

SOME NEW PORTO RICAN SCALE PARASITES (HYMENOPTERA: ENCYRTIDAE)*

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The writer, while conducting some scale and white-fly parasite studies in Porto Rico, during 1925, reared a large number of very interesting forms, many of which proved to be new to science. Two of the species described in this paper are primary parasites of the Pustule Scale, which is a very destructive pest in the West Indies. This scale occurs in Florida, where it disfigures the oleander. It would be very interesting to determine whether or not these two parasites also occur there. Thanks are due Mr. P. H. Timberlake, who kindly confirmed the validity of these species and has helped the writer in many ways in his study of these minute parasites. The new genus is named in honor of Dr. Ricardo G. Mercet, who has recently revised and done so much in this group and who has also confirmed the validity of the genus and species.

MERCETIELLA (New Genus)

Female.—Closest perhaps to *Metaphycus*, but with the mesonotum and scutellum very strongly reticulated, and having no trace of parapsidal furrows. Scutellum no wider than long and decidedly more acute at apex than in *Aphycus* and with the setæ long and bristle-like. Body rather robust and non-metallic, the abdomen rather short, rounded at the apex and with the ovipositor reaching internally nearly to the base; the tactile plates very much retracted and situated rather closer to the base than to the middle, thereby differing from true *Aphycus*, which generally have the plates placed beyond the middle, at least in the female. Antennæ of female are typical of Mercet's *Euaphycus* group, the funicle composed of six joints and the club three-segmented, but having the scape and pedicel microscopically reticulated. Man-

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dibles tridentate, the three teeth being about equal in length and distinctly more acute than in the *Euaphycus* group. Maxillary palpi three-segmented, the labial palpi two-segmented. Wings *Aphycus*-like in arrangement and density of pubescence and in the shape of the submarginal vein; the marginal vein is distinctly longer than wide and the stigmal vein is comparatively short, wide at the apex and much constricted at its base.

Male.—Differing from the female in having antennæ with numerous long hairs which are longer and more prominent than in the species of true *Aphycus*. The hairs are about as long and prominent as in *Metaphycus melanostomatus*, but the first funicle joint is not lengthened as in that species. The reticulated scape and pedicel readily associate the male with the female even were biological data lacking.

Genotype.—*Mercetiella reticulata* Dozier.

MERCETIELLA RECTICULATA (New Species)

(Text Figs. 1, 2, 3)

Female.—Rather robust. Frontoververtex over twice as long as wide, the ocelli placed in an acutely angled triangle. Eyes sparse and very finely hairy. Antennal scape cylindrical, narrow, and only slightly widened in center; pedicel almost as long as the first three funicle joints; first five funicle joints of nearly equal length, each gradually increasing in width until the sixth is almost twice as wide as the first; club elongate oval, slightly wider than the last funicle joint, slightly pointed at apex and as long as the last five funicle joints combined. Wings uniformly ciliated, the oblique hairless streak interrupted below, the cut-off portion separated from the basal hairless streak by two indistinct and faint rows of cilia. Pronotum, metanotum, and propodeum distinctly reticulated and with sparse whitish hairs.

Coloration.—Head including the eyes black, vertex yellowish with its base darker. Thorax black which becomes brownish in balsam-mounted specimens and in these a narrow, pale, median, longitudinal stripe becomes visible. Abdomen testaceous yellow, with a median irregular fuscous patch on dorsum near base; slight infuscation along the posterior margins; in balsam-mounted specimens this dorsal fuscous patch breaks up into a more irregular, less noticeable patch, distinctly reddish in color. Antennæ yellowish, scape without markings, pedicel and club brown, the first five funicle joints very slightly darker than the sixth. Legs whitish except the tarsi, which are testaceous yellow, the fore-legs without markings; the middle femora with an interrupted, distally located, indistinct blackish band, the tibiæ with two more or less interrupted

blackish bands; the hind tibiae with two more or less distinct blackish bands.

