

Thyanta perditor Fabricius(as *Mormidea*) Stahl.

Gundlach. Van Z. (P. R. 705). AMNH at Mayagüez.

Wetmore 16-58, 61, 89: eaten by Mangrove Cuckoo, Ani and Martin.

on weeds (341-17), at Carolina (RTC), at Añasco (1109-13), at Vega Baja (510-16); on *Cleome spinosa* at Cayey (188-16); all stages abundant on *Piriqueta cistoides* Mey. (831-14 det. Gibson).**Podisus sagitta** Fabricius

Gundlach.

(832-14), at Aibonito (SSC — det. McAtee): resting on cotton at Boquerón (35-23)

Podisus sculptus Champion—det. McAtee

on coffee leaves (726-17)

Mutyca grandis Dallas

Van Z. (det. Heidemann).

(one unlabeled specimen — det. McAtee.)

Mutyca phymatophora Palisot de Beauvois

Gundlach. Van Z. (P. R. 710).

Pharypia pulchella Drury

Van Z. (P. R. 112).

SCUTELLERIDÆ.

Pachycoris torridus Scop.—det. Gibson

Smyth, E. G., "Un Insecto Extraño que Cubre su Cría lo Mismo que una Gallina" Rev. Agr. P. R., Vol. 2, No. 4, March 1919, pp. 27-31, pl. 2: (an extraordinary insect which broods her young like a hen).

First instar nymphs are bright red, in following instars metallic green with orange-red dots; adults velvety blue-black with orange-red spots, the four largest on the abdomen often coalescing and in a few individuals extending over nearly the entire abdomen.

on *Croton discolor* and *Lantana involucrata* at Ponce (112-13); on *Croton humilis* at Guánica (135-15), and on this and other species of wild *Croton* at Moca (708-14), Aguadilla (229-22), Hatillo (507-18).**Pachycoris fabricii** Palisot de Beauvois(as *Scutellera nitens* Dallas) Stahl.

Gundlach.

Sphyrocoris obliquus Germar

Gundlach.

Augocoris pallidus Herrich-Schaeffer
(as *Scutellera cretacea* Voct.) Stahl.
Gundlach.
on *Phyllanthus epiphyllanthus* at Bayamón (740-13 det
Gibson).

Diolcus boscii Fabr.—det. H. G. Barber
at Yauco (706-14, 837A-14).

Diolcus irroratus Fabricius—det. McAtee
flying in grapefruit grove at Pueblo Viejo (457-16);
Pt. Cangrejos (GNW).

(**Mesotrypa sinuosa** Uhler MS
Gundlach.)

CYDNIIDÆ.

Amnestus pusillus Uhler
Gundlach. "vuela a menudo hacia las luces encendidas en las
casas."

Rhytidiporus indentatus Uhler—det. McAtee
at light (681-17); at Manatí (597-16).

THYREOCORIDÆ.

Thyreocoris (Corimelaena) minutus Uhler
AMNH at Ponce.
on the ground among weeds at Pt. Cangrejos (GNW det
McAtee).

HOMOPTERA.

CICADIDÆ.

Proarna hilaris Germar
(as *Odopoca* sp.) Van Z. (P. R. 719).
Wetmore 16-57, 59, 63, 69, 77, 80, 82, 96, 98, 106, 114, 116, 119;
eaten by Mangrove Cuckoo, Ground Cuckoo (4.16% of food),
Woodpecker, Owl, Petchary (2.47% of food), Flycatcher,
Kingbird, Vireos, Yellow Warbler, Yellow-Shouldered Black-
bird, Oriole and Mozambique.
at light (136-12 det. Gibson, 692-12, 124-18), at Condado
(66-11, 159-15), at Martín Peña (89-16, 262-16), at Vega
Alta (160-15), at Guánica (407-14, 1136-13 det. McAtee):
resting on sea-grape at Quebradillas (300-21); on grapefruit
at Pt. Salinas (125-15, 179-15); nymphs in sandy soil at
Mameyes (819-12), apparently feeding on roots of *Wedelia*
trilobata at Pt. Salinas (GNW).

Zammara sp.—det. McAtee
(as *Proarna* sp.) Wetmore 16-77, 82: eaten by Kingbird and
Flycatcher.
at light at Aibonito (1305-13); on coffee tree at Lares (481-

21), at Corozal (279-21), in mountains north of Yauco (247-22); nymphs from soil about roots of coffee trees at Añasco (375-12), of other trees (374-12).

MEMBRACIDÆ.

Antianthe expansa Germar—det. Funkhouser

Smyth 20-125: on cotton. Wolcott 23-46: on coffee.

Wolcott 23-46: on coffee.

on tomato (179-16), on *Spondias lutea* (724-16), on *Psidium guajava* (1119-16), on *Cissus sicyoides* (430-21), on mulberry (131-22); on grapefruit (178-16, 559-16, 330-17), at Vega Baja (553-16), at Vega Alta (228-17); on tobacco at Cayey (38-16); on wild Bougainvillea vine at Cayey (354-22); on *Solanum torvum* at Giales (223-22), at Bayamón (508-17); on coffee at Corozal (283-21), at Giales (465-21), at Utuado (477-21); on ganduli, *Cajanus cajan*, at Comercio

Monobelus fasciatus Fabricius—det. Funkhouser

Wolcott 23-46: on coffee.

on *Spondias lutea* (782-16), on *Erythrina glauca* (785-13, 964-16); on *Solycum nigrum* at Vega Baja (532-16); on *Inga laurina* at Lares (638-21, 149-22); on ganduli, *Cajanus cajan*, at Comercio (763-13, 769-13).

CERCOPIDÆ.

Epicranion championi Fowler

Van Z. (608) on coffee and *Inga laurina*.

Van Zwaluwenburg 17-516: "fairly common (on coffee); spittle masses around a berry cluster often contain as many as six nymphs."

on coffee at Lares (129-21); nymphs common on coffee throughout the coffee districts.

