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The Genus *Chlorotettix* (Homoptera-Cicadellidae) in Mexico

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Several species of *Chlorotettix* have been described from Mexican and Central American material, but no attempt has previously been made to bring together the species occurring in that country and to examine the type material, dissect the genital structures and establish the morphological characters for these and other tropical species, thereby determining the authenticity and synonymy of the group of species previously described. In view of the fact that most species have variable or no definite color markings and resemble each other very closely superficially, and that certain species may vary greatly in the intensity of color markings, it is logical that synonymy would occur easily unless the genital structures were used in formulating these descriptions. Furthermore, certain of the types have not been available for efficient study or dissection and this has further confused the problem of the species of this genus. In addition to the subtropical and exotic types in the author's collection, the type material in the collections of Professor Herbert Osborn, the National Museum, the California Academy of Science and the Carnegie Museum have been of particular value in this study.

Ten species previously described—*scutellatus*, *minimus*, *curvidens*, *vividus*, *tethys*, *emarginatus*, *lobatus*, *necopinus*, *nudatus* and *vittatus* are treated in the following pages. Seventeen species are described as new which occur in Mexico, Central America or Brazil. Twelve species which occur either in the southwestern United States along the Mexican border, in the southeastern Gulf States and Texas or in Central or South America but which have not yet been found in Mexico have also been included in this discussion. They are *orbonatus*, *vividus*, *lucidus*, *nigromaculatus*, *aberrans*, *bakeri*, *breviceps*, *delicatus*, *luteolus*, *truncatus*, *floridanus* and *aurum*.

The synonymy which has been established in the present paper shows *pallidus* Brown = *scutellatus* Osborn; *lineatus* Osborn = *minimus* Baker; *serratus* DeLong = *curvidens* Osborn; *dilutus* Osborn = *bidentatus* De Long = *tethys* V.D.

With few exceptions the known Mexican species of *Chlorotettix* are tropical in distribution and occur at fairly low altitudes. The four species—*vittatus* Osborn, *viridius* V.D., *nudatus* Ball and *minimus* Baker have been taken only at altitudes of a few hundred feet. Several others have a greater range in altitude as tropical forms. *C. tethys* V.D., *emarginatus* Baker and *bipartitus* DeLong have been collected near sea level at El Mante, Tamps., other low altitude localities and up to some 2500 feet at Igula, Gro. Three species, *necopinus* V.D., *curvidens* Osborn, and *scutellatus* Osborn, are undoubtedly tropical but vary in elevation from near sea level to some 3000 to 3500 feet. A species described at this time, *nigrolabes*, has been found as low as 300 feet elevation in Guerrero and as high as 5000 feet at Lake Chapala and Guadalajara in Jalisco. Three species particularly, *lobatus* Osborn, *striatus* DeLong, and *redimiculus* DeLong seem to be at the upper limit of the tropical range occurring only at elevations of 3000 to 3500 feet. Further collecting may show these to have a much wider range in altitude. Another group of species represented by *venosus* DeLong, *brunneus* DeLong, *subfuscus* DeLong and *obscurus* DeLong are apparently neotropical forms and occur entirely in that zone at elevations of from 4000 to 5000 feet. These occur in the pine association and some of them have been collected only from pine. Few species seem to occur at or be limited to high altitudes. *C. inscriptus* DeLong has been taken at an elevation of 7500 feet at Mexico City but also as low as 3500 feet at Orizaba. The only species which seems to be limited to an alpine habitat is *C. pinus* DeLong occurring on pines at 10,000 feet.

KEY TO SPECIES OR GROUPS OF SPECIES OF CHLOROTETTIX*

1. Color some shade of green, yellow or white without distinct dark color markings. 2
- 1'. Dark brown or smoky, or pale with distinct dark color markings. 5
2. Smaller in size, not exceeding 5.5 mm. in length. 3
- 2'. Larger, 6 mm. or more in length. 4
3. Vertex distinctly angled and produced. *viridius*, *lucidus*
- 3'. Vertex bluntly or broadly rounded, not angled. *tethys*,
minimus, *beeryi*, *variabilis* (in part), *truncatus*, *delicatus*, *aberrans*, *orbonatus*, *bakeri*, *undatus*.
4. Vertex broadly rounded, scarcely produced at middle. *viridius*, *spinosus*, *breviceps*.
- 4'. Vertex produced, blunt, rounded at apex or bluntly angled.
nudatus, *bipartitus*, *emarginatus*, *floridanus*, *aureum*.
5. Dark brownish green, smoky or brown. 6
- 5'. Usually paler with distinct dark markings. 11
6. Brownish green without distinct markings. 7
- 6'. Brownish green or brown with transverse markings on vertex. 9
7. Two proximal dark spots on anterior margin of pronotum. *venosus*.
- 7'. Without a pair of dark spots on anterior margin of pronotum. 8
8. Small in size female 6 mm. in length. *obscurus*
- 8'. Larger in size female 8 mm. in length. *subfuscus*
9. With a faint transverse line between ocelli and a dark brown spot on either side at base. . *pinus*

* The key is based upon the more common or conspicuous color markings. A detailed key based upon the genital characters seems unnecessary since the illustrations of these characters are included.

- 9'. A dark transverse line just above vertex margin between ocelli..... 10
 10. Vertex angled, transverse line pale..... *brunneus*
 10'. Vertex broadly rounded, transverse line broad and black..... *bicoloratus*
 11. A dark brown stripe along commissure of elytra..... *variabilis* (in part)
 11'. Without dark coloration along commissure of elytra..... 12
 12. Vertex with a distinct, but often narrow transverse brown band between eyes..... 16
 12'. Vertex without distinct transverse markings between the eyes..... 13
 13. White or yellow with distinct oblique lines on elytra..... 14
 13'. Yellowish or green without oblique lines..... 15
 14. White—scutellum with dark brown spots in basal angles..... *vittatus*
 14'. Yellow—basal angles of scutellum not dark..... *luteolus*
 15. Vertex with two round black dots at base..... *nigrolabes*
 15'. Without black spots on base of vertex, basal angles of scutellum with dark spots..... *striatus, curvidens*
 16. Size not exceeding 7 mm. in length..... 17
 16'. Size 7.5 to 8 mm. in length..... 20
 17. Not exceeding 5.5 mm. in length..... 18
 17'. From 6 to 7 mm. in length..... 19
 18. A pair of large, round, black spots on rounded margin just below ocelli..... *nigromaculatus*
 18'. Without black spots on margin of vertex..... *recurvatus*
 19. Basal angles of scutellum dark brown to black without definite markings on pronotum..... *scutellatus*
 19'. Basal angles not dark brown, a transverse row of brown spots across middle of pronotum..... *inscriptus*
 20. Transverse band between eyes narrow, basal angles of scutellum with dark spots..... *lobatus latocinctus*
 20'. Transverse band between eyes broad, basal angles of scutellum without dark spots..... *necopinus redimiculus*

CHLOROTETTIX NECOPINUS V.D.

Chlorotettix necopinus V.D. Can. Ent. 25: 282, 1893.

A large species with a broad black band between the eyes. Length 7.5–8 mm.

Vertex broad, blunt, scarcely angled, a little longer at middle than next the eyes, more than twice as wide between eyes at base as median length.

Color pale, marked with brown and black. Vertex dull yellow with a broad transverse black band between the anterior portion of the eyes. Pronotum dull brown with an irregular row of darker spots almost parallel to and not far posterior to anterior margin. Scutellum pale with a triangular dark spot in each basal angle and a median dark stripe in center. Elytra brownish veins paler. Face pale brown with short dark arcs on each side of middle.

Genitalia: Female last ventral segment with lateral angles strongly produced and rounded. Posterior margin broadly deeply excavated more than halfway to the base. The sides of the V-shaped excavation concavely rounded with a short produced tooth at apex. Male plates, short, broad, convexly rounded and constricted before apex to form a thick finger-like tip. Style broad at base, rather short, apical third rapidly tapered to a pointed apex. Aedeagus gradually widened from connective to truncate apex. In lateral view it appears narrowed to apex, the ventral portion is

convexly rounded. At the apex a long blade-like structure extends dorsally and a very short blade extends ventrally.

Specimens are at hand from Valles, S. L. P., elevation 312 ft. December 1, 1938 and September 24, 1941; Santa Engracia, Mex., elevation 1050, November 11, 1938; Tamazunchale, S. L. P., elevation 687 ft., November 15, 1938 and September 25, 1941 and Fortin, Ver., elevation 3281 ft., October 9, 1941, all collected by J. S. Caldwell, E. E. Good, C. C. Plummer, and the author.

Chlorotettix inscriptus n. sp.

Resembling *necopinus* superficially but with a more angled vertex and a more narrowed dark band between the eyes. Length 6.5–7 mm.

Vertex produced and bluntly angled, about one-third longer at middle than length next the eyes, more than twice as wide between eyes at base as median length.

Color pale brown with dark brown markings. Vertex with a narrow black band extending between anterior margins of the eyes, which is bent forward at the middle. Pronotum mottled with darker brown. Scutellum with a short transverse line at middle and two round dots just anterior to it. Elytra brownish subhyaline with paler veins. Face with conspicuous dark arcs either side of middle.

Genitalia: Female last ventral segment with lateral angles produced and rounded to concavely excavated posterior margin. The central fourth of margin is slightly produced and feebly notched. About two-thirds of the margin is embrowned. Male plates long, apices broad and rounded. Style tapered from a broad base to a bluntly pointed apex. It is slightly abruptly narrowed at about four-fifths its length on the outer margin. Aedeagus curved with the basal and apical portions extending dorsally. The apical portion is notched forming a pair of short terminal spines and just below these is a pair of short lateral processes. The pygofer is convexly rounded to ventral margin and bears a short spine on apex of ventral margin and a pair of spines at about middle of apical portion.

