

SOME ERYTHRONEURA OF THE COMES GROUP
(HOMOPTERA: CICADELLIDAE)

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During a study of the *Erythroneura* of the *Comes* Group, chiefly from Ohio, several undescribed species and varieties were found. An examination of the inner male genitalia of previously described forms indicated in a few cases, need for a change in status.

Types of the species here described are placed in the collections of the Ohio Biological Survey and of Professor Herbert Osborn under whose direction this work was done.

Erythroneura nigroscuta n. sp.

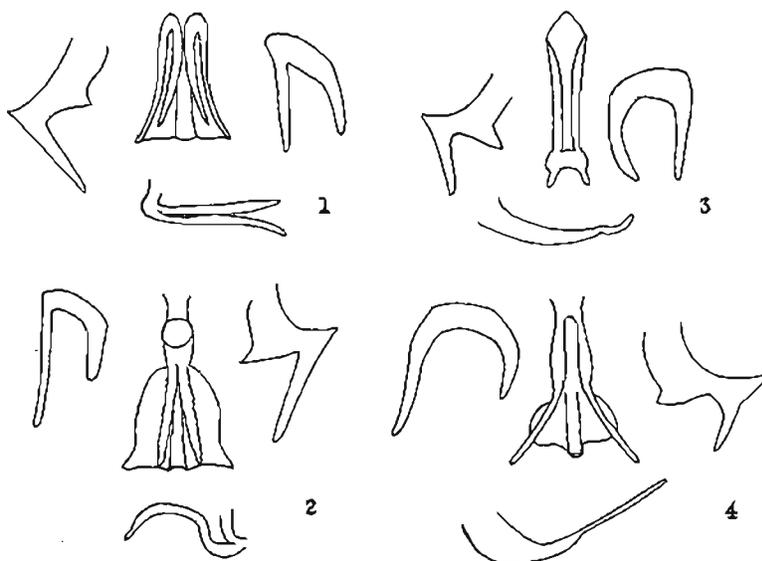
(Fig. 1)

Ground color of vertex, pronotum and scutellum yellowish white, of elytra whitish semihyaline, with red to yellow color markings. Vertex, a median inverted U-shaped vitta with lateral extensions to eyes at half its length; pronotum, U-shaped median pellucid vitta with very heavy base, the arms not reaching anterior margin, area between arms and on either side pale, a broad vitta behind either eye, sometimes entire posterior half of pronotum yellow; scutellum, basal angles yellow, median basal area black, apex black, a thin yellow transverse streak between apex and median dark basal part. Elytra: clavus, in basal half an elongate vitta, swollen at tip to meet tegminal suture where it includes a large oval black spot, a spot at apex; corium, an oblique streak near base, another arising before costal plaque, bordering inner margin of plaque to apex, thence to base of cell M_4 , area posterior to hyaline plaque washed with color. In some specimens the elytra appear entirely yellow before the apex but for the dark claval spot and hyaline plaque. Crossveins and adjacent part of longitudinal veins agree in color with vittae; hyaline area just posterior to crossveins followed by dusky apices; a large black spot in base of cell M_4 and one in apex of R_2 , and irregular black dash at apex of costal plaque. Below creamy white to dirty white, but for dark-tipped ovipositor and dark apices of plates in male. Disc of first three abdominal segments dusky dorsally.

Inner male genitalia: Style, heel slightly less than a right angle, base straight, anterior point a right angle, posterior point one-third longer than base of foot, forming less than a right angle with and rounded to base; oedagus triangular apically, transverse at tip, with pair of double processes, the inner parts parallel and slightly swollen apically, the outer longer, more slender and diverging apically; pygofer hook with points of about equal length.

This species resembles *Erythroneura comes* var. *compla* from which it may be distinguished by the different inner male genitalia, the definite black markings of the scutellum and clavus, and the rather indefinite color markings. In var. *compla* the dark markings are less definite, while the color markings are distinct and of the *comes* type.