Length (exclusive of ovipositor) .820-.920 mm.

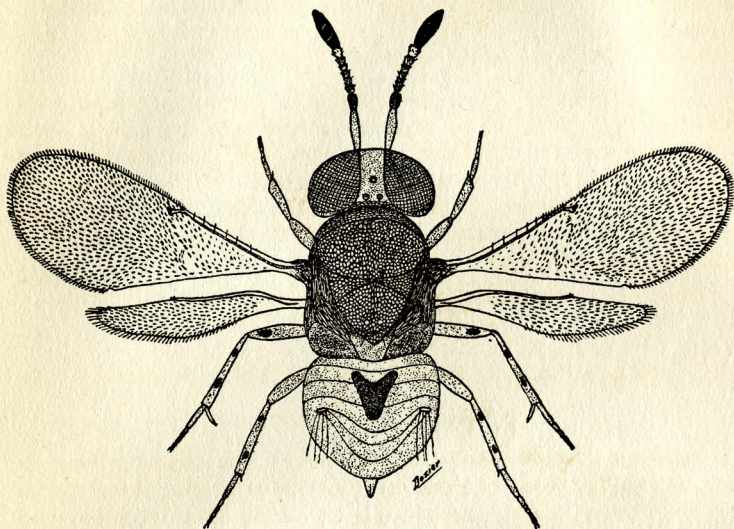


Fig. 1. *Mercetiella reticulata*, adult female, greatly enlarged.

Male.—Pubescence of the eyes sparse and very short and fine. Antennae with numerous long, conspicuous hairs; scape and pedicel reticulated; scape very slightly widened in the center where it is about as wide as the pedicel which is decidedly wider than the joints of the funicle; all joints of the funicle increase in length so that the sixth is over twice as long as the first and nearly as wide as the club; the club nearly three times as long as the sixth funicle joint.

Entire body black, becoming brown in balsam mounts. Antennae entirely dusky. Fore and middle legs dusky, lightened up at the distal and proximal ends of femora and tibiae; tibiae of hind legs with two more or less distinct blackish bands.

Length .820 mm.

Described from a series of four females and one male reared from the Pustule Scale, *Asterolecanium pustulans*, on Balsa wood tree, Nov. 23, 1924, twelve females and two males reared from same insect on *Cassia fistula* tree during May 16-21, 1925, and a large series of males

and females reared from similar material November, 1925; all reared by the writer from material collected at Rio Piedras, Porto Rico.

Holotype male, allotype and one paratype female on same slide, and two females and two males mounted on card points, deposited in the U. S. National Museum (Type Cat. No. 28982); paratypes in collections of the writer, P. H. Timberlake, R. G. Mercet, and the Porto Rican Insular Experiment Station.

Descriptions are made from slide-mounted specimens and fresh living material. This species is a primary parasite of *Asterolecanium pustulans*, and aids in checking this serious pest of the fig, *Cassia fistula*, silver oak (*Grevillea* sp.), oleander, mulberry, and many other trees and shrubs.

According to Mr. P. H. Timberlake, *Asterolecanium pustulans* is a common scale in Hawaii but has no parasites there except *Tomocera californica*. This latter parasite, so far, is not known to occur in Porto Rico and might prove a valuable introduction as it is also an enemy of the Black Scale, *Saissetia oleae*.