Holotype male, allotype female and paratype female collected at Mexico City, D.F., elevation 7500 ft., September 1 to 5, 1939, by C. C. Plummer and the author. Female paratype collected at Zimapan, Hidalgo, elevation 6000 ft., September 26, 1941, by Good and DeLong. Male paratypes from Orizaba, elevation 3500 ft. Ver., October 17, 1941, by Plummer, Good, Caldwell and DeLong. Paratype male collected at Jacala, Hidalgo, September 26, 1941, by Caldwell, Good and the author.

Chlorotettix redimiculus n. sp.

Resembling *necopinus* in form and coloration but with a blunter head and distinct genitalia. Length 8 mm.

Vertex bluntly angled, almost rounded, slightly longer at middle than

next the eyes and two and one-half times as wide between eyes at base as median length.

Color: Dull yellow with black and brown markings. The extent and intensity of the markings are variable. Vertex with a broad black transverse band between the anterior portion of the eyes. The entire basal two-thirds of the vertex is often black. Pronotum with anterior marginal third pale, the posterior portion black. Scutellum pale to dark brown. Elytra brown to black, veins pale. Face pale brown with traces of dark arcs on each side.

Genitalia: Female last ventral segment with strongly produced lateral angles which are rounded at apex. Posterior margin forming a broad, deep, U-shaped notch which extends halfway to the base of the segment and bears a conspicuous short tooth at its apex. Male plates concavely narrowed on apical half to form blunt pointed apices which curve to inner margin. Style long, broad at base tapered to a blunt pointed apex. Aedeagus broad and thick directed caudally notched at middle of apex forming a rather broad lobe on either side. Pygofer with a long rather narrow spine extending from the dorsal apical portion to ventral apical margin where it is sharp pointed.

Holotype male, allotype female and male and female paratypes collected at Orizaba, Ver., elevation 3500 feet, October 8, 1941. Male and female paratypes from Cordoba, Ver., elevation 3000 feet, October 8, 1941; Fortin, Ver., October 9, 1941, all collected by J. S. Caldwell, C. C. Plummer, E. E. Good and the author.

Superficially this species can scarcely be distinguished from *necopinus* and if it were not for the distinct male genital structures it might be considered as a color variation of *necopinus*.

***Chlorotettix latocinctus* n. sp.**

Resembling *necopinus* in general appearance but with distinct coloration and genitalia. Length 7.5 mm.

Vertex broadly rounded, scarcely produced, a little longer at middle than next the eyes, almost three times as wide between eyes at base as median length.

Color yellow to pale brown. A pale brown band on vertex margin and a darker transverse band just above margin between ocelli. Anterior portion of pronotum yellow with brownish spots. Posterior portion dark brown. Scutellum yellow with a central dark brown stripe and basal angles with dark brown spots. Elytra smoky, veins pale, brown margined. Face with dark arcs either side of median pale area.

Genitalia: Female last ventral segment strongly produced and rounded on anterior margin to a central notch at apex which is short and narrow. Male plates narrowed at about half their length on outer margin, apices

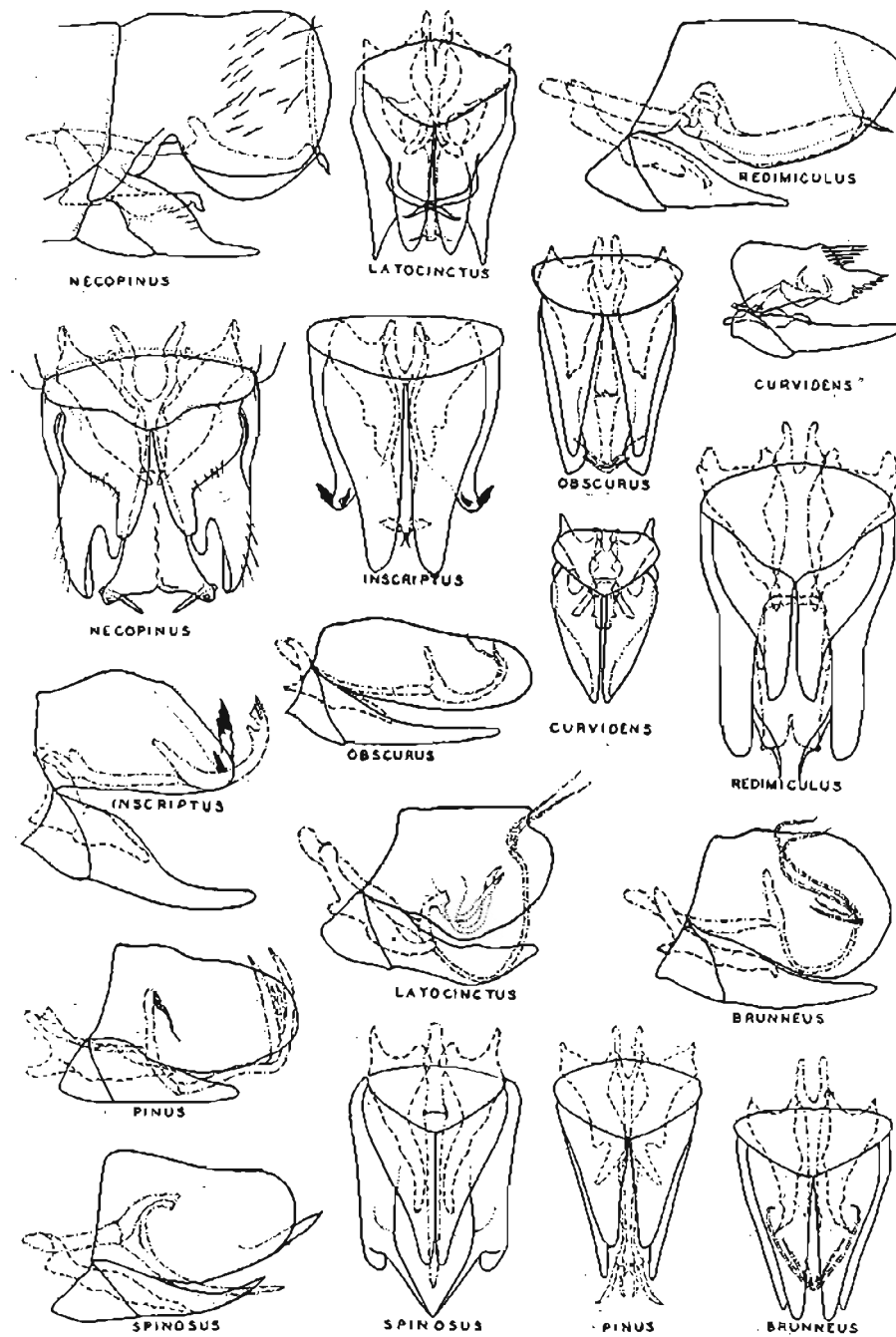


PLATE 1.—Lateral and ventral views of male genital structures in normal position, of species as labeled.

bluntly angled. Style broad at base, rapidly narrowed and produced as a narrow outwardly curved apex which is blunt at the tip. Aedeagus long and slender. The basal portion extends dorsally. The apical third is bifid forming two long slender apical processes which extend dorsally and caudally. A conspicuous pygofer spine arises at about middle of pygofer curves ventrally then inwardly crossing the median line.

Holotype male, allotype female and male and female paratypes collected at Vicosa, Brazil, in November 1929, by Edson Hambleton.

***Chlorotettix bicoloratus* n. sp.**

Resembling *latocinctus* in form and general appearance but with distinct color markings and genitalia. Length 8 mm.

Vertex broadly rounded, scarcely produced; length at middle equalling length next the eyes. More than three times as wide between the eyes at base as median length.

Color: Vertex black with a pale transverse band on base, broken at middle and not quite reaching to the eyes. Ocelli pale. Pronotum with anterior one-third pale with black spots on the middle third. Posterior two-thirds black. Scutellum with anterior half black and posterior half white, with four white spots about equally spaced along anterior margin. Elytra dark, smoky, veins paler. Face black with short pale arcs either side of middle. Ventral abdomen orange yellow, last ventral segment and pygofer black.

Genitalia: Female last ventral segment with produced rounded lateral angles. Posterior margin broadly excavated about half way to the base. The apex of the notch with two small black approximate teeth.

Holotype female collected at Vicosa, Brazil, November 1929, by Edson Hambleton.

***Chlorotettix obscurus* n. sp.**

Resembling *tergalus* in general form and color but smaller and with distinct genitalia. Length 5.5-6 mm.

Vertex broad, bluntly angled and produced about two-thirds its length before the anterior margins of the eyes. About one-third longer at middle than next the eyes and more than twice as wide between eyes at base as median length.

Color brown tinged with green, the vertex paler than pronotum and scutellum. Face greenish with darker arcs either side of a median longitudinal band.

Genitalia: Female last ventral segment with lateral angles broadly rounded to posterior margin forming a broadly rounded lobe either side of a median V-shaped notch reaching about half way to base of segment. The

apex of notch is narrow and brown margined. Male plates long, tapered to blunt apices. Style broad, rather short, apical half narrowed to a blunt apex with a pointed tooth on outer apical margin. Aedeagus rather short, broadly U-shaped with the basal portion curved dorsally and the apical portion curved dorsally and forming four conspicuous apical processes. The outer pair are longer than the inner pair and all extend dorsally.

Holotype male, allotype female and male and female paratypes collected at Carapan, Michoacan, elevation 5000 ft., October 2, 1941, by E. E. Good, J. S. Caldwell, C. C. Plummer and the author.

***Chlorotettix pinus* n. sp.**

Resembling *tergatus* in form and coloration but much smaller in size and with distinct genitalia. Length 6.5 mm.

Vertex broadly rounded, length at middle not exceeding length next the eyes, appearing parallel margined.