Philaenus fusco-varius Stal—det. McAtee

on weeds (734-17), on mulberry (131-22).

CICADELLIDÆ (JASSIDÆ).

Agallia tenella Ball (possibly *A. albidula* Uhler—det. DeLong)

Barrett 04-448; Howard 04-88: injurious to beans, cowpeas and other plants.

Jones 15-2 and 3: correctly quotes other records.

Wolcott 21-19, fig. 5: on sugar cane, in abundance at Garrochales; on *Solanum torvum* and potatoes. Illustration of adult.

on carrots (539-17, 531-17, 686-17), on string beans (206-16), on *Agali grandiflora* (155-21), on weeds (431-17), on grass (450-16, 452-16), on eggplant (448-16); on tobacco (1151-16), at Juncos (157-16); on potatoes at Jajome Alto (21-21); on tobacco at Cayey (21-21); on cotton at Camuy (227-21). All stages on tobacco (591-16).

Agallia pepino sp. nov. DeLong & Wolcott

Bluish-white. Length 2.5 mm. Eyes dark brown with creamy margins. Vertex only slightly broader behind the eyes, with lenticular median piceous spot, and a pair of round piceous spots near the anterior angle of the eyes extending on to the front and an irregular-shaped pair on the posterior margin between the others. Large yellow ocelli ringed with piceous and an inverted Y with arms extending towards bases of the antennae. Anterior margin of pronotum light chestnut, becoming broader and piceous laterally behind the eyes; a pair of large, pear-shaped dull-yellow areas with irregular piceous margins posteriorly; a lenticular piceous median spot and indistinct brownish spots near lateral angles. Scutellum with a pair of piceous spots and the broadened ends of the piceous depression partly under the pronotum. Elytra dull brown, semi-transparent, venation dull bluish-white; a bright bluish-white semicircle connecting the inner and outer sectors of the clavus with the median inner margin.

Genitalia: *Female* last ventral segment rather narrow, one-half longer than preceding segment. Posterior margin rather broadly notched one-fourth the distance to base so as to form two rather broadly rounded lobes. *Male* valve short and broad, convexly rounding. Plates long and narrow, rather broad at base, abruptly constricted before their middle and produced into long narrow acute tips.

From carpet grass, *Axonopus compressus*, at Ciales (64-21 TYPE); on sugar cane at San Sebastián (GNW).

Agallia carrotovora sp. nov. DeLong & Wolcott

Resembling *A. sanguinolenta* Provancher. Dull yellow. Length 3 mm. Vertex of uniform length, with a pair of large oval piceous spots on posterior margin, two closely proximate median lines forming the lower arm of an inverted Y on the front, below which a double series of somewhat irregular transverse black spots extend to black-based clypeus, and in front of eyes an irregular band, with arms extending around the ocelli. Pronotum, differing from *A. sanguinolenta*, thickly dotted with piceous depressions, except at lateral angles, and solidly piceous along median line and in acute triangles on lateral margins surrounding a lenticular clear space behind the eyes. Scutellum black with a large yellow V bordering posterior margins and a pair of dull yellow spots partly under the pronotum. Elytra light brown with dark brown venation, except light yellow areas near base of corium, basal half of sectors of clavus, spots at their margins and a triangle next to the scutellum.

Genitalia: *Female* last ventral segment more than twice as long as preceding. Lateral angles strongly produced, posterior margin concavely excavated half way to base, median third broadly bordered with brown. *Male* valve short, round-

ingly produced. Plates three times as long as last ventral segment, rather broad at base, outer margins scarcely narrowed to near apex where they are strongly convexly rounded to appressed apices.

from carrots. R. T. Cotton, collector (686-17 TYPE).

Agallia pulchra sp. nov. DeLong & Wolcott

Light yellow. Length 3-3.5 mm. Vertex cadmium yellow, longest near sides because of dark protruding eyes; a pair of transverse black dots on or near posterior margin making it appear angled; a pair of much larger black spots in front of eyes, a smaller median spot on anterior margin and usually another median one on front. Pronotum bright orange, fading to canary yellow on posterior margin, with black anterior margin, and median line extending between a pair of large black spots, often coalesced with margin broadened behind eyes. Scutellum yellow with black depression and a pair of black spots anteriorly. Elytra black, but with venation broadly outlined in greenish-yellow on clavus, lighter on corium, almost obliterating the black near the outer margin, and entirely so between distal portions of sections of the clavus.

Genitalia: *Female* last ventral segment longer than preceding, lateral angles produced, posterior margin concavely excavated with a narrow median incision at middle. *Male* valve short, almost concealed under last ventral segment, apex bluntly rounded. Plates rather broad at base, three times as long as last ventral segment, gradually narrowed to rather blunt tips.

from carrots (686-17); from sugar cane at Guánica (138-21); from *Inga laurina* at Lares (164-22 TYPE); from coffee at Lares (393-21), at Utuado (476-21), from mountains north of Yauco (305-21, 85-22).

Tettigonia occatoria Say

Van Z. (627) on coffee and *Inga laurina*.

Wetmore 16-66: eaten by Tody, *Todus mexicanus*.

Wolcott 21-20: on sugar cane at Morovis.

common on tender stems of coffee (47-21, 82-21 det. McAtce, as identified by Fowler in Biol. Cent. Amer., 266-21), at Adjuntas (487-21), in mountains north of Yauco (87-22); throughout the coffee growing region (289-21); on orange at Jajome Alto (22-21); on *Solanum torvum*, *Heckeria peltata*, *Phytolacca decandra* and coffee in mountains north of Yauco (234-22); on stems of fresa, *Rubus rosaeifolius*, at Adjuntas (47-23); nymphs on *Heckeria peltata* at Vega Alta (106-21).

Tettigonia sirena Stal

Smyth 19-145: on "sugar cane, citrus, coffee, sesame, garden plants.

