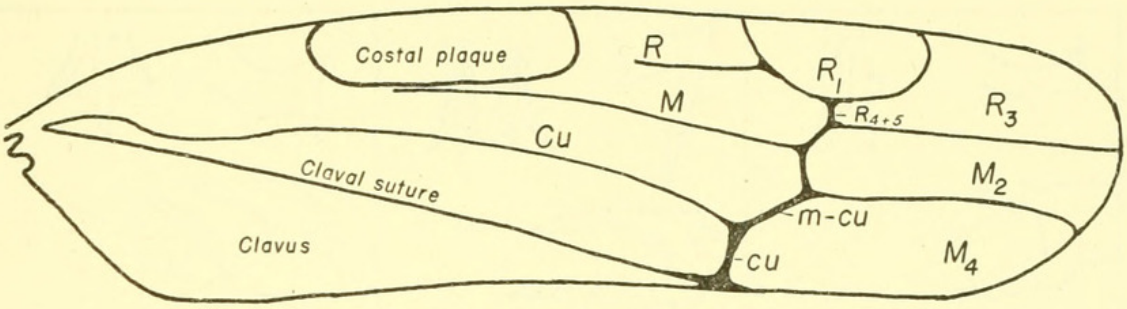
INDEX TO SPECIES

accepta 287
aclys 274
acuticephala 272
amanda 265
ancora 285
anfracta 280
attenuata 284
aza 289
beameri 285
bidens 287
bistrata 267
breakeyi 279
caetra 281
calycula 270
cancellata 273
cherokee 291
coloradensis 277
comes 292
complementa 269
compta 291
corni 287
corona 267
cymbium 271
delicata 286
disjuncta 272
diva 269
elegans 273
elegantula 277
erasa 270
festiva 290
flava 266
fraxa 272
gilensis 293
infuscata 265
irrorata 290
integra 271
kanwakae 279
lacta 286
nigroscuta 291
noncincta 270
nudata 284
octonotata 293
omaska 286
ontari 289
ornata 287
palimpsesta 278
pontifex 279
portea 283
prima 283
prosata 275
reflecta 283
repetita 282
rosa 282
rubra 290
rubranotum 268
rubravittata 269
rubrella 288
rufomaculata 292
scripta 287
stricta 268
suffusa 287
tacita 293
tricincta 268
tudella 287
vaga 285
venusta 266
vitifex 280
vitis 266
walshi 276
ziczac 275

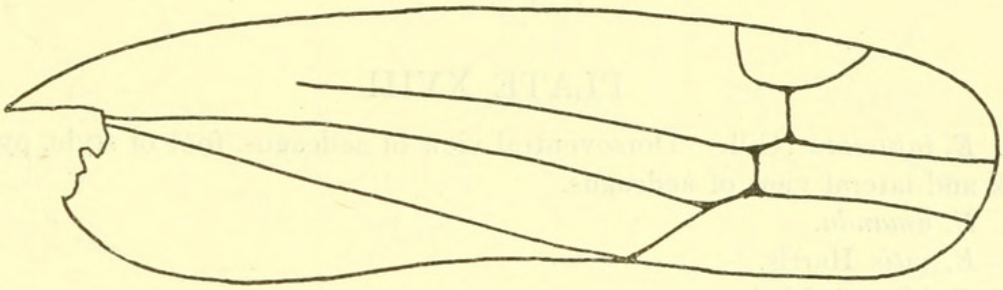
PLATE XVII

Wing venation of the four groups of Erythroneura.