Holotype (male), Kelly's Island, Ohio, July 16, 1920, C. I. Bliss, and two females, allotype and paratype, same data; paratypes, two, Adams Co., Sept. 1, 1931, E. P. Breakey,



Inner Male Genitalia, *Erythroneura* of the Comes Group.

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| 1. <i>Erythroneura nigroscuta</i> n. sp. | 3. <i>Erythroneura vaga</i> n. sp. |
| 2. <i>Erythroneura attenuata</i> n. sp. | 4. <i>Erythroneura bistrata</i> McAtee. |

on *Vitis* and *Malus*; one, Rock House, Hocking Co., Sept. 17, 1933, D. M. Johnson; and other specimens from Ohio—Adams Co., Sept. 1, 1931, E. P. Breakey, *Vitis*; Columbus, March 3, 1901, H. Osborn; Ashley, August 1, 1920; Knox Co., May 8, 1933, D. M. Johnson, *Carpinus*. Four specimens from Dune Park, Indiana, Sept. 12, 1931, are included here.

Erythroneura nigroscuta var. *rufomaculata* McAtee

Erythroneura comes var. *rufomaculata* McAtee, Bul. Div. Nat. Hist. Surv., Ill., 1924, xv, p. 43.

Differing from the species in that the vittae of the basal part of the elytra are bright red, while those of the posterior part are pale yellow.

Twelve specimens, Haunck's Pond, Middle Bass Island, Ohio, July 22, 1933, M. Auten and D. M. Johnson; one South Bass Island, Ohio, Aug. 3, 1920, C. I. Bliss; and one Dune Park, Ind., Sept. 12, 1931, E. P. Breakey.

Erythroneura attenuata n. sp.

(Fig. 2)

Ground color opaque white, color markings bright red to orange. Vertex, narrow median inverted orange U with lateral arms connecting with narrow vitta bordering eye; pronotum, median Y with very thin arms, not reaching anterior margin, narrow streak behind either eye; scutellum, basal angles yellow, red-margined outside, and tip red; elytra, anchor-shaped vitta of clavus very thin, a small spot at apex, corium with thin stripe near base, another at base of costal plaque widening at side of plaque with an arm extending forward to meet base of claval anchor, the part of vitta near plaque is pale interiorly, a second arm extends to tip of clavus and thence to base of cell M₄. Black line at apex of plaque very thin, and usual spots of apical cells very small; crossveins red, longitudinal veins of apex pale, cells smoky except for part bordering crossveins, which is pale. Below entirely pale yellowish; ovipositor in female black-tipped, male plates pale and appressed, dorsum of abdomen dark discally.

Inner male genitalia: Style, posterior point as long as base of foot and at less than a right angle to it, anterior point sharp, less than right angle; oedagus bell-shaped, processes thick, rough, parallel and not exceeding the oedagus when viewed ventrally, in lateral view curved dorsally at tip; hook, interior point short, thick, exterior thin, and twice as long, base half as long as outer point and meeting it at about a 45° angle.

Holotype, female, Cantwell Cliffs, Hocking Co., Ohio, Oct. 23, 1932, D. M. Johnson; allotype, male, same data; and paratypes, three Adams Co., Sept. 1, 1931, E. P. Breakey, *Vitis*; one Richland Co., May 8, 1933, M. Auten. Other Ohio specimens are from the above localities and from Athens, Sept. 11, 1920, H. Osborn; Knox Co., May 8, 1933, *Carpinus*, M. Auten and D. M. Johnson; and Williams Co., Sept. 5, 1931, E. P. Breakey.

As the color markings are discontinuous, this species may be considered as rather close to *E. comes*.

Erythroneura vaga n. sp.

(Fig. 3)

Ground color of vertex, pronotum and scutellum white, of elytra semihyaline; markings vague, orange. Traces of vittae of vertex and pronotum present in usual *comes* pattern; scutellum, angles yellow, median vitta white; elytral vittae narrow, continuous from above

middle of humeri with projection to commissure at middle of clavus, diagonally back to middle of costal plaque, thence to base of cell M_4 ; a spot at apex of clavus; corium, an oblique streak at base, another bordering the plaque narrowly and joining continuous vitta; crossveins red; apical cells dusky; usual black spots small and streak at apex of plaque very narrow.

