

The Genus *Graminella* (Homoptera-Cicadellidae)



DWIGHT M. DeLONG
and
CARL O. MOHR



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Dwight M. DeLong and Carl O. Mohr

The genus *Graminella* DeLong was recently erected to include a group of small species which are common on fresh water marsh and salt marsh vegetation and a few of which occur on wet prairie grasses.

Two new species are described in this genus and ten previously described species are treated. The head, external male and female characters and, for the first time, the male internal genital characters are here described and illustrated. They will assist in a better understanding of the similarities and differences of these species. Since most of the species can be separated on the basis of color characters these are used in all possible cases in the following key but the genital structures will be of value in verifying the identity of the various species.

KEY TO SPECIES OF GRAMINELLA

- 1 Vertex, pronotum and scutellum with broad longitudinal red stripes-----2
- 1' Without red longitudinal stripes on vertex, pronotum and scutellum-----4
- 2 (1) Vertex with a narrow black line on lateral margin, elytra with red longitudinal stripes -----*texana*
- 2' Vertex without marginal black line, elytra without red stripes -----3
- 3 (2') Four large black spots just above margin of vertex -----*floridana*
- 3' Ocelli black and a pair of small black spots at apex of vertex --*aureovittata*
- 4 (1') Vertex marked with two or more black spots or bars -----5
- 4' Vertex without black spots, sometimes with faint brownish markings ----10
- 5 (4) Vertex marked with two broad black transverse bars which almost touch on middle line and are produced anteriorly to apex of vertex----*bisignata*
- 5' Vertex marked with marginal spots, without transverse bars -----6
- 6 (5') Vertex with four marginal dark spots, outer ones at least, black, usually large, of about equal size, species northern in distribution -----7
- 6' Vertex with two or four marginal spots, but central spots, if black very small in size or if larger oblique in form and paler in color, not black, southern in distribution -----8
- 7 (6) Size larger 4.5 mm. spots large, conspicuous, female segment with broad, median sunken tooth, male plates one half longer than combined basal width, apices pointed -----*fitchii*
- 7' Size not exceeding 4 mm. paler in color, ocelli black, spots often faintly marked, female segment concavely rounded without tooth, male plates as long as combined basal width -----*pallidula*
- 8 (6') Vertex wider between eyes than median length, apex rounded, spots at apex of vertex black and minute -----9
- 8' Vertex more strongly angled, as long at middle as basal width, ocelli

- black, a large black spot anterior to each and a pair of oblique brown dashes at apex ----- *nigrinota*
- 9 (8) Outer pair of spots on vertex large, pair at apex very minute, usually represented by a pair of black points ----- *virginiana*
- 9' Spots of vertex small and approximately same size. Ocelli black, of about same size and appearing as two additional spots ----- *plana*
- 10 (4') Male plates as long as combined basal width tapered to pointed apices, female with a round median tooth on last ventral segment, southern in distribution ----- *albovenosa*
- 10' Male plates decidedly shorter than combined basal width, apices more blunt, northern in distribution ----- 11
- 11 (10') Female segment with a prominent sunken tooth, apical portion of male oedagus concavely emarginate on ventral side before apex, large black tooth on upper apical portion ----- *mohri*
- 11' Female segment concavely rounded without tooth, male oedagus concave on dorsal surface, a small black tooth on ventral median portion ----- *oquaha*

Graminella pallidula (Osborn)

Thamnotettix pallidulus Osb. Proc. Ia. Acad. Sci. 5:245, 1898.

A pale yellow species with six small black dots in a row above margin of vertex. Length 4 mm.

Vertex bluntly, rounded angled, one and one half times as wide between eyes at base as median length.

Color: Yellow, with faint ochraceous stripes, vertex with a row of six black dots, those at middle above margin and sometimes obsolete, the outer ones on margin anterior to eyes. Elytra pale brown or tawny, nervures paler, conspicuous.

Genitalia: Female last ventral segment with posterior margin broadly and deeply excavated, bearing an obtuse tooth at its apex. Male plates convexly narrowed to acute apices, styles broad with two anterior processes which are directed outwardly. Oedagus in ventral view tapered to bluntly rounded apex. In lateral view broad at base, tapered to a very narrow neck just before a rounded bulbous apex.