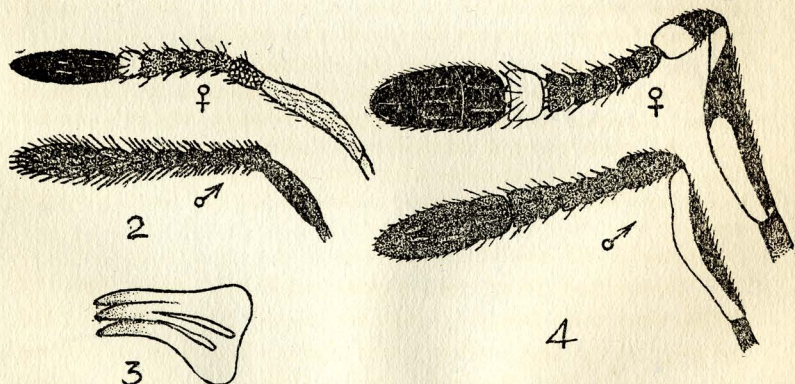


Fig. 2. (a) *Mercetiella reticulata*, female and male antennæ greatly enlarged; (b) *Mercetiella reticulata*, mandible, greatly enlarged; (c) *Euaphycus portoricensis*, female and male antennæ, greatly enlarged.

EUAPHYCUS PORTORICENSIS (New Species)

(Text Fig. 4)

Female.—Frontovertex over twice as long as wide, the ocelli placed in an equilateral triangle. Antennal scape long, narrow, flattened but not greatly widened; pedicel about as long as the first three funicle joints combined, the first three funicle joints are of about the same length and width, the others distinctly increasing in width; club distinctly wider than the funicle, elongate oval, obtusely rounded at apex. Maxillary palpi three-segmented, the mandibles tridentate. Wings uniformly ciliated, the oblique hairless streak of the forewing interrupted by several rows of cilia. Ovipositor protruded.

Coloration.—Head and body yellow with the mesonotum and scutellum distinctly orange. Eyes with greenish bloom in life. Antennal scape pale with the outer half fuscous; basal half of pedicel blackish, the apical half whitish; first five funicle joints and club brown, the sixth funicle joint whitish. Abdomen yellow with an irregular patch of brown on dorsum. Legs whitish, middle femora with indistinct black band, the tibiæ with two black annulations; two more or less distinct bands on hind tibiæ and the juncture of the femora with the tibiæ, blackish; tarsi yellowish.

Length (exclusive of ovipositor) .960 mm.

Male.—Vertex, pronotum, mesonotum, and scutellum distinctly reticulated, quite similar to *Mercetiella reticulata*, the mesonotal hairs showing rather prominently on account of their dark color, abundant and bristle-like. Under high power of the microscope the hind margins of the abdominal segments are faintly reticulated. Antennæ similar in shape to those of the female but the club is distinctly longer and more narrow in proportion.

General color brown with the dorsum of thorax black, the entire insect, however, lightens up when mounted in balsam on slides. Antennæ entirely dusky except the scape, which is whitish with the outer margin striped with fuscous part of its length. The middle and hind tibiæ with two more or less distinct black bands, and both distinctly black at the junction of the femora and tibiæ.

Length .760 mm.

Described from two female and one male May 14, 1925, and two females and one male Nov. 14-16, 1925, all reared by the writer from *Asterolecanium pustulans* collected at Rio Piedras, Porto Rico, on *Cassia fistula* and mounted in balsam on slides. This parasite is also a primary one but much less abundant than is *Mercetiella reticulata*.

Holotype female and allotype male on slides deposited in U. S. National Museum (Cat. No. 29070); paratype female in collection of P. H. Timberlake; others in the collection of the writer.

ACEROPHAGUS NUBILIPENNIS (New Species)

In Timberlake's table to members of this genus this species runs to *A. fasciipennis* Timb. but is quite distinct from that species.

Female.—Frontovertex about one-half longer than wide, the ocelli placed in a triangle. Eyes not pubescent. The shorter and more basal tooth of the mandible is on the inner margin instead of the outer as in *A. fasciipennis*. Antennal scape very long and narrow, very slightly widened at middle, a little longer than the funicle joints combined; the pedicel about as long as the first four funicle joints combined, decidedly wider than the latter but narrowed towards its base; the funicle joints successively increasing in width and slightly in length; the club is apparently solid. Mesonotum abundantly furnished with very fine light colored setæ, a row of these near the hind margin much stronger and darker. Forewings uniformly ciliated except towards the base, the oblique hairless streak distinct.