Wolcott 21-20, fig. 6: on gramma grass, *Stenotaphrum secunda-*

tum, and Bougainvillea vine at Pt. Cangrejos; on sugar cane at many points.

Tower 22-24: unsuccessfully used in transmission of mosaic disease of sugar cane experiments.

on malojillo grass, *Panicum barbinode*, (439-16, 519-17), on weeds (430-17), on *Urena lobata* (150-17), on sesame (771-11), on carrots (574-17, 529-17), on *Agati grandiflora* (156-21); on grapefruit at Vega Baja (534-16); on ganduli, *Cajanus cajan*, at Comerío (760-13 det. Heidemann, 770-13); on coffee at Lares (290-21), at Ciales (224-22); on weeds at Bayamón (509-17); on sugar cane at Hormigueros (35-22), at Bayamón, Barceloneta, Córseca, Adjuntas and Guánica (GNW).

Kolla fasciata Walker

(as *K. fuscolineella* Fowler) Wolcott 21-22, fig. 7: on St. Augustine, Bermuda and carpet grass, on sugar cane and malojillo grass, commonest in the hills. Illustration of adult.

on carpet grass in coffee grove at Ciales (63-21): on sugar cane at Toa Alta (450-21), at Corozal (GNW—det. as *Tettigonia arcuifera* by Mr. Gibson), at Río Piedras and Coloso (GNW).

Kolla similis Walker

(as *Tettigonia*) Van Dine 11 31; Van Dine 12-22; Van Dine 13-257: on sugar cane.

Smyth 18-118; Smyth 19-145: on malojillo grass and young sugar cane.

Smyth 19-99; Tower 22-24; Wolcott 23-45: unsuccessfully used in mosaic disease of sugar cane transmission experiments.

Wolcott 21-22 to 28, fig. 8: the most extended account; life history and abundance as affected by size of cane, contour of field, and rainfall. Illustration of adult and nymph.

Chardón 23-64 to 67: abundance in fields of young cane where mosaic disease is spreading.

on sugar cane (218-13, 286-19), at Naguabo (35-10 det. Heidemann as *Tettigonia*), at Fortuna (54-10), at Hormigueros (36-22), at Toa Alta (453-21); on grass in coffee grove at Ciales (62-21); on weeds (429-17, 516-17), on corn (447-17); on carrots (530-17); on beans (202-16). Nymphs on sugar cane (164-19, 221-19), eggs in leaves of sugar cane (319-12, 287-19), parasitized by *Brachistella prima* Perkins, *Ufens niger* Ashmead and *Oligosita comosipennis* Girault (335-12 det. Girault).

Draeculacephala sagittifera Uhler—det. Metcalf

Wolcott 21-28, fig. 10: on sugar cane, not abundant.

on sugar cane at Hormigueros (33-22), at Guánica (139-21); nymphs and adults common on Bermuda grass (260-21), at Aguada (GNW).

- Xerophloea viridis** Fabricius—det. McAtee
common on carrots (528-17, 684-17); on grass at Aguadilla (232-22); at light at Yauco (304-21).
- Xestocephalus pulicarius** Van Duzee—det. Metcalf
on coffee (78-21), at Lares (392-21); at light at Pt. Cangrejos (GNW).
- Spangbergiella vulnerata** Uhler
Wolcott 21-29: from sugar cane and malojillo grass, rare, swept from weeds (432-17), at light (GNW).
- Scaphoideus fasciatus** Osborn—det. Ball
Wolcott 21-31: on sugar cane at Bayamón, at light at Pt. Cangrejos.
at light (329-21).
(See page 262.)
- Scaphoideus bimarginatus** sp. nov. DeLong
Resembling *auronitens* Provancher in general appearance, but with two parallel bands above, and one beneath the ocelli. Length 4 mm.
Vertex very bluntly angled, a little wider between the eyes than length at middle. Pronotum longer than vertex, twice wider than long. Elytra little longer than abdomen.
Color: Vertex dull golden yellow, a curved band just above ocelli and parallel to anterior margin, a second one just posterior to it and as far distant as the width of the first, the space between silvery white. Pronotum and scutellum golden yellow, mottled with brown. Elytra pale brownish, subhyaline, veins and a few small areas dull brown. Face with a heavy black band just below ocelli, a narrow pale band beneath it, the remainder of the face pale brown shading to yellow on clypeus with no indication of arcs. Beneath yellow, marked with brown.
Genitalia: *Female* last ventral segment about twice as long as preceding, lateral margins short, gradually produced to form a broad, short median tooth.
described from one female collected at light at Pt. Cangrejos, Feb. 27, 1920 (GNW).
- Platymetopius** sp.
on string beans (207-16).
- Deltocephalus flavicosta** Stal—det. DeLong
(as *D. contestus* Uhler MS) Gundlach.
(as *D. senilis* Uhler—det. Metcalf) Wolcott 21-29, fig. 11: on sugar cane and malojillo grass.
at light (569-17), on carrots (541-17, 538-17, 685-17); on sugar cane at Hormigueros (34-22).