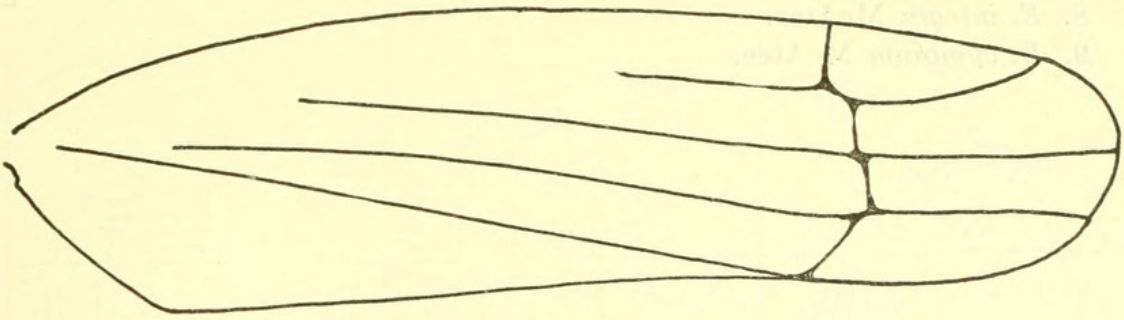
PLATE XVII



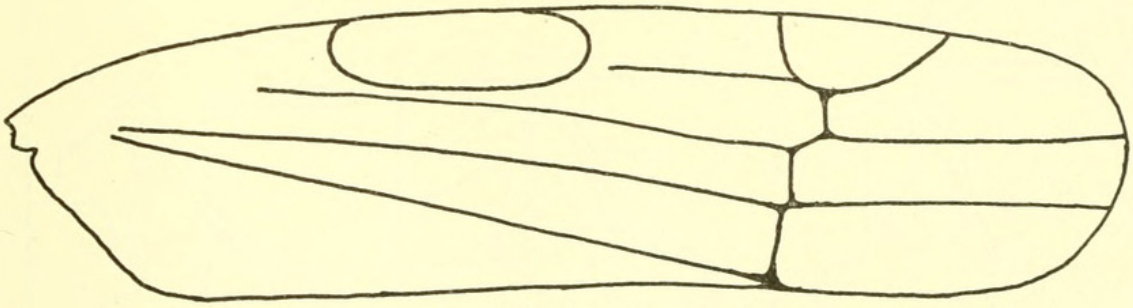
VULNERATA GROUP



OBLIQUA GROUP



MACULATA GROUP



COMES GROUP

PLATE XVIII

1. *E. infuscata* (Gill.) Dorsoventral view of aedeagus, foot of style, pygofer hook and lateral view of aedeagus.
2. *E. amanda.*
3. *E. vitis* Harris.
4. *E. bistrata* McAtee.
5. *E. tricincta* Fitch.
6. *E. diva* McAtee.
7. *E. calycula* McAtee.
8. *E. integra* McAtee.
9. *E. cymbium* McAtee.