General color a very pale yellow with the dorsum of a more pale orange tint, the abdomen pale with the hind margins of the two segments above the vibrissal plates brownish. Antennæ dusky yellowish. Wings hyaline with the veins yellowish, the forewings with a very conspicuous smoky band extending in a somewhat triangular manner across the disk (in *A. fasciipennis* the band extends across disk in its full width); the tip of marginal vein and the stigma infuscated, forming a rather distinctive marking, and crossing the smoky band is a lighter transverse streak nearer the hind margin. Ovipositor not very much darker than the abdomen. Legs concolorous with the underpart of the body.

Length .76-.80 mm.

Described from two females, mounted on slides in balsam, one reared by the writer from *Pseudococcus aonidum* on Elephant Ear at Rio Piedras, Porto Rico, May 25, 1925, and the other from *Pseudococcus citri*, Rio Piedras, Porto Rico, May 26, 1925.

Holotype deposited in the U. S. National Museum (Cat. No. 29071) and the paratype retained in the private collection of the writer.

NOTES ON NEW AND INTERESTING DELPHACIDS*

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The following notes and descriptions have been kept in manuscript for several years and they are now published with the view that they will be of interest and help to some of the present workers in the group.

Achorotile foveata Spooner. In examining a series of eight brachypterous females taken by Prof. H. Osborn in Yellowstone Park, Wyom., I find that they agree in every particular with the description. The number of pustules on each side of the abdominal segments is not constant, however, and I believe this species to be identical with the European *albosignata* of Dahlbaum.

Laccocera zonata Van D. A series of eighteen brachypterous females taken by Prof. Osborn at Kallspell, Mont., are typical.

Laccocera obesa Van D. Twenty-six brachypterous females taken at Kallspell, Mont., by Prof. Osborn. One macropterous female taken by C. N. Aineslie at Springer, N. Mex.

Lepticus oculatus Crawf. A series of fourteen nymphs of several instars were taken sweeping young bulrushes and sedges in swampy field near Sandusky, Ohio, Oct. 6, 1921, by the writer. These agree perfectly with the description by Crawford, which was based on a single immature male from Managua, Nicaragua, but have the vertex a little more constricted near apex than is shown by his figure. Three specimens in last instar were taken by Prof. Osborn at Delphos, Kansas, together

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with members of *Pentagramma vittatifrons*. These last instar nymphs taken together with a number of *Pentagramma vittatifrons* agree perfectly with the description and confirm my suspicion that *Lepticus oculatus* of Crawford is an immature *Pentagramma*.

Bakerella maculata Crawf.

1914 Proc. U. S. Natl. Mus., xlii, p. 601, 1 Fig.

Male genitalia quite distinctive. A small species hard to place unless the male is available.

Head as broad as thorax; vertex nearly square, strongly carinated; frons only a little longer than broad, sides strongly rounded, median carina forked slightly above the ocelli, strongly divergent, lateral carinae terminating well within laterals of clypeus; antennae stout, very short, first segment less than one-third as long as the second. Pronotum moderately long, not quite as long as vertex, tricarinate, the lateral carinae curved out, not reaching the hind margin. Scutellum almost twice as long as pronotum, tricarinate. Elytra typical, long; in brachypterous form, short and well rounded apically. Legs very short, hind tibiae scarcely longer than femora; calcar only slightly longer than breadth at base, margin not dentate.

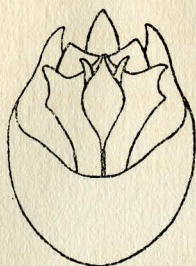
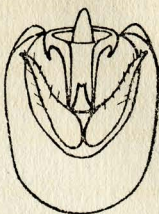
General color yellowish-brown to dark brown, usually the latter, carinae slightly paler. Frons with a number of whitish spots. Abdomen usually dark fuscous or yellowish marked with fuscous. Legs fuscous, tibiae banded with pale.