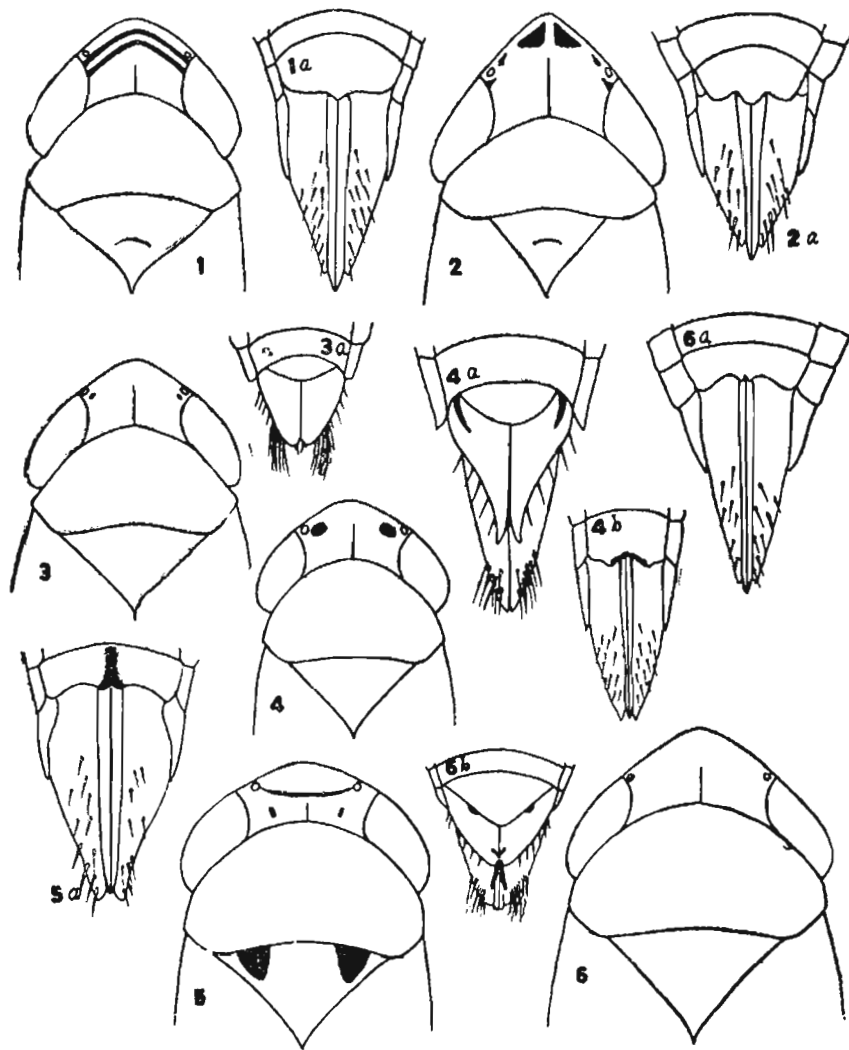


PLATE 1.—1. *Scaphoidcus bimarginatus*: 1 a, female genitalia. 2. *Deltocephalus trilobatus*: 2 a, female genitalia. 3. *Deltocephalus nigripennis*: 3 a, male genitalia. 4. *Cicadula maidis*: 4 a, male genitalia; 4 b, female genitalia. 5. *Chlorotettix nigromaculatus*: 5 a, female genitalia. 6. *Chlorotettix bidentatus*: 6 a, female genitalia; 6 b, male genitalia. (Original. Drawn by D. L. DeLong.)

Deltocephalus sonorus Ball—det. DeLong
on malojillo grass at Pt. Cangrejos (GNW).

Deltocephalus trilobatus sp. nov. DeLong

Resembling *D. micarius* Ball in form, size and coloration. Vertex more produced and genitalia distinct. Length 2.5 mm.

Vertex distinctly angled, a little longer on middle than between eyes. Pronotum shorter than vertex, twice wider than long. Elytra with clavus reticulate: central anteapical cell constricted and divided.

Color: Vertex dull yellow with a pair of orange triangular spots at apex and two small brownish spots just above either ocellus. Median impressed line brown. A darker longitudinal area extends back on either side, crossing pronotum and terminating on basal angles of scutellum. Two other longitudinal stripes on pronotum lateral of the central pair. Elytra dull yellow, veins more or less heavily infuscated. Face brownish with traces of pale areae. Beneath, yellow marked with brown.

Genitalia: *Female* last ventral segment about as long as preceding; side margins very short, lateral angles produced and rounded, between which, the posterior margin gradually slopes to a slight emargination on either side of a rounded, rather broad, but short median tooth which scarcely exceeds lateral angles in length. Underlying membranes conspicuous at either side.

described from a single female at light at Pt. Cangrejos, Dec. 16, 1919 (GNW).

Deltocephalus nigripennis sp. nov. DeLong

In general appearance somewhat resembling the *nigrifrons* group, but with coloration and genitalia distinct. Length 4 mm.

Vertex roundly produced, more than one-fourth wider between eyes than length at middle. Pronotum one-fourth longer than vertex and almost twice as wide as long. Elytra with central anteapical cell produced anteriorly and posteriorly beyond inner and outer anteapicals, and very much longer than outer cell.

Color: Vertex, pronotum and scutellum bright green tinged with yellow, a small black area on lateral margin on pronotum. Elytra, whitish, subhyaline, almost covered with black; a broad stripe along claval and commissural line to tip of clavus and a transverse band just before tip of clavus whitish, remainder black. Face black with only a few traces of pale areae. Venter black, lateral margin yellow.

Genitalia: *Male* valve two-thirds as long as preceding segment, rather broad, convexly rounded. Plates together at base one-fourth wider than long, gradually sloping to blunt, rather

broadly rounded apices. Tips with tufts of whitish pubescence.

described from one male swept from grass at Boquerón (98-Feb. 21, 1923 GNW).

Euscelis (Athysanus) striolus Fallen—det. DeLong
on malojillo grass at Pt. Cangrejos (GNW).

Athysanus exitiosus Uhler—det. Ball
Wolcott 21-30, fig. 12: on sugar cane at Patillas and Hatillo.
rare.

Acinopterus acuminatus Van Duzee—det. DeLong
swept from grass at Boquerón (99-23).

Thamnotettix colonus Uhler—det. Metcalf
Wolcott 21-30, fig. 13: on sugar cane and malojillo grass, but
commonest on carpet grass, *Axonopus compressus*, in the hills.
(as *Tettigonia similis* Walker—a misidentification) Johnston
15-23: killed by *Empusa muscae* (provisional determination).
on sugar cane (654-12), on grass (451-16), on tobacco
(1153-16).