PLATE XVIII

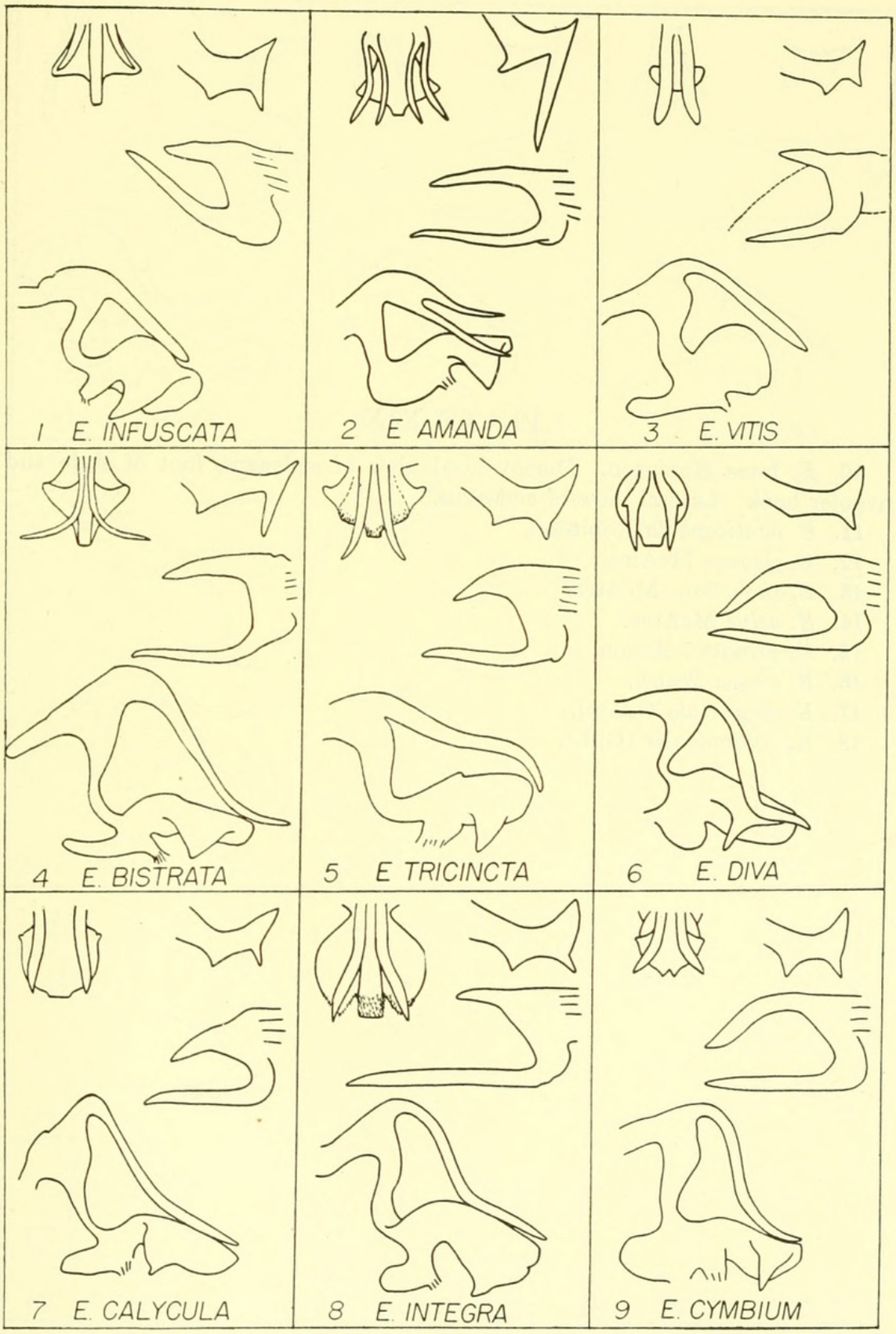

1 E. INFUSCATA
2 E AMANDA
3 E. VITIS
4 E. BISTRATA
5 E TRICINCTA
6 E. DIVA
7 E. CALYCULA
8 E. INTEGRA
9 E. CYMBIUM

PLATE XIX

10. *E. fraxa* Robinson. Dorsoventral view of aedeagus, foot of style and pygofer hook. Lateral view of aedeagus.
11. *E. acuticephala* Robinson.
12. *E. elegans* McAtee.
13. *E. cancellata* McAtee.
14. *E. aclys* McAtee.
15. *E. prosata* Johnson.
16. *E. ziczac* Walsh.
17. *E. elegantula* Osborn.
18. *E. coloradensis* (Gill.).