Male pygofer and apertures resembling *Liburniella ornata*, latter elliptical, broadest sub-basally; anal tube projecting rather prominently, small with two elongate, very slender processes on ventral margin; genital styles fairly short, pincer-like, scarcely divergent, roundedly acute at apex; anal style distinctly whitish.

Female ovipositor and sheath very dark fuscous, the anal tube prominently white.

Length of body 2.4 mm.

Crawford described this genus and species from a macropterous pair from Acapulco, Mexico, and gave a good figure of the male genitalia. I am describing the brachypterous form from a series of two females and two males, collected by the writer Aug. 6, 1921, sweeping grass and sedges near edge of a bayou at Pascagoula, Miss., and a pair taken sweeping in a marsh near Sandusky, Ohio, Oct. 6, 1921.

*E. vanduzeei**D. acuministyla*

Male genitalia of *Euidella vanduzeei* and *Delphacodes acuministyla*.

Euidella vanduzeei Muir and Giffard.

1924 Bul. 15, Ent. Ser., Haw. Sugar Exp. Sta.

Closest allied by genitalia to *Euidella magnistylus* Crawford and *weedi* but quite distinct.

Macropterous form:—Head narrower than pronotum. Vertex nearly square, carinae distinct; frons rather long, tricarinate, narrow at apex widening below the eyes. First segment of antennae a little shorter than the second, the latter somewhat tuberculate. Pronotum about as long as the vertex, tricarinate, lateral carinae strongly curved outwards and not attaining the hind margin. Scutellum nearly twice length of pronotum, tricarinate. Elytra long, nearly hyaline, veins becoming fuscous apically beyond the cross-veins.

General color pale to soiled testaceous-yellow, except the partially infuscated antennae, abdomen and genitalia, and the fuscous eyes.

Female ovipositor sheath cylindrical, pale, ovipositor itself darker.

Male pygofer moderately large, fuscous, ventral margin of aperture sinuately rounded; genital styles dark fuscous and very prominent, long and rather thick, hirsute, divergent, converging beyond the middle, thence to bifurcate inner tip, the exterior margin with more or less sharp projections beyond the middle; the entire styles resembling the antlers of a moose; ventral margin of anal tube with a median triangular notch, a tooth on each side; anal style medium-sized.

Brachypterous form:—similar to the macropterous form but having the elytra very short, cut off truncate with edges well-rounded, veins unicolorous.

Length of body 2.50-3 mm.; length to tip of macropterous elytra 3.50 mm.

Descriptions made from two macropterous males and two females and a brachypterous series of seventeen females and nine males collected by the writer at Pascagoula, Miss., Aug. 8, 1921, and a brachypterous female from Biloxi, Miss., July 30, 1921, sweeping grass and sedges in wet area. A male collected by Prof. J. S. Hine at Cameron, La., Aug. 14, 1903, is identical.

The writer carried this species in manuscript for several years, awaiting the opportunity to settle the identity of *weedi* to which it is very close. The species has since been described by Muir and Giffard under the name *Euidella vanduzeei* from Florida.

Delphacodes (Liburnia) *acuministyla*, n. sp.

A very small species, closest allied in structure of male genitalia with *consimilis* and *pellucida*.