Thamnotettix nigrifrons Forbes—det. GNW
on carrots (532-17).

Thamnotettix comatus Ball (?)—det. DeLong
Two large and four small black spots on vertex.
on carrots (532-17).

Chlorotettix viridius Van Duzee—det. DeLong
at light at Pt. Cangrejos (GNW).

Chlorotettix bidentatus sp. nov. DeLong
Resembling *minimus* Baker in size and form, but genitalia are
distinct. Length 3.5—4 mm.

Vertex bluntly angled, about one-fourth longer on middle
than next eyes and almost twice as wide between eyes as length
at middle. Pronotum not quite twice as long as vertex.

Color: Dull yellowish-green, unmarked.

Genitalia: *Female* last ventral segment about as long as
preceding, lateral angles produced and rounding, posterior
margin shallowly excavated to a short, broadly-rounded median
tooth, notched at apex. Whole tooth broadly embrowned.
Male valve roundly produced, bluntly angled, more than
twice as long as preceding segment and almost twice as broad
as long. Plates exceeding valve by one-third its length,
strongly convexly rounded to rather appressed blunt apices,
greatly exceeded by pygofers.

described from two females and one male, at light at Pt.
Cangrejos, Dec. 16, 1919, Feb. 8 and 26, 1920, and one female

on sugar cane at Guánica, Dec. 10, 1919 (GNW). TYPE specimen is a female.
 (as sp.) Wolcott 21-31, fig. 15: on sugar cane at many places, and at light at Pt. Cangrejos.
 on weeds (567-16), at Humacao (689-17); on sweet potato (201-17).

Chlorotettix sp. nov. (undescribed)

Wolcott 21-32, fig. 16: on sugar cane at Guánica and Patillas; at light at Pt. Cangrejos.

Chlorotettix nigromaculatus sp. nov. DeLong & Wolcott

One of the round-headed species, yellowish-green with brown markings. Length 4.5 mm.

Vertex well rounded in front, slightly longer on middle than next eyes and almost twice as wide between eyes as length at middle. Pronotum twice as long as vertex and almost twice as long. Elytra rather long, appearing wedge-shaped when folded.

Color: Vertex yellowish-green, ocelli large, reddish, a transverse brown band just above them not reaching eyes. A pair of large round black spots on rounded margin just below ocelli. Face yellowish with slight traces of ares. Pronotum yellowish, unmarked. Scutellum with a large subtriangular dark brown spot in each basal angle extending under the pronotum. Elytra whitish, hyaline, nervules milky white, two oblique brown stripes on inner clavus between veins and a broader one between claval vein and corium. Some of the cells of corium yellowish.

Genitalia: *Female* last ventral segment one-half longer than preceding, lateral angles produced, posterior margin shallowly concavely rounded and slightly notched at middle. A median brown stripe extends to base of segment.

described from a single female at light at Río Piedras (326-Oct. 10, 1922 GNW).

Jassus obligatus Uhler—det. McAtee

on leaves of *Picus laevigata* at Quebradillas (221-21).

Cicadula sexnotata Fallen

Wolcott 21-31: on sugar cane at Patillas and Garrochales.

Cicadula maidis sp. nov. DeLong & Wolcott

In coloration resembling a very pale *variata* Fallen, elytra long, resembling *Thamnotettix fitchii* Van Duzec, but with typical *Cicadula* venation. Length 3.5—4 mm.

Vertex roundly produced, thick, about one-third wider between eyes than length at middle; pronotum one-half longer than vertex, very strongly convexly rounded anteriorly; elytra long, greatly exceeding abdomen in both sexes.

Color: Straw yellow, vertex with a pair of large round

black spots, one just behind each ocellus; frequently a small spot at tip of vertex, median impressed line and four spots at base a darker yellow. Pronotum with an indication of longitudinal vittae. Basal angles of scutellum a darker yellow. Elytra yellowish, subhyaline, veins lighter.

Genitalia: *Female* last ventral segment longer than preceding, posterior margin slightly produced on either side of a broad, rather shallow, median V-shaped notch, which is slightly embrowned. *Male* valve as long as preceding segment, convexly rounded. Plates exceeding valve by more than twice its length, broad at base, concavely narrowed at half their length to form narrow, rather sharp-pointed apices. A brown mark near outer margin of either plate at base. Pygofers exceeding plates.

adults and nymphs abundant on corn (448-17 TYPE), at San Sebastián (102-21), (at Haina, Santo Domingo, August 1920, GNW); on sugar cane (645-12), on carrots (540-17). Corn the normal and common host.

***Eugnathodus bisinuatus* sp. nov.** DeLong

In coloration resembling *Balclutha osborni* Van Duzee, but with vertex as wide or wider than pronotum and with distinct genitalia. Length 3—3.5 mm.

Vertex broadly rounded, almost parallel margined, three and one-half times as wide between eyes as length at middle. Pronotum more than three times as long as vertex. Elytra long, greatly exceeding abdomen.

Color: Bright green without definite markings. Eyes dark; elytra greenish, subhyaline. Beneath yellow to bright green.

Genitalia: *Female* last ventral segment about as long as preceding, posterior margin bisinuate, forming three rather distinct lobes. A brown line indicates a more distinct trilobate condition, which is apparently covered posteriorly by a thin membranous portion. *Male* valve triangular, tip blunt or truncate. Plates exceeding valve by one and one-half times its length, short and broad, broadly rounded at apex. A rather long narrow process extends dorsally from the dorsal surface of each plate.

described from a large series of specimens from seed heads of malojillo grass, *Panicum barbinode*, at Río Piedras, March 2, 1923 (GNW).

(as *Balclutha* sp. (*Gnathodus*) in part, and also as No. 49, "not yet determined") Smyth 19-107, and 19-146: on sugar cane and malojillo grass seed-heads (the name given by Smyth for "malojillo", *Eriochloa subglabra*, is not a synonym of *Panicum barbinode*, but both grasses are called "malojillo" in Porto Rico, being similar in appearance and often growing together.)