PLATE XIX

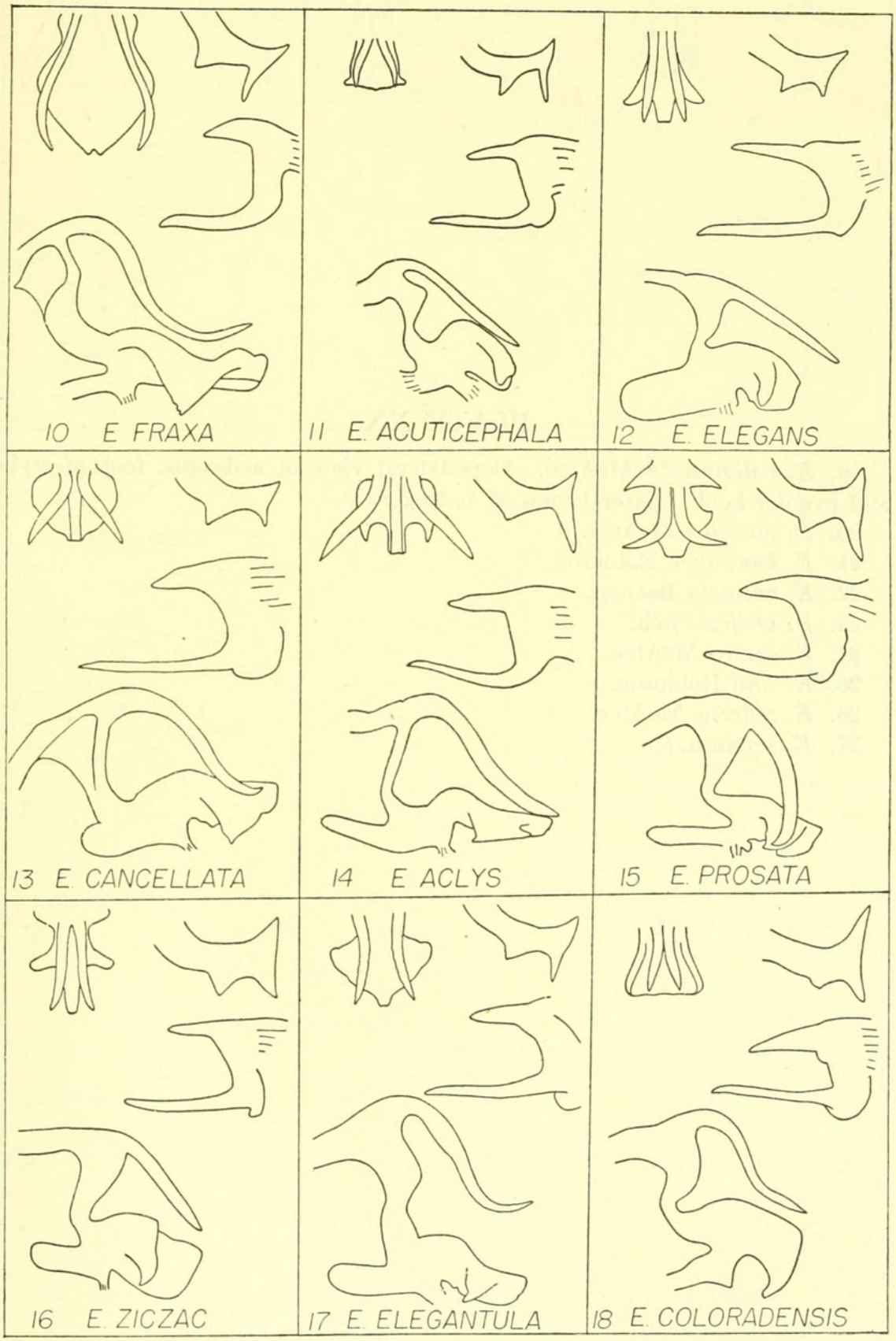

10 E FRAXA
11 E. ACUTICEPHALA
12 E. ELEGANS
13 E. CANCELLATA
14 E ACLYS
15 E. PROSATA
16 E. ZICZAC
17 E. ELEGANTULA
18 E. COLORADENSIS

PLATE XX

19. *E. palimpsesta* McAtee. Dorsolateral view of aedeagus, foot of style and pygofer hook. Lateral view of aedeagus.
20. *E. pontifex* McAtee.
21. *E. kanwakae* Robinson.
22. *E. anfracta* Beamer.
23. *E. vitifex* Fitch.
24. *E. caetra* McAtee.
25. *E. rosa* Robinson.
26. *E. reflecta* McAtee.
27. *E. prima* n. sp.