Inner male genitalia: Style, heel large, anterior point a right angle, posterior point equal in length to base of foot, narrow, curved to base at less than right angle; oedagus a narrow shaft with two short prongs at slightly enlarged apex, no processes, in lateral view, prongs turned up; pygofer hook with points about equal and tips approaching one another.

Two specimens, male (holotype) and paratype (abdomen missing), Mineral Springs, Ohio, August 31, 1931, H. Osborn.

Erythroneura tricincta var. *noncincta* n. var.

There are no true crossbands in this variety which is closely related to *Erythroneura tricincta* var. *calycula*, as the basal angles of the 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 color streaks follow the longitudinal veins of the elytra. The crossveins are narrowly black, heavily margined anteriorly, except the fourth, with bright red; apical cells dusky.

Described from one female (holotype). Adams Co., Ohio, Sept. 1, 1931, E. P. Breakey; *Vitis*; and one female (paratype). Rotten Wood Creek, Georgia, Oct. 1, 1933, M. Auten.

Erythroneura breakeyi n. sp.

Ground color creamy white. Vertex, basal half except for narrow streak next each eye black, and median extension almost to border, about half of width at base, slightly divided apically; pronotum, median Y-shaped vitta thick, with arms and base of about equal length and thickness, pellucid orange, an orange mark behind each eye in anterior half; scutellum, basal angles large, orange, tip orange, median vitta creamy white, slightly wider at apex, forming inverted T; elytra, a broad reddish brown red-bordered vitta continuous from mid-humerus, bordering costal plaque and extending to base of cell M_4 . In clavus the first fourth occupied by vitta half its width, in second fourth widened to tegminal suture. Apex of clavus colored, forming a triangle when elytra are closed with a subcircular pale spot anteriorly and on either side and posteriorly a pale longitudinal area. In the corium there is a small oblique dash at base and one bordering costal plaque anteriorly, which joins main vitta. The anterior half of plaque chalky white and posterior dusty black; crossveins except the fourth, which is pale, and adjacent longitudinal veins, are bright red; apical cells smoky except near crossveins; a very small black spot in apex of R_3 and rather

indefinite dark blotch in base of cell M_4 . Below yellowish white, a faint red streak above each antenna; ovipositor dark-tipped and sides of pygofer dark, except pale stripes bordering ovipositor, which are set sparsely with pale hairs.

Described from one female (holotype), Adams Co., Ohio, Sept. 1, 1931, E. P. Breakey, *Vitis*, and a female (paratype), "Mtn. Grove, Mo., 7-7-15, Horsfall." In the latter, the pronotum is immaculate, tip of scutellum pale, and elytral vittae pale orange basally and bright red discally; below entirely pale.

Erythroneura bistrata McAtee

(Fig. 4)

Erythroneura vitis var. *bistrata* McAtee, Trans. Am. Ent. Soc., xlvii, p. 305, 1920.

The difference in the inner male genitalia as well as in the color pattern separate this form from *vitis* and make it of specific rank.

Vertex pale yellow anteriorly with a median red area almost attaining margin and laterally widened at about half its length to eyes which are narrowly yellow-margined. Pronotum entirely reddish brown but for small yellow spot at middle of anterior margin. Scutellum, base brownish red, with narrow pale median vitta; apex yellow. Elytra red but for costal plaque, an area at inner base of clavus extending on to corium, spot involving apex of clavus and adjoining corium, and very small dots anterior to two center crossveins; apex smoky. Below pale yellow, the metathorax dark and abdomen dirty yellow; ovipositor black-tipped; first three abdominal segments dark dorsally, also pygofer, ovipositor and last ventral segment suffused with red in some cases, otherwise pellucid yellow. In male the tips of the plates are dark.