Color pale brownish with dark brown markings. Vertex with a pale line between the ocelli and a dark brown spot on either side at base. Pronotum with dark brown mottled spots on the anterior half and posterior half dark brown. Scutellum pale with basal angles dark brown and a pair of small round brown spots at middle. Elytra brownish subhyaline the veins inconspicuous. Face with a row of dark brown arcs either side of a broad middle pale area.

Genitalia: Female last ventral segment with lateral angles broadly rounded to posterior margin forming a rounded lobe either side of a rather broad V-shaped median notch which extends to base of segment and is embrowned at apex. Male plates long, triangular, apices blunt, rounded. Style rather broad, deeply notched on outer margin at two-thirds its length so as to form an outwardly curved fingerlike apex curving from the inner margin. Aedeagus long and rather slender curving dorsally to form a long erect process at base and curving dorsally at apex and forming four terminal processes. The outer pair are longer, heavier and divergent; the inner pair are shorter, more slender and convergent.

Holotype male, allotype female and male and female paratypes collected at an elevation of 10,000 feet from pine 43 kilometer south of Mexico City, September 5, 1939, by C. C. Plummer and the author. Male and female paratypes were collected from pine near the same locality at LaGuardia, Mor., October 26, 1941, by E. E. Good and the author. Types in author's collection.

***Chlorotettix subfuscus* n. sp.**

Resembling *tergatus* in general appearance and coloration but with distinct genitalia. Length female 8 mm.

Vertex produced and bluntly angled, one-third longer at the middle than

length next eyes, more than twice as wide between eyes at base as median length.

Color brown tinged with green, veins pale.

Genitalia: Female last ventral segment long. Posterior margin broadly rounded either side of a broad, shallow median V-shaped notch about half the width of the segment and extending only a small portion of the distance to base.

Holotype female and female paratype collected at Carapan, Mich, Mexico, elevation 5000 ft., October 2, 1941, by Plummer, Caldwell, Good and DeLong.

***Chlorotettix venosus* n. sp.**

In general appearance resembling *nudatus* but with distinct markings and genitalia. Length 7.5-8 mm.

Vertex produced, broad and bluntly angled, only slightly longer at middle than next the eyes and almost three times as wide between eyes at base as median length.

Color pale brown with darker markings. Vertex with pale ocelli. A pale waved line just beneath ocelli and a brown waved line passing through ocelli just above the pale line. Pronotum with irregular brown mottling. Basal angles of scutellum with dark brown spots. Veins of elytra pale margined with brown. Face pale with darker arc on either side of a central longitudinal band. Three small black dots arranged in a triangle just beneath apex of vertex. A heavy black quadrate spot just back of eye on lateral margin of pronotum.

Genitalia: Female last ventral segment with produced rounded lateral angles between which the posterior margin is broadly deeply notched, about two-thirds the distance to the base. A black spot on each side of the V-shaped notch at base. Male plates long, tapered to a blunt, rounded apex. Style with central portion narrowed. Outer margin conspicuously notched near apex, inner margin strongly curved, forming a blunt pointed apex which is bent outwardly. Aedeagus rather long and slender. The basal portion is long and erect. The apex is composed of four long slender processes. The two outer processes are longer than the inner pair and all extend dorsally.

Holotype male, allotype female and male and female paratypes collected at Tuxpan, Michoacan, Mexico, elevation 4002 ft., October 5, 1941. Paratype male collected at Zamora Michoacan, elevation 5140, October 2, 1941, by C. C. Plummer, E. E. Good, J. S. Caldwell and the author.

***Chlorotettix brunneus* n. sp.**

Resembling *venosus* in general form and appearance but with more produced head and distinct genitalia. Length 7 mm.

Vertex produced and bluntly angled, about twice as long at middle as length next eyes. More than twice as wide between eyes at base as median length.

Color pale brown. A darker line just above vertex margin between ocelli. Pronotum brown, somewhat mottled. Scutellum with basal angles dark brown. Elytra brownish subhyaline, veins pale margined with brown.

Genitalia: Female last ventral segment with lateral angles produced and rounded forming a broad lobe either side of a broad deep excavation on the posterior margin at the bottom of which is an almost truncate, brown margined, median third which is slightly notched at middle. Male plates rather long, tapered to blunt rounded apices. Plate broad at base tapered to a narrow apex which appears almost truncate but slopes to a sharp point on the outer margin. Aedeagus narrow forming a V-shaped loop. The base is thickened and is erect. The apex is composed of four narrow terminal processes. Two are rather short and the other two are three times as long. All four are directed dorsally and anteriorly.

Holotype male, allotype female and male paratypes collected at Chilpancingo Guerrero, Mexico, elevation 4488 feet, October 25, 1941, by E. E. Good and the author.

CHLOROTETTIX VIRIDIUS V.D.

Chlorotettix viridius V.D. Psyche 6: 309, 1892.

A small species with broadly rounded head, apple green in color and with distinct genitalia. Length 6–6.5 mm.

Vertex broadly rounded, scarcely longer at middle than next the eyes and more than two and one-half times as wide between eyes at base as median length.

Color bright apple green, eyes usually dark.

Genitalia: Female last ventral segment with lateral angles produced and angled. The posterior margin forming a broad V-shaped notch with a prominent rounded tooth at about the middle on either side. Male plates short and broad, convexly rounded to form bluntly pointed apices. Style broad at base, constricted between base and a slightly widened, truncate apex. Aedeagus in lateral view curved upwardly at apex and appearing excavated at middle. The tip is narrow and bifid forming a pair of short, pointed teeth.

Specimens are at hand from Laredo, Nuevo Leon, elevation 600 ft., December 6, 1938 (Caldwell), and Loma Bonita, Oaxaca, June 8, 1937 (M.F. 6070A), collected by Dampf. It is undoubtedly more widely distributed than these records indicate.

Chlorotettix spinosus n. sp.

Resembling *viridius* in form but smaller with rounded head and distinct genitalia. Length male 6 mm.

Vertex broadly rounded scarcely produced, length at eyes almost as great as length at middle, more than twice as wide between eyes at base as median length.

Color yellowish tinged with green.

Genitalia: Male plates elongate, triangular, with narrow, pointed apices. Style long, broad at base, narrowed at one-third its length and tapered to blunt pointed apices. Aedeagus thickened at base with a conspicuous dorsally curved portion. It tapers from the base to a slender pointed apex which extends caudally. The pygofer bears a long heavy spine on the ventral margin near the apex which extends dorsally and caudally.

Holotype male and paratype male collected at Buena Vista, Guerrero, Mexico, elevation 3400 ft., October 23, 1943, from meadow grasses by E. E. Good and the author.

CHLOROTETTIX ABERRANS Osb.

Chlorotettix aberrans Osb. Anns. Carn. Mus. 15: 72, 1923.

A small blunt headed yellowish species. Length 5.5 mm.

Vertex blunt but somewhat produced at middle, one-fourth longer at middle than length next eyes.

Color: Yellowish without definite markings.

Genitalia: Male plates medium in length, convexly rounded to broad, blunt, rounded apices. Style long, broad at base, gradually tapered to bluntly pointed apices. Aedeagus short, thick. In lateral view appearing rounded ventrally and bearing a long, curved, tapering process extending from the anterior ventral portion and directed caudo-ventrally. A long curved pygofer spine arises on the caudo ventral margin each side and curves anteriorly then dorsally and the sharp pointed apex extends caudally.

This small species was described from a holotype male from Januaria, Brazil. The type has been used to prepare the illustrations. No Mexican records are available at this time.

CHLOROTETTIX DELICATUS Osb.

Chlorotettix delicatus Osb. Anns. Carn. Mus. 15: 73, 1923.

A produced but blunt head species. Length 4.5-5 mm.

Vertex produced, blunt at apex but only slightly longer at middle than at eyes due to the strong curvature of the basal portion next the pronotum. Vertex produced about one-half its length before the anterior margin of the eyes.

Color yellowish with green tinge, without definite markings.

Genitalia: Male plates long, broad at base, apices broad and rounded. Style tapered from base to near apex where it is broadened and almost truncate. The outer apical margin is rounded and the inner margin bears a sharp-pointed tooth. Aedeagus bearing a dorsal process not far from