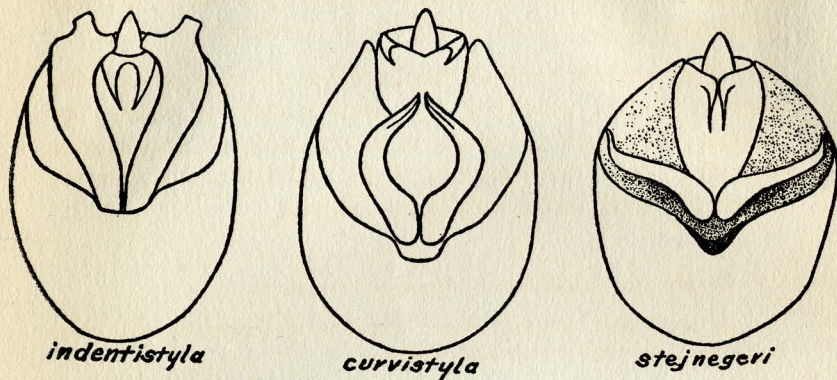
Brachypterous form. Head slightly narrower than prothorax. Vertex subrectangular, a little longer than wide, rather weakly carinated and slightly produced beyond the eyes. Frons elongate, narrowed between the eyes, enlarging below the eyes, tricarinate, the median carina forked a little below the apex of head. Antennæ long, the second segment twice as long as the first. Pronotum comparatively long and broad, about length of the vertex, tricarinate, the lateral carinæ curved out behind the eyes and not reaching the hind margin. Elytra short, well-rounded on outer side; apex truncate and rounded. Legs long and slender; calcar typical, margin very finely dentate.

General color pale testaceous; eyes dark; dorsum of abdomen orange yellow, with a dark area at base and the last three or four segments whitish; just before this there is a black transverse band, variable in width and distinctness. These show through the translucent elytra, giving the latter the appearance of being banded. Elytra translucent, yellowish-testaceous with the tips piceous. Male pygofer dark piceous. Legs pale, immaculate.

Male pygofer small and rather short, ventral margin rather deeply and roundly emarginate, produced dorsally caudad on each side of anal tube; genital styles long and acuminate, rather stout at base, widely divergent, flexed out, sparsely hirsute, and acute at tip; anal tube with two very long, slender, needle-like ventral processes; anal style small, white.

Length of body 1.5-80 mm.

Described from a series of four males swept at edge of salt marsh bayou, Feb. 18, and ten males sweeping grass in pine woods, Feb. 21, 1922, all brachypterous, Ocean Springs, Miss., by Prof. H. Osborn.



Male genitalia of *Delphacodes indentistyla*, *curvistyla* and *stejnegeri*.

Delphacodes curvistyla, n. sp.

Macropterous form. Head narrower than pronotum, the carinae of vertex very distinct. Frons long, tricarinate, narrower at apex of vertex but widening below the eyes. Last antennal joint slightly shorter than the basal one, tuberculate. Pronotum about as long as the vertex, tricarinate, the lateral carinae strongly curved outwards and not attaining the hind margin. Scutellum over twice as long as the pronotum, tricarinate. Elytra long, hyaline, the veins distinctly fuscous.

General color soiled testaceous or dirty yellowish-brown.

Male pygofer fuscous, ventral margin of aperture sinuately rounded; genital styles dark fuscous, very prominent, rather thick, divergent and distinctly and characteristically recurved; anal style medium sized.

Length to tip of wings 3.10 mm.

Described from a macropterous male collected by the writer at Ocean Springs, Miss., Aug. 3, 1921, sweeping swampy area, and a macropterous male taken by Prof. Hines at Cameron, La., July 11, 1905.

Delphacodes indentistyla, n. sp.

A medium sized species difficult to distinguish from a number of species such as the above described *curvistyla*, *weedi*, etc., except by the male genitalia.

Head narrower than the pronotum, the vertex longer than wide and not prominently carinated. Frons long, widened below the eyes, narrowing towards apex. Last joint of antenna shorter and more robust than the basal one, somewhat tuberculate. Pronotum about as long as the vertex, tricarinate, lateral carinae not quite reaching the hind margin. Scutellum twice as long as the pronotum, tricarinate. Macropterous wings long, venation darker.

Male pygofer with the ventral aperture sinuately rounded; genital styles prominent, long and broad with indentions at apices as in figure.

Length to tip of macropterous wing 3.00 mm.