PLATE XX

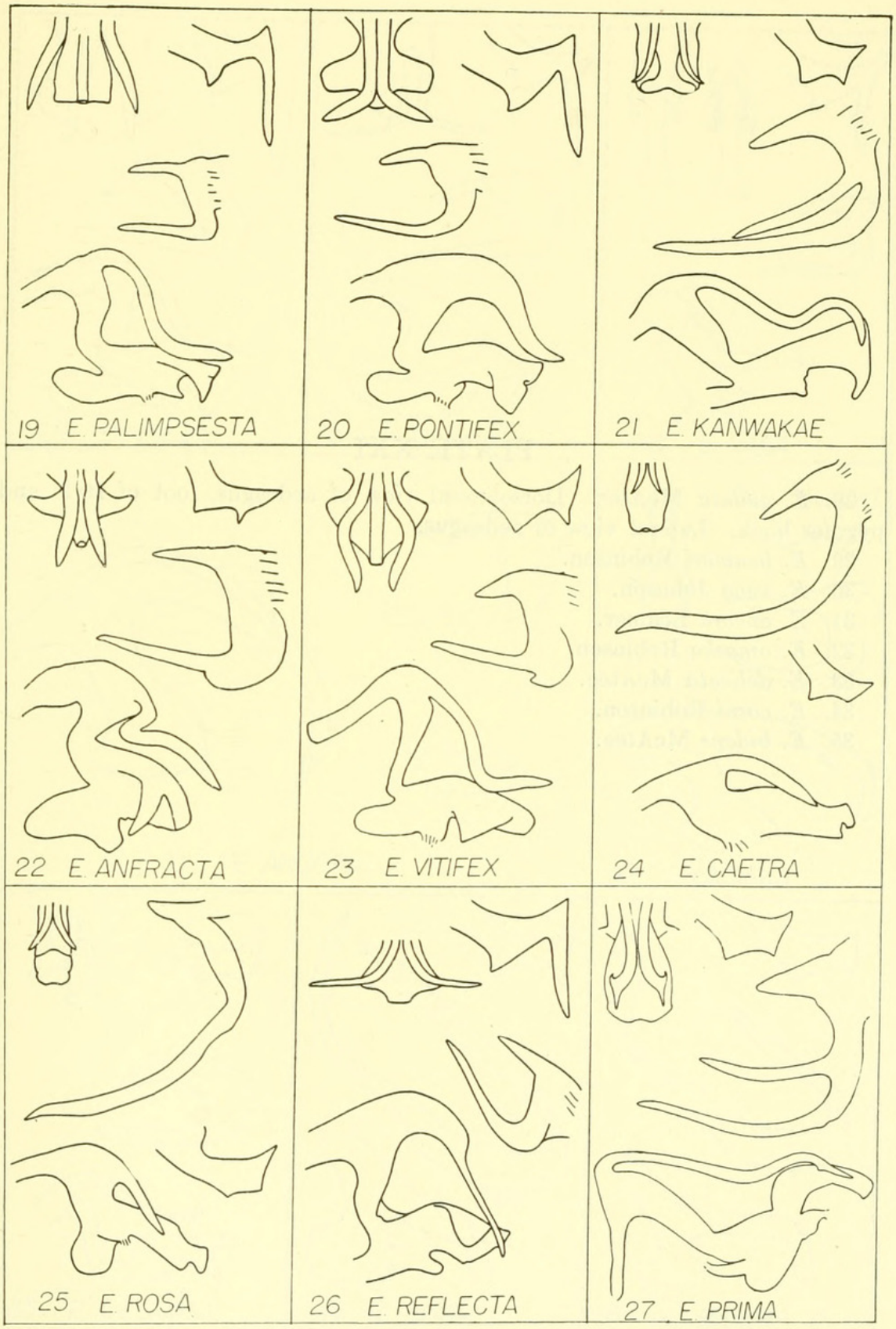

19 E. PALIMPSESTA
20 E. PONTIFEX
21 E. KANWAKAE
22 E. ANFRACTA
23 E. VITIFEX
24 E. CAETRA
25 E. ROSA
26 E. REFLECTA
27 E. PRIMA

PLATE XXI

28. *E. nudata* McAtee. Dorsolateral view of aedeagus, foot of style and pygofer hook. Lateral view of aedeagus.
29. *E. beameri* Robinson.
30. *E. vaga* Johnson.
31. E. *ancora* Beamer.
32. *E. omaska* Robinson.
33. *E. delicata* McAtee.
34. *E. corni* Robinson.
35. *E. bidens* McAtee.