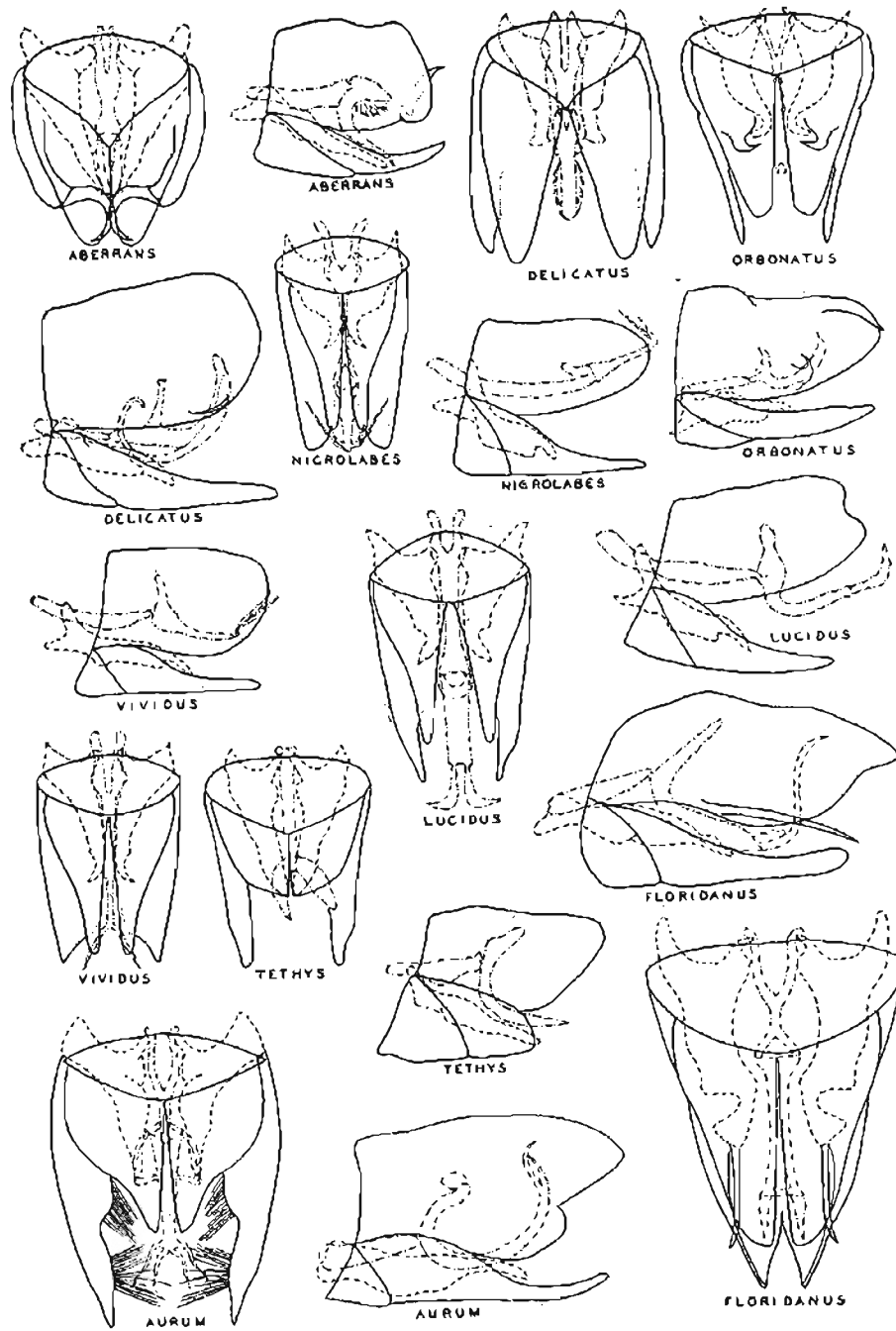


PLATE 2.—Lateral and ventral views of male genital structures in normal position, of species as labeled.

base which is long and straight. The apical third is curved dorsally and bears a slender process either side which extends cephalad. A portion of the body of the aedeagus curves ventrally beneath the straight portion bearing the dorsal process.

The type series contained specimens from Brazil and Bolivia. It has not been found in Mexico to date.

CHLOROTETTIX TRUNCATUS Osb.

Chlorotettix truncatus Osb. Anns. Carn. Mus. 15: 75, 1923.

A small pale blunt headed species. Length 4.7 mm.

Vertex bluntly angled, one-fourth longer on middle than length next the eyes.

Color pale yellow, elytra appearing whitish.

Genitalia: Female last ventral segment with posterior margin appearing truncate.

The female holotype was described from Bolivia and apparently is a distinct species. The male allotype as designated is the male of *minimus* Baker and no male has been found which is thought to belong with the female as here described. No records are at hand for Mexico.

Chlorotettix orbonatus (Ball)

Thamnotettix orbonatus Ball, Can. Ent. 35: 229, 1903.

Chlorotettix productus S. & DeL. Anns. Ent. Soc. Am. 12: 236, 1919.

A small wedgeshaped species with a rounded vertex and distinct genitalia. Length 5 mm.

Vertex roundedly produced, appearing almost parallel margined, slightly longer on middle than next the eyes, about twice as wide as long.

Color: Dull yellowish green without definite markings.

Genitalia: Female last ventral segment with lateral angles rounded to posterior margin which is concavely sinuate either side of a slightly produced median third which is slightly notched at middle. Male plates elongate, triangular, concavely rounded on outer margins, apices blunt. Style narrow, strongly excavated on outer margin just before apex forming a short thick finger-like tip. Aedeagus short, narrow, broadly U-shaped in lateral view. Apex narrowed and cleft. Pygofer process arising at about middle of ventral portion, very short, with a sharp pointed apex.

This is one of the smallest species of the group and was described from Florida specimens. It has since been collected in Virginia, North Carolina, Georgia, Mississippi, Louisiana and Texas. It will probably be found along the Gulf coast in Mexico.

CHLOROTETTIX VIVIDUS Crumb

Chlorotettix vividus Crumb, Anns. Ent. Soc. Am. 8: 197, 1915.

A small species, green tinged with brown and with distinct genitalia. Length 5.5–6 mm.

Vertex produced and distinctly angled, slightly conical, more than one and one-half times as long on middle as next the eye.

Color: Almost uniform brownish green, elytra subhyaline with more of a green tinge and with apical portion distinctly brown.

Genitalia: Female last ventral segment with posterior margin broadly, triangularly notched halfway to base of segment, with narrow apical notch. Male plates almost as broad as long, gradually, convexly narrowed three-fourths their length then produced to the same length as pygofer with margins almost parallel. Male plate long, triangular, narrowed before apex so as to form a long narrow tip. Style long, excavated on outer margin just before apex forming a long slender finger-like tip which curves outwardly. Aedeagus rather short, tapered from base to apex which bears a pair of short divergent processes.

This is one of the smaller species of the genus and is found in all of the Gulf states of the southeastern United States and is also reported for Arizona. It should occur in Mexico but no records are available at this time.

CHLOROTETTIX LUCIDUS Baker

Chlorotettix lucidus Baker, Psyche 7 (Suppl. 1): 12, 1895.

Chlorotettix delta Ball, Ent. News 27: 205, 1916.

Chlorotettix acus DeL. & Dav. Jour. N.Y. Ent. Soc. 42: 223, 1934.

A small species with a distinctly angled vertex. Length 4.5 mm.

Vertex strongly produced and angled, apex conical. One-third longer at middle than next the eyes. About one and one-half times as wide between eyes at base as median length.

Color: Pale green, apex of vertex and tips of elytra slightly tawny. Eyes dark.

Genitalia: Female last ventral segment with produced, rounded, lateral angles. Posterior margin broadly angularly excavated, the V-shaped notch extending about one-third the distance to base. Male plates long, slender, concavely rounded on outer margins. Apices narrow. Style broad at base gradually tapered to a shallow concave notch on outer margin just before apex. Tips sharply pointed. Aedeagus erect and enlarged at base, curved ventrally and extending caudally. Apex composed of a pair of short blade-like processes which curve outwardly and have pointed apices.

This is probably the smallest species of the genus occurring in the southwest and is known to be in southern California, Arizona and New Mexico and undoubtedly occurs in that portion of Mexico adjoining these states.

CHLOROTETTIX TETHYS V.D.

Chlorotettix tethys V.D. Buffalo Soc. Nat. Sci. 8: 71, 1907.

Chlorotettix bidentatus DeL. Jour. Dept. Agri. Porto Rico 7: 264, 1923.

Chlorotettix dilutus Osb. Anns. Carn. Mus. 15: 73, 1923.

A small green species with distinct genitalia. Length 5 mm.

Vertex produced and bluntly angled, almost twice as long at middle as length next the eyes, less than twice as wide between eyes at base as median length.

Color: Pale to dark green usually washed with yellow and often without markings. In well marked specimens with five brown spots on each elytron. A round spot on corium, a similar spot on outer claval vein, anterior to the spot on corium. A spot along commissure at about its middle, another just outside apex of clavus and the fifth is on the base of the long middle anteapical cell.

Genitalia: Female last ventral segment with produced lateral angles between which the posterior margin is broadly concavely rounded. At the middle of the concavity is a slightly produced portion bearing two slightly produced proximal teeth. The median margin of the segment heavily embrowned. Male plates short, broad, apices almost truncate, sloping from outer curved margins to straight inner margins. Style long, rather broad at base, gradually narrowed to rather wide, bluntly angled spines. Aedeagus long, rather slender, curved. In lateral view the basal half appears erect and the apical half curves ventrally and extends caudally. In ventral view the aedeagus is always tilted with the apical portion to the right.

A large series of specimens have been examined from Iguala, Gro., elevation 2398, September 11, 1939 and October 10, 1941; Mexcala, Gro., elevation 1706 ft., October 22, 1941; Tehuantepec, Oaxaca, elevation 328 ft., October 13, 1941 and Santa Engracia, Tamps., elevation 1050 ft., November 3, 1928, collected by Caldwell, Good, Plummer and DeLong. Specimens at hand from El Mante, Tamps., elevation 264 ft., August 9, 1930 (M.F. 1734) Carbel, Ver., August 3, 1932 (M.F. 2656) Santa Lucia, Chiap., July 29, 1926 (M.F. 1055); Chiapode, Corza, Chiapas, July 26, 1926 (M.F. 1047); Arcelia, Gro., August 17, 1930 (M.F. 1766) Parra; Pungarabato, Gro., August 22, 1930 (M.F. 1769); San Feronimo, Gro., August 30, 1930 (M.F. 1787); Huetamo, Mich., elevation 1100 ft., August 22, 1933 (M.F. 3100); Nainari, Sonora, August 12, 1927 (M.F. 1285) were collected by Dampf and Parra.

The holotype female specimens of *dilutus* Osb. from Columbia has been examined and cannot be distinguished from *bidentatus* DeL. which in turn is considered as a synonym of *tethys*. Allotype male from Iguala, Guerrero, September 11, 1939.

***Chlorotettix nigrolabes* n. sp.**

In general appearance resembling *tethys* but with distinct markings and genitalia. Length 5.5-6 mm.

Vertex bluntly angled and produced at least half its length before the anterior margins of the eyes, but only slightly longer on middle than next

the eyes due to strong curvature of pronotum. More than twice as wide as median length.

Color varying from apple green to pale brownish with darker markings. The greenish specimens usually have only the two round black spots on the basal margin of the vertex. The brownish specimens have the two black spots, a faint marginal line between ocelli another pale line just posterior to it between anterior margins of the eyes, the disc of scutellum brown, and brown basal angles of the scutellum. Elytra with dark brown spots along commissure and on disc.