Originally described from specimens collected at Ames, Iowa. These have been used in the present study, but no other specimens are available.

Graminella mohri DeLong

Graminella mohri DeL. Ent. News 48:50, 1937.

A yellowish blunt headed species without dark markings. Length 4 mm.

Vertex bluntly angled, about one-third wider between eyes than length at middle.

Color yellowish unmarked, veins of elytra not conspicuous.

Genitalia: Female last ventral segment shallowly, roundedly excavated on either side of broad, rounded median tooth. Central half of segment en-browned. Male plates short and broad gradually narrowed to blunt apices.

Style rather narrow with a long basal process. Oedagus in ventral view broad at base slightly tapered to apical third then enlarged, apex bearing a broad deep U-shaped notch on either side of which is a blunt pointed apical process which is abruptly set off from body of oedagus at base. In lateral view the apical portion is constricted at base on ventral side then enlarged, apex broadly rounded, a large black spine on anterior apical margin.

Originally described from specimens collected at Presque Isle, Pennsylvania, Zion and Thomson, Illinois. These specimens have been used for this study.

Graminella oquaka DeLong

Graminella oquaka DeL. Ent. News 48:51, 1937.

A pale yellow species with black ocelli. Length 4 mm.

Vertex bluntly angled, about one-third wider between eyes than length at middle.

Color yellow, ocelli black, indications of four very pale spots on margin of vertex. Elytra yellowish subhyaline, venation indistinct.

Genitalia: Female last ventral segment with central half of posterior margin broadly roundedly excavated about one-fourth the distance to base at the apex of which is a slightly produced broad median tooth. Male plates rather short, broad at base, rather gradually narrowed to acute apices. Style broad, the apical process long, curved outwardly. Oedagus in ventral view rather broad, slightly broader on apical third. Apex broadly deeply excavated by a U-shaped notch forming two diverse pointed apical processes which are broadened toward base and abruptly set off from body of oedagus. In lateral view the apical third is broadened, rounded on ventral surface, apex bluntly rounded, a black tooth on median ventral portion.

Originally described from specimens collected from prairie grasses at Oquaka, Illinois. The type specimens have been at hand for this study but no other records are available.

Graminella albovenosa (Sanders & DeLong)

Thamnotettix albovenosus S. & DeL. Proc. Ent. Soc. Wash. 25:153, 1923.

A brownish species without dark marking on vertex. Length 3.5-4 mm.

Vertex bluntly angled, a little wider between eyes than length at middle.

Color: Pale brown, vertex with ocelli black and a pair of faint brownish spots at apex of vertex. Elytra brownish with pale nervures.

Genitalia: Female last ventral segment with short lateral margins then sloping to posterior margin which is faintly trilobate. Underlying membrane conspicuous at either side of segment. Male plates long, narrowed and tapered to long narrow apices. Oedagus in ventral view broad at base, tapered to a narrow slightly bifid apex. In lateral view broad on basal two-thirds then abruptly narrowed to form a long slender apical process.

Originally described from specimens collected at Paradise Key, Miami

and LaBelle, Florida. Specimens are also at hand from Gainesville, Florida, and a large series from Belle Glade, Florida.

Graminella texana (Osborn & Ball)

Athysanus texanus Osborn & Ball. Proc. Dav. Acad. Sci. 7:92, 1898.

Vertex obtusely angled, a little longer on middle than width between eyes. Length 4-5 mm.

Color: Vertex pale with a narrow black line on anterior margin, a pair of black spots above apex and a pair of broad, parallel longitudinal red stripes arising just back of margin and extruding across vertex pronotum and scutellum. Elytra with three pairs of red strips, the inner pair are a continuation of those on scutellum.

Genitalia: Female last ventral segment with posterior margin roundedly produced from near base the lobes of underlying membrane exposed at sides. Male plates rather long, sides gradually narrowing to acute tips. Male oedagus rather broad, slightly constricted at middle, apex with a deep and broad U-shaped notch, forming a pair of sharp pointed apical processes. In lateral view broad at base narrowly constricted just before apex which is slightly roundedly enlarged.

Known to occur only in Texas and Louisiana.