(as *Balclutha osborni* Van Duzee) Wolcott 21-32: on sugar cane and malojillo grass.

on sweet potato (202-17), on carrots (448-17), on sedge, *Cyperus ferox* (222-13 det. as *Gnathodus* sp. by Mr. Gibson), on Bermuda grass (261-21), on sugar cane (298-19, 218-19, 546-16), on sugar cane or malojillo at Coloso, Vega Alta, Manatí and Bayaney (GNW).

Eugnathodus guajanae sp. nov. DeLong

Resembling *E. abdominalis* Van Duzee in form and coloration, but with distinct genitalia. Length 3.5—4 mm.

Vertex broadly rounded, almost parallel margined, about four times as wide between eyes as length at middle. Pronotum three and one-half times as long as vertex. Abdomen extending only slightly beyond apex of clavus.

Color: Yellow to pale brownish, often tinged with pink. In well marked specimens, the brownish or pink longitudinal vittae are distinct and cross vertex and pronotum. Elytra milky white, subhyaline, often tinged with pink. Beneath yellowish.

Genitalia: *Female* last ventral segment about twice as long as preceding, posterior margin rather deeply and narrowly notched at middle, forming two broadly-rounded lobes. *Male* valve triangular, apex blunt. Plates convexly rounded, apices narrowed, up-turned tips often visible from beneath. Pygoformers exceeding plates in length.

described from a series from arrows of sugar cane or "guajanas" at Río Piedras (377-22).
(as "Cane Seed-Head Leafhopper" (*Balclutha* sp.) in part) Smyth 19-107: "In December and January it occurred in the greatest abundance in the seed tassels of such cane plants as bore seed, and is believed to have been a principal cause of the low fertility of the seed. For this reason it may be a serious retarding factor in production of new cane varieties. The nymphs, which are dark in color with lighter dorsal stripe, could be shaken by thousands from a single cane seed tassel. They are heavily preyed upon by larvae of a Syrphid fly" (*Allograpta limbata* Fabr.).

on sugar cane at Aguadilla (31-22), at Vega Alta (Jan. 21, 1920 GNW) and from Vieques Island (Dec. 20, 1919 GNW).

(See page 268.)

Protalebra brasiliensis Baker—det. DeLong

(as *Erythronura comes* Say) Woleott 21-31, fig. 14: on sugar cane and *Wedelia trilobata*, notes on nymphs.

on carrots (533-17, 572-17, 683-17).

Alebra aureovittatus sp. nov. DeLong

Size and form of *curvilineata* with distinct coloration. Length 3 mm.

Vertex rather long and conical, very narrow between the

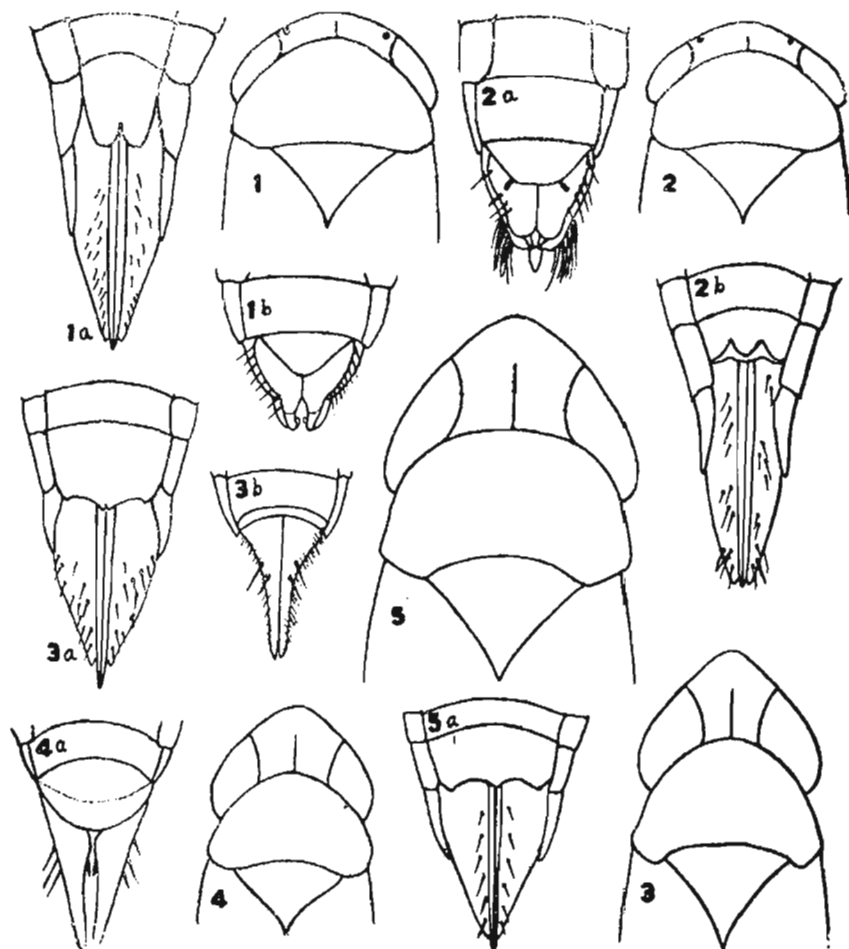


PLATE 2.—1, *Euganthodus guajanac*: 1 a, female genitalia; 1 b, male genitalia. 2, *Eugnathodus bisinatus*: 2 a, male genitalia; 2 b, female genitalia. 3, *Alebra aurcovittatus*: 3 a, female segment; 3 b, male genitalia. 4, *Empoasca sexmaculata*: 4 a, male genitalia. 5, *Empoasca brevidens*: 5 a, male genitalia. (Original. Drawn by D. L. DeLong.)

eyes, almost one-half longer on middle than width between the eyes. Pronotum wider than head, twice as wide as long, longer than vertex, posterior margin strongly concave, humeral angles prominent; scutellum proportionately large. Elytra much longer than abdomen.