PLATE XXI

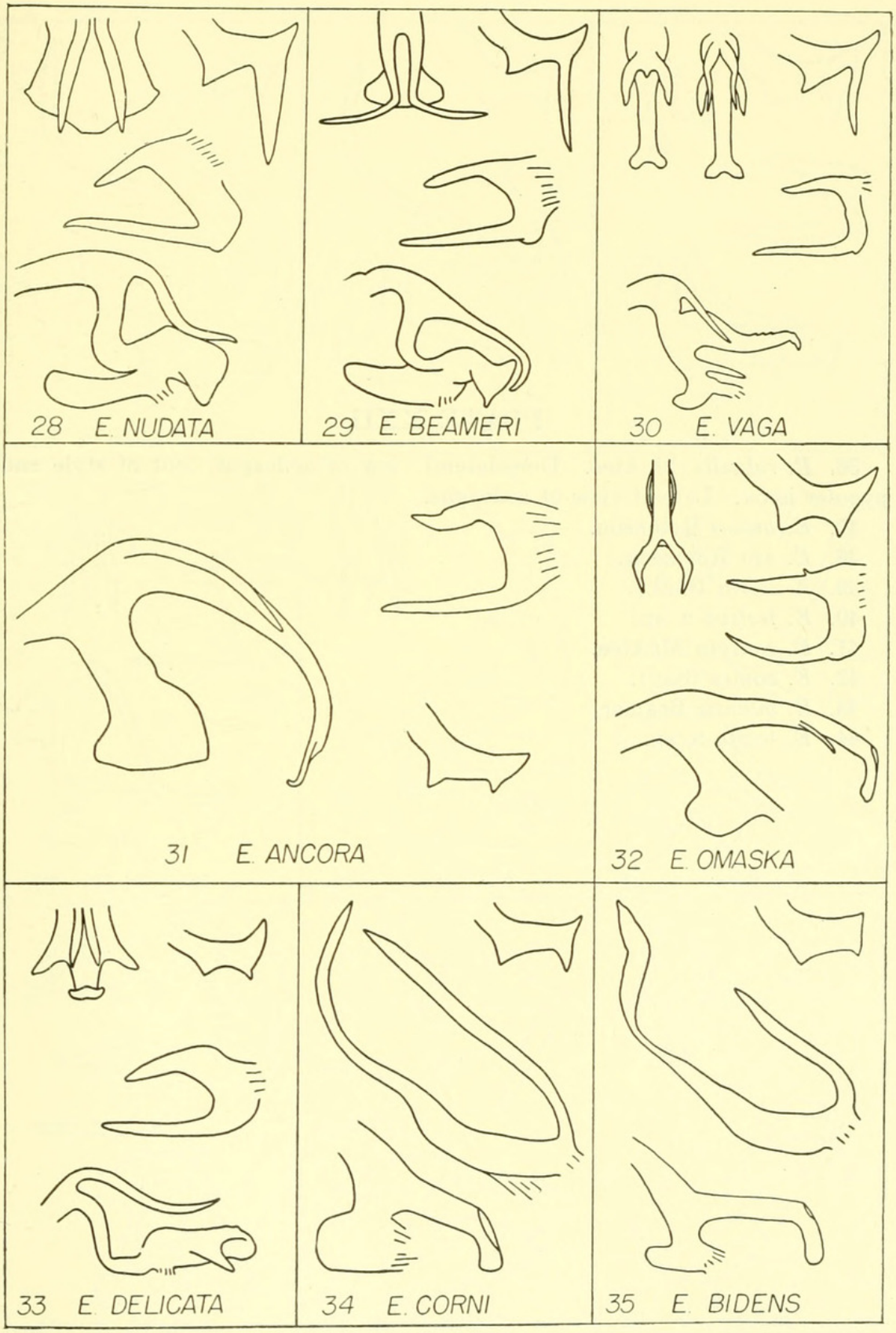
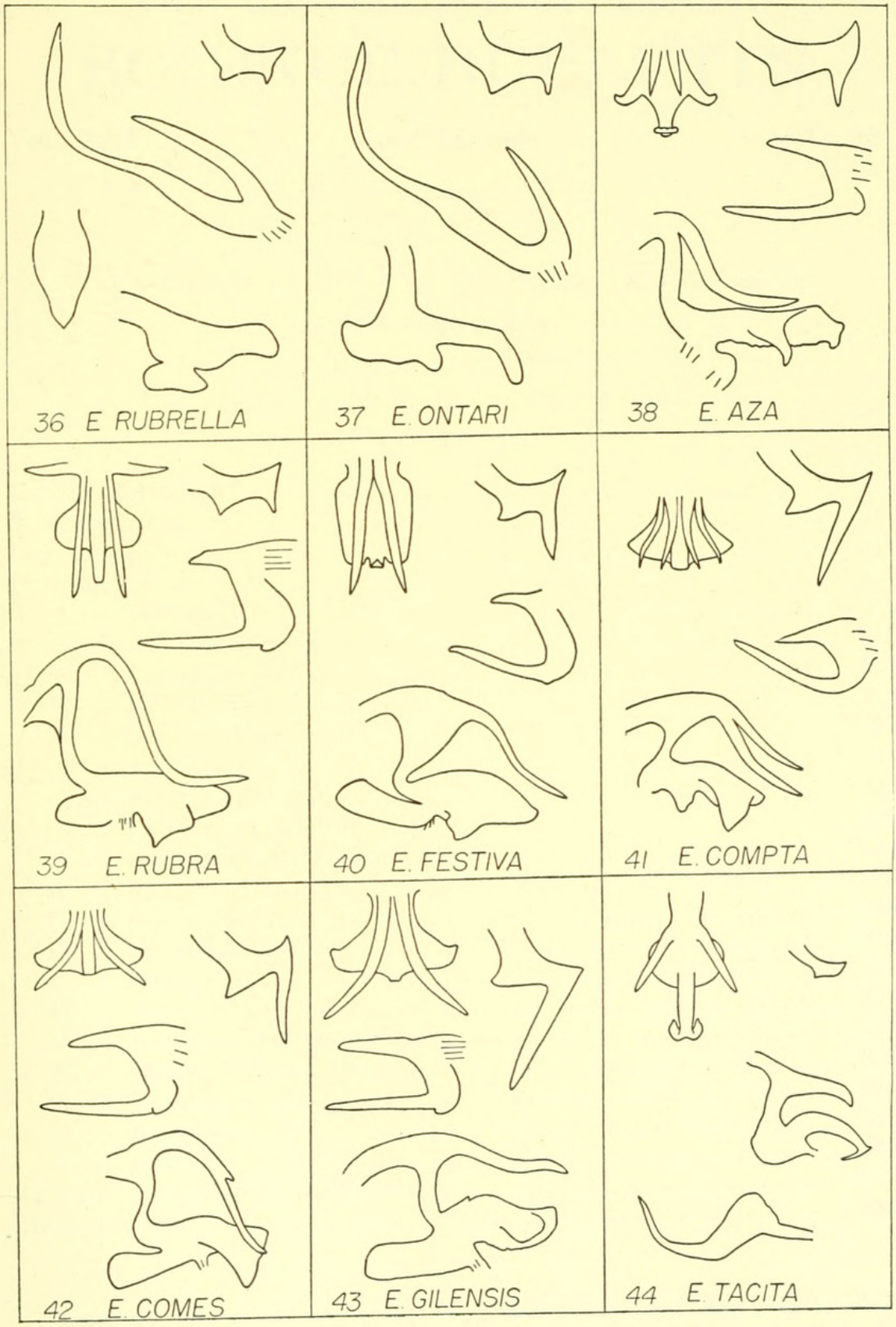