Genitalia: Female last ventral segment with lateral angles produced and rounded. Posterior margin broadly, rather deeply notched, about half way to base. Apex with a black spot on each side. Male plates long, slender, concavely rounded on outer margins, apices narrow, bluntly rounded. Style broad at base deeply concavely excavated at two-thirds its length to form a narrow, sharply pointed, outwardly curved apex. Connective almost twice as long as aedeagus. The aedeagus is narrow, curved dorsally near apex and with four terminal processes two of which are longer than the other pair.

Holotype male, allotype female and male and female paratypes from Jiutepec, Morelos, elevation 3500 ft. September 6, 1939, by Plummer and DeLong. Male and female paratypes collected at Iguala, Guerrero, September 11, 1939, and October 25, 1941; Acapulco, Guerrero, elevation 328 ft., September 10, 1939; Tepotzlan, Morelos, September 11, 1941; Cuernavaca, Morelos, elevation 4921 ft., October 21, 1941; Lake Chapala, Jalisco, elevation 5000 ft. October 3, 1941; Guadalajara, Jalisco, elevation 5000 ft., October 3, 1941 and August 23, 1937 (Stone) collected by Caldwell, Plummer, Good and the author.

CHLOROTETTIX AURUM DeLong

Chlorotettix aurum DeL. Ohio Jour. Sci. 38: 218, 1938.

Resembling *suturalis* in general form and appearance but smaller with notched pygofer and four shorter terminal processes on oedagus. Length 7 mm.

Vertex roundedly produced, only slightly longer on middle than next the eye, about twice as broad as median length.

Color: Yellow, unmarked, elytra pale subhyaline, slightly darker along commissural line. Yellow beneath.

Genitalia: Male plates long, gradually tapered to rather acutely pointed apices. A brown mark in center of either plate at base as in *suturalis*. Male styles long and slender, apical half gradually tapered to blunt apices. Oedagus in lateral view curved, basal and apical ends directed dorsally. Pygofer notched on caudal margin, the portion dorsal to notch strongly

pointedly produced. Two pairs of brushes of heavy spines extend from wall of pygofer into genital chamber and almost obscure apex of oedagus. Two of these are attached just below the notch on ventral apical portion and two are attached to dorsal wall above and anterior to notch.

This is a low coastal species described from Carolina Beach, North Carolina. It may be found in the Gulf Coastal area of Mexico but has not been taken to date.

CHLOROTETTIX FLORIDANUS DeLong

Chlorotettix floridanus DeL. Jour.N. Y. Ent. Soc. 32: 66, 1924.

Chlorotettix rubidus Brown, Univ. Kan. Sci. Bul. 21: 246, 1933.

Resembling *galbanatus* in size and general appearance with vertex more rounded and genitalia different. Length 6 mm.

Vertex bluntly rounded, a little longer at middle than next the eyes and more than twice wider between eyes than length at middle. Pronotum more than twice as long as vertex. Elytra long, greatly exceeding abdomen.

Color bright green with a brownish iridescent tinge especially on elytra. Often washed with yellow.

Genitalia: Female last ventral segment twice as long as preceding, lateral margins roundingly produced from half their length to form a broad rounding lobe either side of a broad median somewhat U-shaped notch extending two-thirds the distance to base. The sides of the notch convexly rounded almost to apex where an abrupt broad V-shaped notch is formed. Notch at base broadly embrowned. Male valve almost twice as long as preceding segment, more than twice wider than long, almost rounded at apex. Plates exceeding valve by more than twice its length, gradually sloping almost to apex where they are convexly rounded to form rather blunt appressed apices. Styles long, rather broad, deeply roundedly notched on outer margin just before apex, forming a broadened, truncate apex which is curved outwardly. Aedeagus in lateral view broadly U-shaped with a long erect basal portion and the apical third forming a pair of long slender processes which extend dorsally. A straight heavy spine arises on the middle of the ventral caudal edge of pygofer.

This species was described from specimens collected in the coastal area of Florida. It has since been collected in Mississippi, Louisiana and Texas and probably occurs along the Gulf area of Mexico.

Chlorotettix bipartitus n. sp.

A species with a bluntly produced head, resembling *galbanatus* in general appearance. Length 6.5-7 mm.

Vertex produced, bluntly angled, less than twice as long at middle as length next the eyes, more than one-half as long at middle as basal width between the eyes.

Color: yellowish green without markings.

Genitalia: Female last ventral segment with produced lateral angles which are rounded to the posterior margin forming a rather broad lobe either side of the broadly deeply concavely rounded posterior margin. The median portion is slightly produced, black in color and has a small V-shaped notch at middle. Male plates short, broad, concavely emarginate near apex forming short blunt tips. Style broad at base, decidedly constricted and narrowed at less than its length, broadly, concavely notched just before truncate apex forming a pointed tooth on outer margin. Aedeagus long and slender. The base is thickened and erect. The apex forms two long slender processes which extend dorsally and laterally. Pygofer with a long straight spine extending from near middle to apical ventral margin at the apex of which is a short, dorsally curved hook.

Holotype male, allotype female and male and female paratypes collected at Iguala, Guerrero, elevation 2398 ft., October 25, 1941, by Good and DeLong. El Mante, Tamaulipas, elevation 264, October 26, 1930, Dampf (M.F. 1775); Santa Lucia, Chiapas, July 29, 1936, Dampf (M.F. 1055); Balsas, Guerrero, August 7, 1930, Dampf (M.F. 1754); Cocula, Guerrero, August 6, 1930 Dampf (M.F. 1753).

CHLOROTETTIX EMARGINATUS Baker

Chlorotettix emarginatus Bak. Can. Ent. 30: 219, 1898.

A yellowish, blunt headed species resembling *galbanatus* in general appearance but with distinct genitalia. Length 7.5-8 mm.

Vertex produced and bluntly angled more than twice as long at middle as length next eyes and more than twice as wide between eyes at base as median length.

Color straw yellow tinged with green often with a minute, darker spot either side on base. Elytra pale subhyaline usually with brown spots along commissural line.

Genitalia: Female last ventral segment with lateral angles produced forming long narrow finger-like processes between which the posterior margin, which is half-way to base, is roundedly excavated either side of a pair of median, rounded, prominent teeth which are separated by a short "V"-shaped notch. Male plates rather long, broad, scarcely narrowed to apices which are broadly rounded. Style short, broad at base, abruptly narrowed at about three-fourths its length then produced to form bluntly pointed apices which are bent inwardly. Aedeagus in lateral view thickened at middle and tapered at both ends. The anterior is narrow and bluntly rounded. The posterior end is elongated, tapered and divided, forming two slender terminal processes which curve dorsally and anteriorly. Pygofer with a long, heavy strongly curved pygofer spine which arises on the ventro caudal margin curving caudally, dorsally then anteriorly.

A large series of specimens are at hand collected at Iguala, Gro., September 11, 1939, and October 25, 1941, by Plummer, Good and DeLong. From Vergel, Chiap., elevation 3000 ft. June 4, 1935 (M.F. 4431); Santa Lucia, Chiap., July 29, 1926 (M.F. 1055); El Mante, Tamps., elevation 264, October 26, 1930 (M.F. 1775); Pandancuareo, Gro., August 28, 1930, (M.F. 1785) collected by Dampf.

CHLOROTETTIX NUDATUS Ball.

Chlorotettix nudatus Ball. Can. Ent. 32: 340, 1900.

Resembling *gallanatus* in general appearance but with distinct genitalia. Length 6-6.5 mm.

Vertex produced and bluntly angled, one-third longer on middle than length next eyes, less than twice as wide between eyes at base as median length.

Color yellowish green without markings.

Genitalia: Female last ventral segment with produced lateral angles which are rounded to posterior margin forming a broad deep V-shaped notch reaching almost to base. The caudal portion is broad with the sides concavely rounded, the cephalad portion is narrowed to a brown bordered slit. Male plates broad at base tapered to sharp pointed apices. Style long, bent sharply inwardly at two-thirds its length, apex bluntly pointed. Aedeagus short and thick with a basal, slender, dorsally produced portion. In lateral view the dorsal surface seems deeply narrowly excavated just before the apex. In ventral view the apex is bifid with a short process curving laterally on each side. Pygofer with a long narrow spine arising on ventral margin just beyond the center and extending ventrally and caudally.

One male specimen was collected at Finca, Esperanza, Chiapas, Mexico, June 23, 1938, by Nettel (M.F. 6934) and a female collected at Valles, S. L. P., Mexico, September 24, 1941, by Good, Caldwell and DeLong.

CHLOROTETTIX LOBATUS Osb.

Chlorotettix lobatus Osb. Ohio State Univ. Bul. 23: 17, 1919.

Resembling *emarginatus* in general appearance but with distinct genitalia and a less produced vertex. Length 7.5-8 mm.

Vertex bluntly angled, only slightly longer at middle than length next the eyes, more than twice as wide between eyes at base as median length.

Color pale yellow to pale brown with distinct or slight markings. The vertex has a dark brown narrow transverse line between anterior margins of the eyes. Pronotum with a series of dark brown irregular spots just posterior to anterior margin. Scutellum with a median anterior brown spot and a spot on each basal angle. Elytra pale brown subhyaline, with darker brownish markings along commissural line and with brownish spots on corium. The veins of second wing brown often visible through the elytra. Face with darker arcs either side of a pale median area.