Described from one female and three males taken by the writer sweeping low grass along road through deep, dark swamp near Merrill, Miss., August 9, 1921.

Delphacodes stejnegeri (Ashm.)

1898 Fur Seals and Fur Seal Isles of the No. Pacific Ocean, Pt. IV.

Very closely allied in structure of male genitalia to *pellucida* Fabr. but is stouter and pale yellow in color.

Head broad but narrower than the prothorax. Vertex nearly square, produced a little beyond the eyes, carinate, distinctly foveate. Frons twice as long as wide, broad at base narrowed at anterior margin of the eyes and then gradually broadened to posterior margin of the same, then slightly narrowed to clypeus; tricarinate, the median carina forked just below apex of the head. Antennae comparatively short, the second segment tuberculate, twice as long as the first segment; seta long and fuscous. Pronotum nearly as long as the vertex, posterior margin rather deeply and angularly emarginate, tricarinate, lateral carinae curved out behind the eyes and not reaching the hind margin. Mesonotum about twice as long as the pronotum, tricarinate. Brachypterous elytra very short, truncate with apices well rounded, with delicate punctures along the nervures. Abdomen large and stout. Calcar typical, tectiform.

In the macropterous form the elytra are also very short, reaching to or just extending beyond the tip of abdomen.

General color of female pale yellowish testaceous, abdominal segments margined with fuscous and ovipositor fuscous. In the

male the scutellum, frons and clypeus, except the pale carinæ, are fuscous and almost the entire underside including the genital segment, is black. Legs pale, faintly lineated with brown.

Female segment subcylindrical, roundly emarginate at base, ovipositor not reaching to tip of ovipositor sheath.

Male genital segment terminal; ventral margin of pygofer deeply notched; genital styles long, stout at base and narrowed to an acuminate tip; flexed outward, lying closely against the ventral margin of pygofer; anal tube with two needle-like ventral processes.

Length of body 2.50-3 mm.

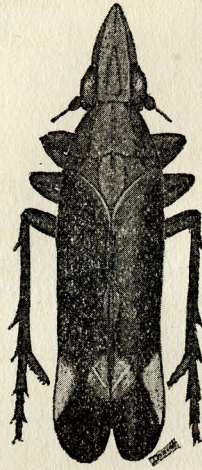
Redescribed from four brachypterous females, *Anchorago*, June 6, 1917. Six females and eight males taken in June 20-Aug. 10 at Katmai and a rather large female from Kashirk Bay, Aug. 2. All were taken by Prof. J. S. Hine in Alaska during the summer of 1917.

Megamelanus terminalis Metcalf. This species is found in the *Spartina patens* association. The writer swept a single specimen at edge of inland bayou near Mobile, Alabama, in August 1923, and has examined a single male taken by Prof. Herbert Osborn sweeping in salt marsh at Ocean Springs, Miss. It was originally described from material collected at Cape Charles, Va., and Caroline Beach, No. Car., and the distribution of this and the two following species probably follows the distribution of their food plant, *Spartina patens*, around the entire Atlantic and Gulf Coasts.

Megamelanus lautus Metcalf. The writer collected a male of this species at Ocean Spring, Miss., Aug. 3, 1921, sweeping *Spartina patens*, and Prof. Osborn took a male at the same locality Feb. 11, 1922. Originally described from material collected on the Texas Coast.

Megamelanus dorsalis Metcalf. Two males were collected by the writer at Ocean Springs, Miss., Aug. 6, 1921, a male from same marsh habitat at Pascagoula, Miss., August 6, 1921, and Prof. Osborn took a male at the former locality, Feb. 11, 1922. A male specimen of

this species, collected by Prof. J. S. Hine at Cameron, La., June 30, 1905, in the Ohio State University collection has also been examined.



Adult *Megamelanus lautus* Metcalf, greatly enlarged.

The three above mentioned species all seem to be extremely rare as so few were taken, although extensive and hard sweeping was done.