Graminella floridana sp. nov.

In general appearance and coloration resembling *aureovittata* but larger with more produced head and different markings. Length ♀ 4.5 mm.

Vertex broadly bluntly angled, almost rounded at apex, about one-fourth wider between eyes than length at middle, produced about one-third its length before anterior margins of eyes. Elytra long, greatly exceeding abdomen.

Color: Face pale, vertex yellowish with a row of four large black spots just above margin. The central pair are linear. A broad red band extends from apex of vertex to apical margin of scutellum either side of pale apex and does not cross basal angles. Elytra tawny in color, veins conspicuously pale.

Genitalia: Female last ventral segment with posterior margin truncate, central third broadly roundedly excavated and broadly margined with brown. Ovipositor brown.

Described from a series of seven female specimens collected at Belle Glade, Florida, during the summer of 1929 by Mr. Hugh Clifton. Holotype female and paratype females in collection of senior author.

Graminella aureovittata (Sanders & DeLong)

Thamnotettix aureovittatus S. & DeL. Penn. Dept. Agr. Bur. Plant Ind. Bul. 346, p. 16, 1920.

Vertex broadly rounded, one-fourth wider than long and only slightly produced before outer margins of eyes.

Color: Ocelli black and a pair of small triangular black spots at apex.

The two bright red longitudinal bands cover almost entire vertex on anterior margin but are narrowed on pronotum and scutellum. Elytra brownish with paler veins.

Genitalia: The female segment is rather deeply roundedly excavated on median half of posterior margin and brown bordered. The underlying segment shows conspicuously at lateral edges of last ventral segment. Male plates short and broad, rounded. Male oedagus in ventral view broadened at apex and narrowly notched. In lateral view it is tapered to a pointed apex.

Described from specimens from Big Bayou and St. Petersburg, Florida. Additional specimens are at hand from Paradise Key, Florida, Plymouth, Mass., and several localities in the Chicago Illinois area where it has been taken on the wet prairies.

Graminella plana (DeLong)

Thamnotettix planus DeL. Jour. N. Y. Ent. Soc. 32:65, 1924.

A yellowish species with a row of four black spots on anterior margin of vertex. Length 3.5-4 mm.

Vertex bluntly angled, one-fourth wider between eyes than median length.

Color: Dull yellowish, ocelli black, a round spot next each ocellus and a pair back of apex, same size and shape, black. Elytra brownish, veins paler.

Genitalia: Female last ventral segment with lateral margins short, then produced to form a conspicuous rounded lobe either side of a broad sunken, truncated or slightly produced portion which is embrowned and occupies the median third of segment. Male plates short and broad, two-thirds as long as combined width at base, apices broad, bluntly rounded. Oedagus in ventral view broad, slightly constricted just before apical fourth which bears a broad, deep V-shaped notch forming a pair of pointed, divergent processes. In lateral view the oedagus is fairly broad on basal two-thirds, the apical third resembles *mohri* and *oquaka* and is broadened and broadly curved at apex.

Originally described from specimens collected at Miami, La Belle and Sanibel Id., Florida. One specimen is at hand collected at Brownsville, Texas, by Prof. Herbert Osborn.

Graminella bisignata (Sanders & DeLong)

Thamnotettix bisignatus S. & DeL. Proc. Ent. Soc. Wash. 25:154, 1923.

Resembling *plana* in form and general appearance but with a broken black band across apex of vertex. Length 4 mm.

Vertex bluntly angled, a little broader between eyes than length at middle.

Color: Dull brown to yellow, vertex with two black transverse bars forming a broken band just above margin, the inner ends bent and extending anteriorly over apex on to front. Elytra pale to smoky, subhyaline. Face dark.

Genitalia: Female last ventral segment with posterior margin almost trun-

cate, slightly produced at middle. Male plates very long and narrow. Produced to form long, gradually narrowed pointed tips. Oedagus rather broad at base gradually tapered to bluntly pointed apex. In lateral view rather broad and uniform in width, slightly indented on ventral side near apex, with apical portion convexly curved on ventral side to form a pointed angle with the straight dorsal side.