Inner male genitalia: Style, heel small, base straight half way then curved to posterior point, joining it at a little less than a right angle; posterior point not quite as long as base of foot, blunt; anterior point half as long as posterior, sharp. Oedagus triangular apically, with rounded angles and produced medianly; processes thick and parallel for basal half, then narrower and diverging gradually, extending beyond apex of oedagus; pygofer hook large, outer point about a third longer than inner, and narrow.

Specimens from Columbus, Ohio include the following data: July 22, 1921 and July 28, 1928, H. O.; April 29, 1933, M. Auten and D. M. Johnson, on *Aesculus*; May 11, 1933, M. Auten, *Aesculus*; O. S. U. Campus, July 28, 1933, D. M. Johnson, on *Cercis*; and a specimen from Williams Co., Ohio, Sept. 5, 1931, E. P. Breakey.

Erythroneura bistrata var. *stricta* McAtee

Erythroneura vitis var. *stricta* McAtee, Trans. Am. Ent. Soc. xlvii, p. 305, 1920.

The inner male genitalia are identical with those of *E. bistrata* and the color markings less extensive.

Ground color creamy white; vertex chiefly yellow with touches of red near posterior margin; pronotum reddish brown but for one or more pale spots at anterior margin; scutellum reddish brown basally with paler narrow median vitta, and pale tip; tegmen with three cross-bands, anterior red, margin not exceeding scutellum, middle red, occupying central third of clavus and extending transversely to costal plaque which is black for more than half its length; apex dusky; cross-veins red, the areas between them anterior to central cells washed with red. Below same as in *bistrata*.

Collected in Columbus, Ohio, July 28, 1933, *Cercis*, D. M. Johnson; July 28, 1928, H. Osborn; July 27, 1921, H. Osborn; May 11, 1933, *Aesculus*, M. Auten; and Williams Co., Ohio, Sept. 5, 1931, E. P. Breakey.

BOOK NOTICES

Endocrine Chemistry.

This very practical volume deals with the preparation and chemical composition of the hormones. No more promising branch of biology exists than endocrinology, and no more fundamental portion of endocrinology can be conceived of than the isolation, analysis, and synthesis of the internal secretions. The physiological and clinical properties of these substances, while not emphasized, are touched on sufficiently to round out the presentation. The book appears to be very complete, and the style is straightforward and lucid. To the laboratory worker, the clinician, and the experimental biologist, the book will be invaluable.

The Chemistry of the Hormones, by Benjamin Harrow and Carl P. Sherwin. vii + 227 pp. Baltimore, the Williams and Wilkins Co., 1934. \$2.50.

The Biology of Bacteria.

This new text is a complete introduction to the study of bacteriology. The subject is presented as a biological science, with emphasis upon the fundamental problems of morphology, taxonomy, physiology, ecology, heredity and evolution. Practical applications are not unduly stressed, but are inserted where they seem desirable. The relation of the protozoa, fungi, and other forms of microbic life to bacteriology are developed. Numerous illustrations add to the value of the text material.

The Biology of Bacteria, by A. T. Henrici. x+472 pp. Boston, D. C. Heath and Co., 1934. \$3.80.

The Biology of Cells

The third edition of this well-known text presents an up-to-the-minute discussion of the modern cytological viewpoint. It is an excellent presentation, and covers particularly well the recent advances in cyto-genetics. Fragmentation, translocation, segmental interchange, heteroploidy, chiasma formation and other chromosomal phenomena are clearly and adequately discussed. One finds it easier, for example, to digest Darlington's recent interpretations from this presentation than from Darlington's own writings. The volume is profusely illustrated, both with photomicrographs and diagrams. Excellent discussions of the relation of genes and chromosomes to embryology, to sex-determination, and to evolution, round out the book. An exceptionally complete bibliography of nearly one hundred pages is appended.—L. H. S.

Introduction to Cytology, by Lester W. Sharp. (Third edition, revised). xiv+587 pp. New York, the McGraw-Hill Book Co., 1934.