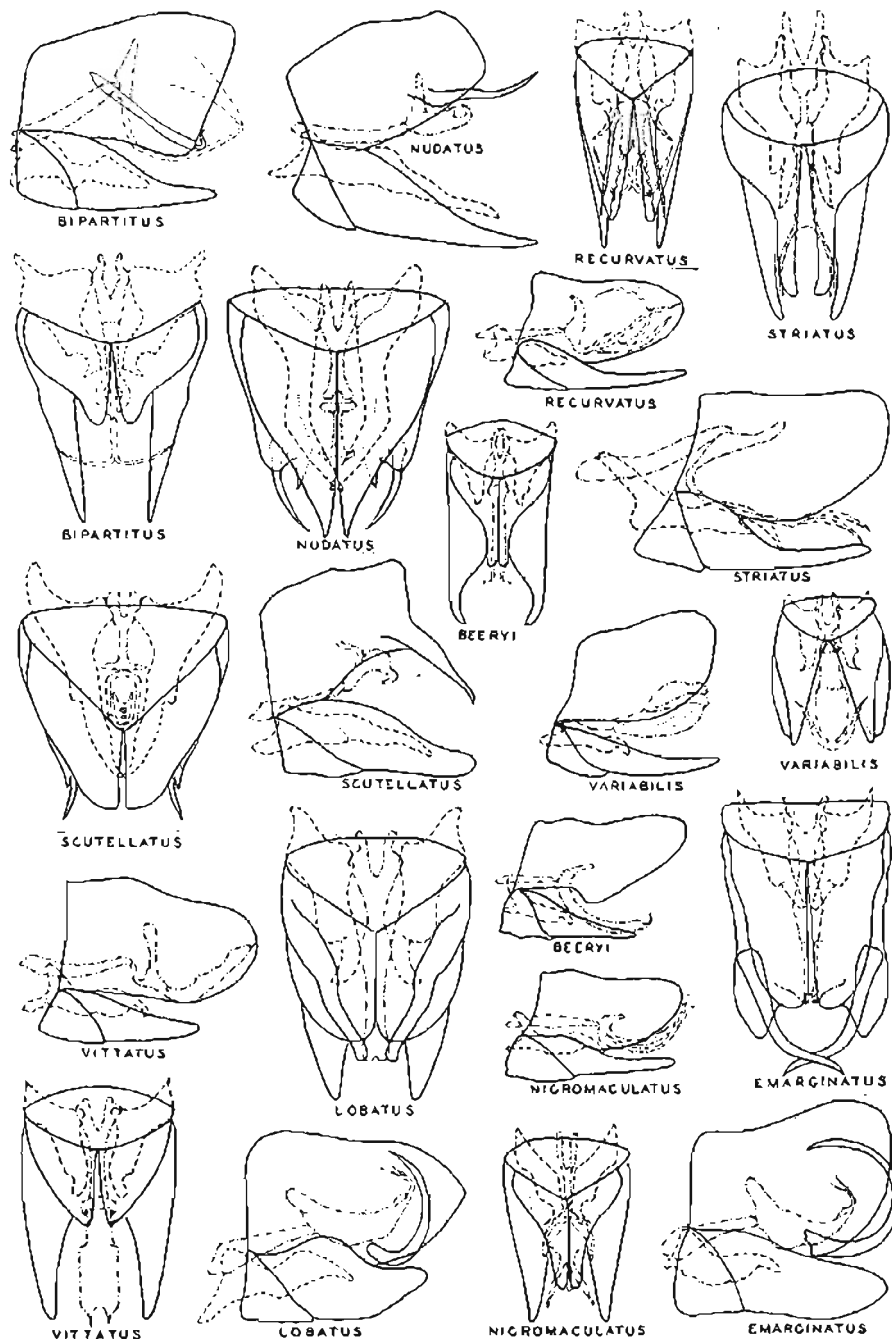


PLATE 3.—Lateral and ventral views of male genital structures in normal position, of species as labeled.

Genitalia: Female last ventral segment produced, forming a broad lobe either side of a median U-shaped notch the sides of which are almost straight. The lobe is longest on the outer rounded angle, then slopes slightly anteriorly to the sides of the notch. Male plates convex on outer margin broadly rounded at apices. Style broad at base abruptly narrowed on outer margin at three-fourths its length and produced on inner margin to form rather long thick finger-like processes. Aedeagus in lateral view appearing convexly rounded on ventral margin somewhat concave on dorsal margin, narrowed just before apex and with a bifid apex. A slender pygofer process arises at two-thirds its length on ventral portion and curves caudally and dorsally almost to dorsal margin. Pygofer rather long, bluntly angled.

This species was described from a single female specimen collected at Gualan, Guatemala and the male is described here for the first time. Male allotype taken at Fortin, Ver., Mexico, October 9, 1941, by Good, Plummer, Caldwell and the author. Specimens are at hand from Fortin, elevation 3281, and Cordoba, elevation 3060, Ver.; Tierra Blanca, Vera Cruz, July 29, 1932 (M.F. 2655) Dampf. Vergel, Chiapas, May 16, 1935 (M.F. 4193) elevation 3000 ft.; Finca Prusia, Chiapas, December 5, 1932 (M.F. 2869); Jalapa de Diaz, February 16, 1932, Oaxaca (M.F. 2267); San Miguel, Chimalapa, Oaxaca (M.F. 2509); Pungarabato, Guerrero, August 22, 1930 (M.F. 1769); Buena Esperanza, Guatemala, December 14, 1925 (M.F. 898) and Cantetul, Guatemala, Dec. 11, 1925 (M.F. 878).

CHLOROTETTIX CURVIDENS Osb.

Chlorotettix curvidens Osb. Ohio State Univ. Bul. 23: 16, 1919.

Chlorotettix serratus DeL. Ent. News 48: 52, 1937.

A rounded headed species with few color markings. Length 6.5 mm.

The vertex is scarcely longer at middle than next the eye.

Color: Straw yellow to yellowish green with a pale brown line on each basal angle of scutellum and brown spots along posterior margin of elytra on clavus. Some specimens are pale without markings.

Genitalia: Female last ventral segment with lateral angles strongly produced and bluntly angled. Between these the posterior margin is strongly, broadly notched forming a V-shaped notch almost to base. A brown coloration at about half its length causes it to appear notched on each side. Male plates long, gradually tapered to pointed apices. Style broad at base, constricted at middle and deeply narrowly notched at two-thirds its length to form a narrow terminal portion which is truncate at apex and slopes obliquely outwardly from center. Aedeagus short, thickened at base; apical half narrowed, the tip in the form of a hook which curves dorsally.

It was taken in abundance at Tamazunchale, S. L. P., elevation 687 ft. August 29, 1939 and September 25, 1941; Valles, S. L. P., elevation 312, September 25, 1941; Jesus Carranza, Ver., October 14, 1941 and Suchilapa, Oax., October 11, 1941, by Plummer, Caldwell, Good and DeLong. Specimens are also at hand from Tierra Blanca, Ver., July 29, 1932 (M.F. 2655); La Forestal, Veracruz, Ver., October 14, 1926 (M.F. 1066); Vergel, Chiap., elevation 3000 ft., May 28, 1935 (M.F. 4321); Finca Esperanza, Chiap., August 2, 1939 (M.F. 6811); Yetla, Gro., August 11, 1930 (M.F. 1756); Cuantla, Mor., elevation 2500 ft., September 2, 1937 (M.F. 6259); Frontera, Tabasco, June 9, 1928 (M.F. 1357) by Dampf.

CHLOROTETTIX SCUTELLATUS Osb.

Chlorotettix scutellatus Osb. O.S.U. Bull. 23: 18, 1919.

Chlorotettix pallidus Brown, Univ. Kan. Sci. Bull. 21: 245, 1933.

A species variable in color, with a slightly produced vertex and distinct genitalia. Length 6-6.5 mm.

Vertex bluntly produced, about one-fourth longer at middle than length next eyes.

Color: Well marked specimens are pale brown with a narrow brown line between the anterior margin of the eyes. A dark brown longitudinal band forming an elongated spot on each basal angle of the scutellum and extending under the pronotum to about its middle, visible through the pronotum. Elytra pale brownish subhyaline, with darker brownish markings along the commissural margin on clavus. In pale specimens the color is greenish yellow without markings.

Genitalia: Female last ventral segment with the lateral margins produced forming bluntly rounded lateral angles between which the posterior margin is broadly angularly excavated with the apex rounded. Male plates rather broad, convexly rounded on outer margin, apices broad convexly rounded to inner margin. Style long, gradually tapered from broad base to narrow pointed apex except for a slight abrupt narrowing on outer margin at more than half its length. Pygofer with a long tapering spine on caudoventral margin directed caudoventrally. Aedeagus short, convexly rounded caudally to produce a short curved process on ventral caudal portion which curves anteriorly and is pointed at apex.

Pallidus is undoubtedly a pale form of *scutellatus* because the male and female genitalia are identical.

Specimens have been examined from Santa Engracia, Tamps, elevation 1050 ft. November 8, 1938 (Caldwell); Valles, S. L. P., elevation 312, November 7, 1941; Cuantla, Mor., elevation 3500 ft., September 9, 1937 (M.F. 6289) Dampf; Matamoras, Tamps, July 21, 1930 (M.F. 1772) Dampf; Montemorelos, N. Leon., June 3, 1930 (M.F. 2022) Dampf.

CHLOROTETTIX VITTATUS Osb.

Chlorotettix vittatus Osb. Ohio Naturalist 9: 465, 1909.

A white to cream yellow species with brown oblique vittae on the elytra. Length 7-7.5 mm.

Vertex broad, rounded, only slightly produced. About one-fourth longer at middle than length next eyes almost twice as wide between eyes at base as median length.

Color white to cream, vertex and pronotum with darker areas but without definite markings. Scutellum with a large dark brown spot on each basal angle and a median longitudinal brown stripe. Elytra white with four or five oblique or longitudinal brown stripes. Two oblique lines are on

the clavus; another oblique line extends from the corium to the cross vein of the third apical cell. A short line parallel to the costa on the anterior portion of the elytron is on the anterior branch of the first sector. Two short lines on the posterior portion, which are sometimes faint or missing, extend across the first and second anteapical and apical cells.