Originally described from a single male from Cleveland, Florida. Dr. L. A. Stearns has recently found it occurring in abundance at lighthouses in Delaware Bay. It inhabits the salt marsh. Allotype female: Ship John Light House, Delaware Bay, Aug. 22, 1936.

Graminella virginiana (Sanders & DeLong)

Thamnotettix virginianus S. and DeL. Proc. Ent. Soc. Wash. 24:99, 1922.

A blunt headed yellowish species with a row of four black spots on margin of vertex, the pair at middle are very small. Length 3.5-4 mm.

Vertex bluntly angled, almost rounded, a little wider between eyes at base than median length.

Color: Dull yellow, a large black spot just posterior to each ocellus, and a pair of very minute spots at apex, brown. Elytra pale brownish, veins white.

Genitalia: Female last ventral segment with posterior margin notched either side of a central, rather narrow, blunt embrowned tooth, produced at least one-third the length of the segment. Male plates rather short and broad, gradually narrowed from base to closely appressed blunt tips. Male style with a long tapered apical process. Oedagus in ventral view cleft at middle so as to form a pair of parallel processes which are widely separated, long, straight, and obliquely sloping at apex. In lateral view it is wide at base, the ventral side is extended into a long attenuated upwardly curved process, the dorsal portion tapers toward the ventral.

Originally described from specimens from Cape Charles, Virginia. Types were used during this study.

Graminella fitchii (Van Duzee)

Thamnotettix fitchii V. D. Ent. Am. 6:133, 1890.

A large yellowish greenish species with four black spots above margin of vertex. Length 4.5 mm.

Vertex bluntly angled, slightly wider between eyes than median length.

Color: Yellow to dull greenish, with four black spots above margin of vertex, a round one next each ocellus and a pair of triangular spots just back of apex. Pronotum marked with five faint longitudinal striae. Elytra pale brownish subhyaline, veins pale.

Genitalia: Female last ventral segment roundedly excavated either side of a median slightly produced, broad, sunken tooth. Black markings of posterior margin causing it to appear more deeply notched. Male plates long, gradually, concavely tapered to bluntly pointed apices. Male valve with a

pair of processes on apex. Oedagus in ventral view broad, slightly constricted at middle and enlarged on apical third then tapered to a pair of out turned pointed apical processes which are formed by a deep narrow median incision. In lateral view the oedagus is broad at base, narrowed near apex then appears enlarged by the curling of the apex.

This is the most common species of the genus and is found abundantly in fresh water marshes, swamps, rank growths of grasses and on the prairies. Specimens have been examined from a large number of states including Ohio, Pennsylvania, New York, New Jersey, Maine, New Hampshire, Virginia, Tennessee, Illinois, Wisconsin, Minnesota, Iowa and Kansas.

***Graminella nigrinota* sp. nov.**

Resembling *albovenosa* in form and general appearance but with a large black spot next each ocellus, brown markings at apex, and with distinct genitalia. Length 3.5-4 mm.

Vertex bluntly angled, as long at middle as basal width between eyes.

Color: Face yellowish with paler arcs. Ocelli black, a large black spot just anterior to each ocellus and just above margin and a pair of proximal oblique brown dashes at apex of vertex. Pronotum scutellum and elytra yellow, mottled with white, veins of elytra pale.

Genitalia: Female last ventral segment truncate with median third slightly produced, forming a broad rounded lobe. Male plates rather long, concavely narrowed to rather long, bluntly pointed apices. Male oedagus in ventral view short and rather narrow, slightly constricted at middle, enlarged at apex which bears a rather broad, short, U-shaped notch. In lateral view it is rather broad at base and tapered to a long attenuated apical portion with tip blunt. The style is short and broad with a short basal process, a broad body and a short curved apex.

Described from a series of one male and eight female specimens collected at Florence, South Carolina, Sept. 1 to 20, 1930 by O. L. Cartwright, and one male from La Belle, Florida, collected April 21, 1921 by the senior author. Male holotype (Florida, female allotype (South Carolina) and male and female paratypes in collection of the senior author.

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EXPLANATION OF PLATES

The name of each species is printed under the head (1). To the right of each head are: the female genitalia (2); male style (3); lateral view of oedagus (4); male plate (5); and ventral view of oedagus (6).