28 E. NUDATA
29 E. BEAMERI
30 E. VAGA
31 E. ANCORA
32 E. OMASKA
33 E. DELICATA
34 E. CORNI
35 E. BIDENS

PLATE XXII

36. *E. rubrella* McAtee. Dorsolateral view of aedeagus, foot of style and pygofer hook. Lateral view of aedeagus.
37. *E. ontari* Robinson.
38. *E. aza* Robinson.
39. *E. rubra* (Gill.).
40. *E. festiva* n. sp.
41. *E. compta* McAtee.
42. *E. comes* (Say).
43. *E. gilensis* Beamer.
44. *E. tacita* n. sp.

PLATE XXII


36 E RUBRELLA
37 E. ONTARI
38 E. AZA
39 E. RUBRA
40 E. FESTIVA
41 E. COMPTA
42 E. COMES
43 E. GILENSIS
44 E. TACITA

Beamer, R. H. 1938. "Species of Erythroneura of the comes group (Homoptera - Cicadellidae)." *The University of Kansas science bulletin* 24(14), 261–307.

View This Item Online: https://www.biodiversitylibrary.org/item/25856
Permalink: https://www.biodiversitylibrary.org/partpdf/33501

Holding Institution
Harvard University, Museum of Comparative Zoology, Ernst Mayr Library

Sponsored by
Harvard University, Museum of Comparative Zoology, Ernst Mayr Library

Copyright & Reuse
Copyright Status: In copyright. Digitized with the permission of the rights holder.
Rights Holder: KU Biodiversity Institute and Natural History Museum
License: http://creativecommons.org/licenses/by-nc-sa/3.0/
Rights: https://biodiversitylibrary.org/permissions

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at https://www.biodiversitylibrary.org.

This file was generated 9 May 2024 at 19:47 UTC