Genitalia: Female last ventral segment broadly shallowly concavely rounded between the produced lateral angles. The central third of the margin embrowned. Male plates short, triangular with bluntly pointed apices. Style broad at base, narrowed to half its basal width at one-third its length and slightly notched on outer margin, just before the rounded apex. Aedeagus narrow at base with a long conspicuous dorsal process near base. Apical portion thickened, curved dorsally, the apex notched by a U-shaped excavation so as to form a pair of pointed terminal teeth.

Specimens are at hand from Jesus Carranza, Ver., elevation 200 ft., October 14, 1941, collected by Plummer, Good, Caldwell and DeLong; and from Veracruz, Ver. during November and December, 1926 (M.F. 1112 and M.F. 1117). Collected by Dampf. This species has been found only in the low altitude tropical vegetation.

***Chlorotettix striatus* n. sp.**

A blunt headed species resembling diminutive specimens of *vittatus* but with distinct genitalia. Length 5.5–6 mm.

Vertex blunt, rounded, scarcely longer at middle than length next the eyes and produced about one-half its length before the anterior margins of the eyes.

Color pale brown with darker mottling on the anterior margin of pronotum and basal angles of scutellum with dark brown spots. Elytra with pale veins giving them a distinctly striated appearance.

Genitalia: Female last ventral segment almost truncate slightly produced to middle where it is notched more than halfway to base with a narrow V-shaped notch. Male plates long, broad at base strongly convexly narrowed at half their length and produced as slender almost parallel sided tips to the rounded apex. Style long bent inwardly at middle and rather deeply narrowly notched at three-fourths its length to form a narrow apical finger-like tip which is sharp pointed. Pygofers exceeding plates.

Holotype male collected at Vergel Chiapas, elevation 3000 ft., May 17, 1935 (M.F. 4196) by Dampf. Allotype female collected at Tolosa, Oaxaca, January 1, 1932 (M.F. 2512) by Parra.

CHLOROTETTIX LUTEOLUS Baker

Chlorotettix luteolus Baker, Phillip. Jour. Sci. **30**: 347, 1926.

Chlorotettix luteus Osb. Ann. Carn. Mus. **15**: 425, 1924.

A yellow species with brownish markings and a rounded vertex. Length 6.5–7 mm.

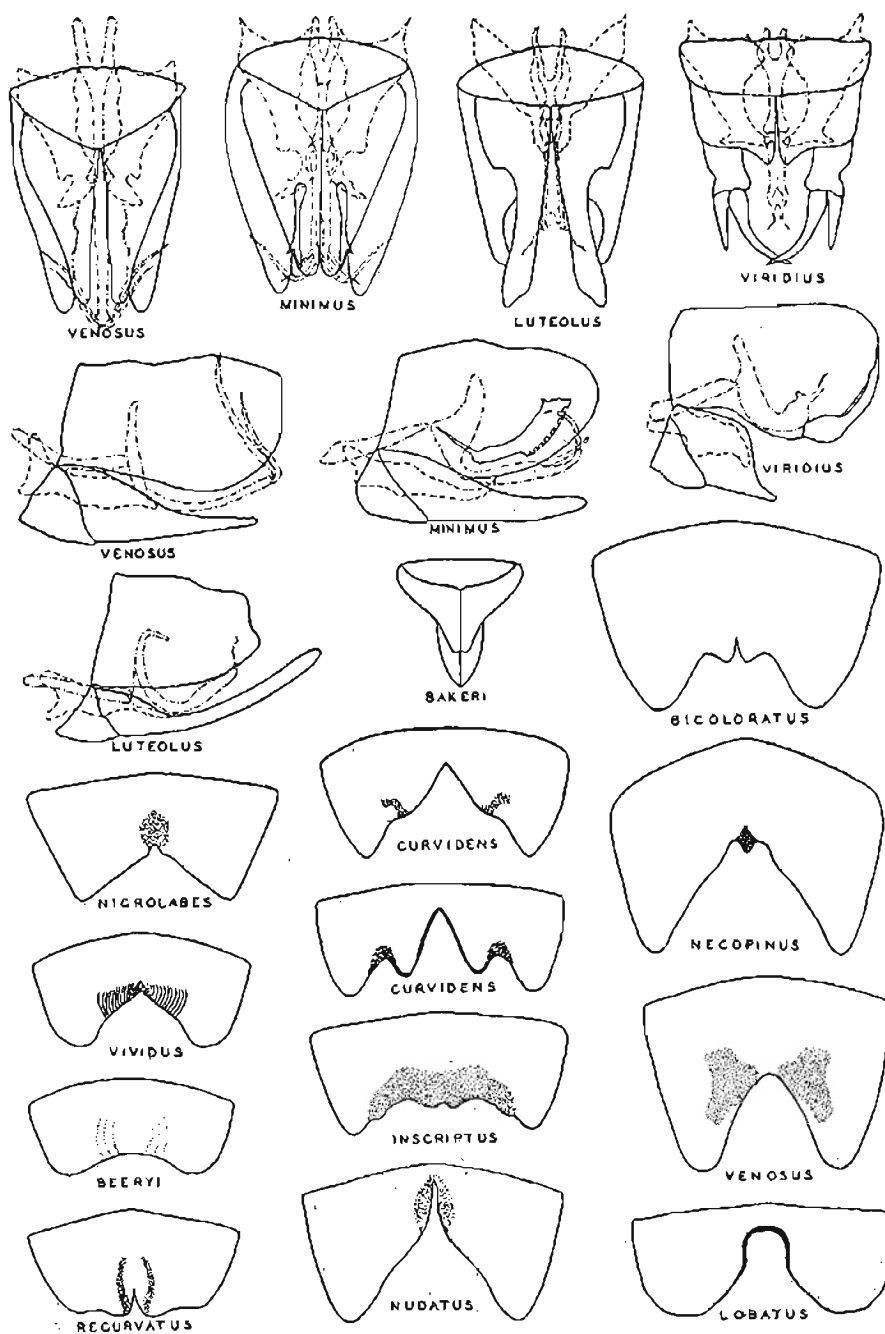


PLATE 4.—Upper portion—lateral and ventral views of male genital structures in normal position, of species as labeled. (Central figure of bakeri is ventral view of external male plates.) Lower portion—ventral views of last ventral segments of females as labeled.

Vertex broad, almost rounded, produced about half its length before the anterior margins of the eyes, scarcely longer at middle than next the eyes, more than twice as wide between eyes at base as median length.

Color pale yellow, pronotum with some darker longitudinal markings which appear as a continuation of the spots on basal angles of scutellum. Elytra yellow with a black mark on commissure just beyond the apex of clavus. Pale brownish markings along commissure on clavus, an oblique brown line between claval veins at base and one along claval suture. A pale brown line extends from base to apex about equidistant between claval suture and costal margin. A shorter, paler line is often between this and costa. Face with faint traces of darker arcs.

Genitalia: Female last ventral segment with produced rounded angles, posterior margin appearing shallowly excavated with a short rounded lobe either side of a shallow, V-shaped median notch. Male plates long, convexly rounded to one-third their length then broadly convexly emarginate forming narrowed apical portions which are longest on outer margin forming blunt apices which slope to inner margin. Style long, tapering to blunt apex which slopes inwardly. Aedeagus bent upwardly at base, apical portion notched forming a filamentous process each side which extends dorsally.

This small species was described from Uruguay and has since been collected in Brazil. It has not been taken in Mexico. The allotype female as described at this time is from Vicosá, Brazil, collected in November, 1929, by Edson Hambleton.

CHLOROTETTIX NIGROMACULATUS DeL. & Wolcott

Chlorotettix nigromaculatus DeL. & Wolc., Jour. Dept. Agr. Porto Rico 7: 265, 1923.

A short round headed species, yellowish green with brown markings. Length 4.5 mm.

Vertex rounded, scarcely produced, slightly longer on middle than next the eyes and almost twice as wide between eyes at base as median length.

Color: Vertex yellowish green, ocelli large, reddish, a transverse brown band just above ocelli. A pair of large round black spots on rounded margin just below ocelli. Face yellowish with slight traces of arcs. Pronotum yellowish unmarked. Scutellum with a large, triangular dark brown spot in each basal angle which extends under the pronotum. Elytra white, hyaline, nervures white, two oblique brown stripes on inner clavus between veins and a broader one between claval vein and corium.

Genitalia: Female last ventral segment with lateral angles produced, posterior margin shallowly concavely rounded and slightly notched at middle. A median brown stripe extends to base of segment. Male plates long, concavely rounded on outer margins, apices narrow, rounded at tip. Style distinctly excavated on outer margin just before apex forming a

pointed tip which is bent outwardly. Aedeagus with a short erect basal portion. The ventral portion bears a central process and a pair of longer processes which are divergent and appear twisted near the end.

The species was described from a female from Porto Rico and the male allotype described at this time is from Panama, Canal Zone. No definite records for Mexico are at hand but it should occur either in the state of Chiapas, Oaxaca or Guerrero.

***Chlorotettix berryi* n. sp.**

A small species resembling *vacunus* in general appearance but with distinct genitalia. Length 5.5 mm.

Vertex bluntly angled one-third longer at middle than length next eyes, more than half as long at middle as basal width between the eyes.

Color dull yellow, unmarked.

Genitalia: Female last ventral segment roundedly emarginate on central half of posterior margin. Male plates concavely rounded to form narrow apices which are rounded at tips. Style short, broad at base and with narrow blunt apex. Aedeagus rather narrow, curved, in lateral view with the basal end curved upward. The apex is notched so as to form a pair of short slender terminal processes which are tapered to pointed apices and curve dorsally and laterally.

Holotype male and allotype female collected at Santarem, Brazil, October, 1942, by Laurence Berry. I take pleasure in dedicating this species to Mr. Berry who has collected many interesting species in Brazil.