Color: Vertex, pronotum and scutellum white, disc of pronotum bright yellow. Elytra white, a broad commissural line reaching to apex of clavus, outer claval vein and apex usually marked with yellow; a smoky spot on tip of clavus, one usually on costal area two-thirds the distance to apex and a round, dark brown spot on basal portion of central apical cell.

Genitalia: *Female* last ventral segment longer than preceding, lateral margins rounded to posterior margin, which is gradually produced to a central, angular, toothed portion. *Male* valve very short, longest at sides, concavely rounded. Plates rather narrow, extremely long, concavely rounded and produced about five times length of last ventral segment, set with numerous white hairs and each armed with two large black spines at about its middle.

described from a series of three females and four males, from underside of leaves of shoots of undetermined tree at Ciales (221-Aug. 22, 1922 GNW).

***Empoasca brevidens* sp. nov.** DeLong

Vertex roundingly, almost conically, produced, as long as width at middle, ocelli large and readily seen from above. Pronotum longer than vertex and more than twice as wide as long. Elytra rather long, greatly exceeding the abdomen. Veination of underwings rather unique: although there is only one closed cell, there is one open cell on the costal apical portion.

Color: Vertex, eyes, pronotum, scutellum and dorsum of body are shining black. Elytra smoky green at base, tips smoky, subhyaline. Face dull reddish above, yellow below. Ventral portion of thorax yellow, of abdomen shining black, last two segments milky white.

Genitalia: *Female* last ventral segment rather long, lateral angles prominent, posterior margin slightly excavated and produced at middle.

described from a single female from mountains north of Yauco on young coffee leaves (244-August 24, 1922 GNW). This species is quite distinct from other *Empoasca*, especially in wing veination and structure of the head.

***Empoasca mali* Le Baron** (redetermined as ***E. flavescens* Fabricius** by DeLong)

Barrett 04-448: "severest insect enemy of beans and cowpeas."
Jones 15-3: "acute injury to garden beans, the leaves being badly curled and distorted."

Cotton 18-276: on a "great variety of plants", "great damage to bean".

Wolcott 21-33: "on cane when beans are growing between the rows."

on beans (406-13, 445-16, 480-16, 636-17, 444-17), on tobacco (1154-16), on carrots (534-17), beets (407-19), on sweet potatoes (449-17), all stages abundant on *Agati grandiflora*, causing yellowing and shedding of leaves (154-21 confirmed DeLong).

Empoasca sexmaculata sp. nov. DeLong

Resembling *mali*, but with vertex more angulate and with brown spots on elytra. Length 2.3 mm.

Vertex bluntly, angularly produced, almost as long as width between eyes. Pronotum with prominent humeral angles. Elytra greatly exceeding abdomen. No cross vein in wing forming a short closed cell as in typical *Empoasca* species.

Color: Pale white to yellow, slightly tinted with green. A pale orange area close to base on costa, a large round spot on clavus just back of scutellum, a paler one just back of apex of clavus and a third one, pale, on inner margin of inner apical cell. brown. Face and beneath white, tinted with yellow.

Genitalia: *Female* last ventral segment rather long, roundly produced, posterior margin rather broadly embrowned. *Male* valve roundly produced, longer than last ventral segment. Plates rather narrow and greatly elongated, their inner margins turned in, to form tubular structures which are produced upwards.

described from a pair, on "emajagua", *Partium tiliaceum*, at Pt. Cangrejos, (Jan. 13, and May 29, 1920 GNW), causing yellowing of the leaves. Large and small nymphs present.

The male genitalia are very distinct from other *Empoasca*s.

FULGORIDAE¹

Bothriocera venosa Fowler---det. Muir

(as sp. on *Palicourea crocea*) Stevenson 18-218: host of *Isaria saussurii* Cooke.

(as sp.) Smyth 19-146: on *Citrus* spp., *Palicourea* spp., *Anona* spp., *Piper aduncum*, sugar cane rarely; also from Vieques Island.

Wolcott 21-19²: rare on cane, common on wild orange at Pt. Cangrejos.

(294-12, 618-16, 824-16), at light (149-17), on grapefruit (809-16, 33-20, 66-20); on *Banisteria laurifolia* at Martin Peña (843-14); on *Inga vera* at Añasco (341-13); on *Inga laurina* at Lares (147-22); common on coffee at Corozal, Ciales, Lares and Yanco (291-21); nymphs at Ciales, brown with

¹Mr. Muir is publishing descriptions of several new species of Fulgoridae from Porto Rico in the Proceedings of the Hawaiian Entomological Society for 1923 (1924).

warts on head and thorax and with long iridescent spicules at caudum, and also swept from grass in coffee grove (61-21); on coffee, *Heckeria peltata* and very common on unidentified plant, many killed by fungus, in mountains north of Yauco (84-22).

Oliarus cinereus Wolcott 21-18, fig. 4. TYPE from Porto Rico: adults, singly or in coitu, common on cane, especially at Manati and Sardinera.

(as sp.) Wetmore 16-66: eaten by Tody, *Todus mexicanus*.

(as sp.) Smyth 19-147: "Cotton-tail plant-hopper — quite common on young cane."

Tower 22-24: unsuccessfully used in transmission of mosaic disease of sugar cane experiments.

on tomato (1152-16), on carrots (536-17), on beans (205-16), on corn (517-17), on eggplant (RTC); on sugar cane (132-11, 143-11, 661-12), at Toa Baja (445-21, 256-22), at Guánica (40-22); constituting 5% of food of lizzard, *Anolis pulchellus* (GNW).