CHLOROTETTIX MINIMUS Baker

Chlorotettix minimus Baker, Can. Ent. 30: 220, 1898.

Chlorotettix lineatus Osb., Ohio State Univ. Bul. 23: 5, 1919.

A small blunt headed species with distinct male and female genitalia. Length 4.5-5.5 mm.

Vertex bluntly angled, scarcely produced, a little longer at middle than length next the eyes.

Color dull yellowish slightly tinged with smoky.

Genitalia: Female last ventral segment somewhat variable. The posterior margin with a deep narrow notch reaching almost to base, either side of which is a rather sharp produced tooth. The lateral angles are produced and rounded to the gently sloping posterior margin which is slightly emarginate either side of the produced teeth. Male plates almost as long as pygofer, triangular, convexly rounded on outer margin. Style elongate, deeply, convexly emarginate on outer margin near apex, forming a narrow sharp-pointed apex which is curved sharply outwardly. Aedeagus with four slender processes at apex; two are short and straight and two are longer,

curved outwardly and dorsally, and the apices are bent cephalad. A conspicuous pygofer process arises near base and extends caudodorsally. The ventral margin is serrate.

This is a low altitude tropical species. Specimens taken in Mexico are at hand from Tierra Blanca, Ver., July 29, 1932 (M.F. 2655); and Loma Bonita, Oax., June 8, 1937 (M.F. 6070A). It is common in Brazil, through most of Central America and authentic records show it occurs in Florida.

***Chlorotettix variabilis* n. sp.**

Resembling *minimus* in size and general appearance, with distinct genitalia. Length 3.5-4 mm.

Vertex bluntly angled, more than one-half wider between eyes at base than median length.

Color yellowish green. Certain specimens are conspicuously marked with dark brown or black on central half of pronotum, scutellum and on elytra along commissure to apex of clavus.

Genitalia: Female last ventral segment with lateral angles produced between which the posterior margin slopes basally to a rather broad, short truncated median tooth which is produced to about the length of the lateral angles. Male plates long, narrowed on apical half to narrow blunt apices. Styles rather short, slightly concavely excavated on outer margins just before apex to form a sharply pointed tip on outer margin. Aedeagus short, broad, in lateral view appearing inflated with a pair of long apical processes arising on ventral side and extending basally on each side.

Holotype male collected at Pcvicuc, Tab., June 16, 1938 (M.F. 6566). Allotype female collected at Frontera, Tab., June 7, 1928 (M.F. 1357). Male and female paratypes from same localities and from Zapata, Tab., July 1938 (M.F. 6859); Yaquin Valley, Sonora, Mex., Nov. 19, 1935 (M.F. 3980); Pandancuareo, Gro., August 28, 1930 (M.F. 1785); and San Jose, Guat., Nov. 14, 1925 (M.F. 801) all collected by Dampf and his co-workers.

***Chlorotettix recurvatus* n. sp.**

Resembling *minimus* in general form and appearance but with dark band across vertex and with distinct genitalia. Length 4.5 to 5.5 mm.

Vertex blunt, rounded, one-fourth longer than length next eyes, more than twice as wide between eyes as median length.

Color yellowish marked with pale brown. A transverse brown band on vertex just above ocelli. Elytra with pale veins, margined with brown, giving the elytra a striped appearance. Face yellowish with pale brownish arcs one either side of middle.

Genitalia: Female last ventral segment almost truncate on posterior margin with a short narrow incision at middle reaching about one-fourth

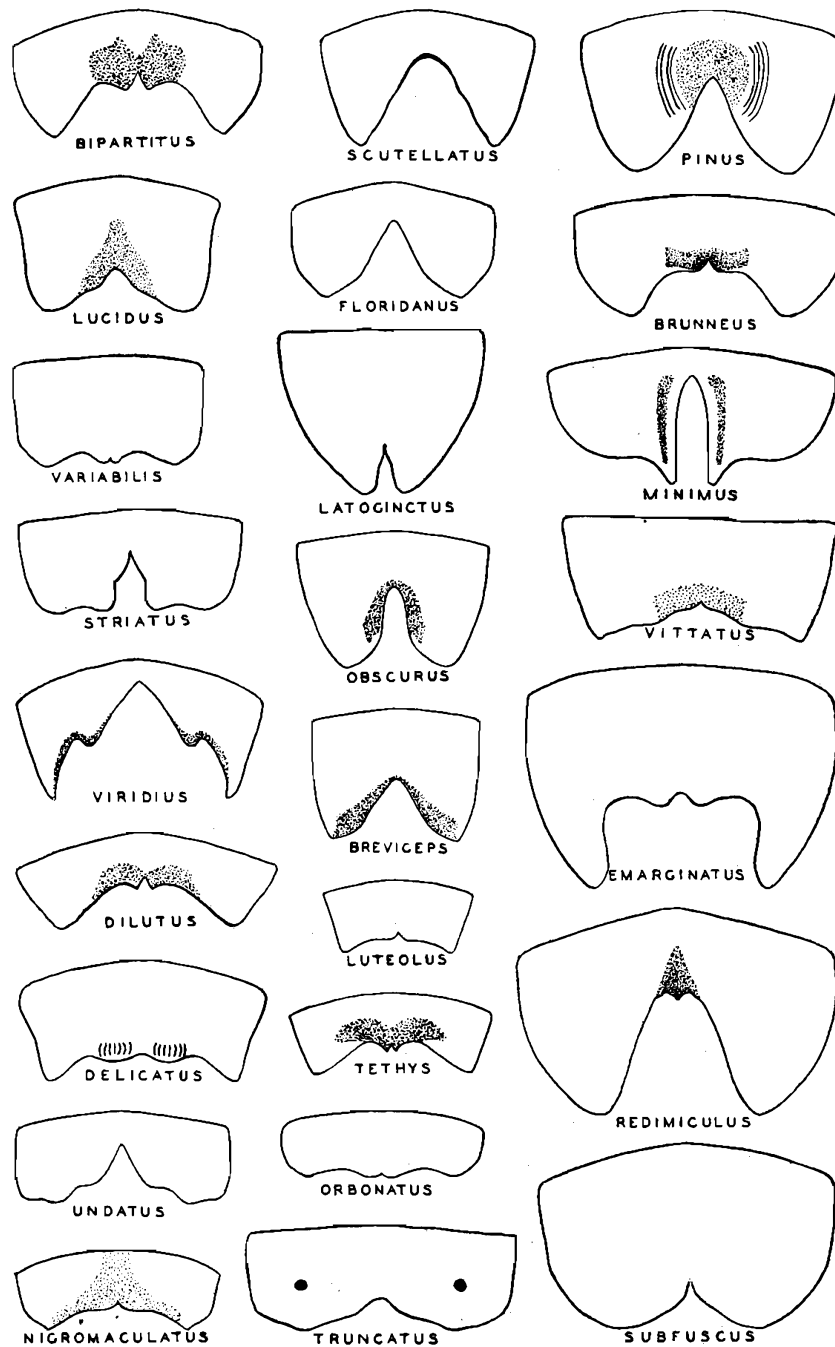


PLATE 5.—Ventral views of last ventral segments of females as labeled.

the distance to base. Male plates long, gradually narrowed to a rounded apex. Style abruptly deeply excavated just before apex forming a long slender pointed outwardly bent apex. Aedeagus with an erect swollen basal portion at the ventral end of which the apical three-fourths is bent caudally. A pair of straight processes arise, one on either side, and extend caudally. The apex of the aedeagus is bifid, forming two long slender processes which curve dorsally then anteriorly. A long straight pygofer process arises near the base and extends to the end of pygofer.

Holotype male and allotype female collected at Loreta Mission, Argentina, December, 1931, by A. A. Ogoblin.

***Chlorotettix undatus* n. sp.**

Resembling *minimus* in general appearance but with distinct female genitalia. Length female, 5.5 mm.

Vertex blunt, rounded, only slightly longer at middle than length next the eyes and more than twice as wide between eyes as median length.

Color yellowish green unmarked.

Genitalia: Female last ventral segment with a rather broad V-shaped median notch extending about two-thirds the distance to base. Posterior margin with a slight excavation on either side of notch, lateral angles rounded.

Holotype female collected at Loma Bonita, Oaxaca, June 8, 1937 (M.F. 6070A). Paratype females from Tierra Blanca, Ver., July 29, 1932 (M.F. 2655) all collected by Dampf. This is apparently a low altitude species.

CHLOROTETTIX BAKERI Sand. & DeL.

Chlorotettix bakeri Sanders & DeL., Proc. Ent. Soc. Wash. 24: 97, 1922.

Resembling *minimus* in size and general appearance but with distinct male genitalia. Length 5 mm.

Vertex scarcely longer at middle than next the eyes and two and one-half times as broad between eyes at base as median length.

Color: Yellowish green without markings.

Genitalia: Female last ventral segment with lateral angles broadly rounded to posterior margin which is broadly and roundedly notched one-third the distance to the base. Male valve broadly and evenly rounded, plates about four times as long as valve, broad at base, tips narrow and rounded.

The holotype male and allotype female labeled "Columba, Brazil, May" are in the National Museum. This species has not been taken in Mexico.

CHLOROTETTIX BREVICEPS Baker

Chlorotettix breviceps Baker, Can. Ent. 30: 220, 1898.

A broad, rounded headed species without color markings. Length 6.25 mm.

Vertex broadly rounded, parallel margined, almost four times as broad between eyes at base as median length.

Color pale brownish with two longitudinal white lines on scutellum.

Genitalia: Female last ventral segment with rather prominent lateral angles between which the posterior margin is broadly notched about one-half the distance to base. Margins of notch heavily embrowned especially next lateral angles.

This species is known by two female type specimens collected at Chapoda, Brazil. No specimens have been collected in Mexico.