Tangia angustata Uhler—det. McAtee

on *Inga vera* (83-21); on coffee at Cayey (409-21); on pokeweed, *Phytolacca decandra*, and on *Heckeria peltata* in mountains north of Yauco (313-21); the green nymphs, with brush of widely-diverging, transparent-iridescent spicules at caudum, reared to adult on coffee (93-21), on *Erythrina glauca* (39-21) by Mr. Seín; on wild orange at Jajome Alto (23-21).

Tangia sp. (smaller)

on grapefruit at Vega Baja (531-16); on sea-grape, *Coccoloba uvifera* at Loíza (126-22).

Thionia sp.—det. Muir

nymphs abundant, and a few adults, on sea-grape, *Coccoloba uvifera*, at Loíza (122-22), at Mameyes (340-22).

Acanalonia sp. nov.—det. Muir, "near *depressa* Melichar"

on shrub in woods at Schoruco, Laguna de San José (234-23).

Ormenis infuscata Stal—det. Heidemann

all stages on sugar cane, under and on aguacate, *Persea gratissima* (674-12); adults on grapefruit at Vega Baja (518-16), at Vega Alta (157-15); on coffee at Lares (150-20).

Ormenis marginata Brunnich—det. Heidemann

(128-12), on sea-grape, *Coccoloba uvifera* (133-15); on *Lantana camara* at Carolina (51-15); on coffee at Utuado (148-20), at Corozal (295-21); on weeds at Vega Alta (127-17); on ornamental vine at Santa Isabel (183-12, 71-13).

Ormenis pygmaea Fabricius—det. Heidemann

Van Z. (606) on coffee.

(127-12), on *Jasminium pubescens* (268-16), on *Cordia cor-*

Saccharosydne saccharivora Westwood

(as *Delphac*) Van Dine 12-20 to 22: on sugar cane, early references, collections in Porto Rico, life history and parasites.

(as *Delphac*) Van Dine 13-255; Van Dine 13-32; Van Z. (309) on sugar cane.

(as *Stenoecranus*) Smyth 19-147: on sugar cane.

(as *Delphac*) Jones 14-463: eggs parasitized by a Mymarid, identified as *Auagris ornata* Ashmead by Mr. Girault.

(as *Stenoecranus*) Pierce, W. Dwight, in Proc. Ent. Soc. Washington, Vol. 16, No. 3, Sept. 1914, p. 125: host of a new genus and a new species of Strepsiptera, *Stenoecranophila quadratus*.

(as *Delphac*) Wolcott 21-14, fig. 2: life history and abundance. Illustration of adult and nymph.

(as *Stenoecranus (Delphac)*) Tower 22-24: unsuccessfully used in mosaic disease of sugar cane transmission experiments.

on sugar cane (123-11, 141-11, 974-13, 165-19, 242-19, 157-21), at Luquillo (196-13), at Arceibo (186-11), at San Sebastián (21-22), at Guánica (238-11), throughout the Island but rare on south side.

Neomalaxa flava Muir—det. Muir

on cohite grass, *Commelina elegans*, at Ciales (278-21), at Lares and generally in the mountains. The nymphs produce five long filaments from the caudum, besides many smaller ones, and fine threads from the thorax.

Nilaparvata wolcottii Muir MS. TYPE from Porto Rico.

on malojillo grass at Pt. Cangrejos (GNW).

Sogota cubanus Crawford—det. Muir

(as *Megamelis flavolineatus* Muir) Wolcott 21-18, fig. 3: on sugar cane, both nymphs and adults.

(as *Perkinsiella* sp. "White-lined plant-hopper") Smyth 19-148: on sugar cane, rice and grasses.

on rice (41-20), on carrots (573-17, 535-17); on sugar cane at Toa Baja (286-21, 446-21).

Sogota approximata Crawford—det. Muir

on malojillo grass at Pt. Cangrejos (GNW); on grasses in cane fields at Toa Baja (447-21).

Peregrinus maidis Ashmead—det. Heidemann

Jones 15-2: on corn. Cotton 18-291: life history and control.

all stages on corn (532-12, 278-16, 446-17, 42-20), a common and rather serious pest: a single adult from leaf of sugar cane at Santa Isabel (72-13).

Delphacodes havanensis Crawford—det. Muir

on malojillo grass at Pt. Cangrejos (GNW).

- Delphacodes humilis** Van Duzee—det. Muir
on malojillo grass at Pt. Cangrejos (GNW); on guinea grass, *Paspalum hemisphaericum*, (107-12, 444-12 det. as "near *humilis*" by Mr. Heidemann).
- Delphacodes propinqua** Fieber—det. Muir
on malojillo grass at Pt. Cangrejos (GNW).
- Delphacodes teapae** Fowler—det. Muir
(as *Liburnia*) Wolcott 21-18: at light, on sugar cane, on malojillo and carpet grasses.
on carrots (542-17, 576-17); on carpet grass, *Axonopus compressus*, in coffee grove at Ciales (66-21); on malojillo grass at Mayagüez (38-23).
- Ladella pallida** Walker, TYPE from Porto Rico.
on malojillo grass at Río Piedras (March 31, 1920 GNW—det. Dr. H. L. Dozier).

PSYLLIDÆ.

- Psylla minuticon**a Crawford—det. McAtee
common on *Inga vera* at Lares (163-22) and throughout the coffee districts.
- Euphalerus nidifex** Schwarz—det. McAtee
adults on watershoots of *Ichthyomethia (Piscidia) piscipula* at Yauco (324-23); whitish nymphal skins common on host at Boquerón and Pt. Cangrejos (GNW).
- Heteropsylla mimosae** Crawford—det. McAtee
very abundant on *Acacia farnesiana* at Guánica and Guayanilla (GNW), at Guánica (103-13).
(undetermined Psyllids on *Pithecolobium saman* (431-16)).

ALEYRODIDÆ.

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- Aleurothrixus floccosus** Maskell
(material in U. S. Bureau of Entomology collection.)
- Aleurothrixus howardi** Quaintance
(as *Aleyrodes*) Tower 11-11: on guava and orange, life history and control.