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A REVISION OF THE GENUS MEGAMELANUS AND ITS ALLIES (HOMOPTERA, FULGORIDAE, DELPHACINAE)¹

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INTRODUCTION

The present paper consists of a revision of a rather heterogeneous group of species of delphacine fulgorids usually placed in the genus *Megamelanus* Ball. In 1902 Ball erected the genus *Megamelanus* with *bicolor* as the genotype. The following species have been added since: *elongatus* Ball (1905), *rufivittatus* Ball (1905), *spartini* Osborn (1905), *frontalis* Crawford (1914), *dorsalis* Metcalf (1923), *terminalis* Metcalf (1923), *laetus* Metcalf (1923), all North American species, and *graminicola* Muir (1928) from Bermuda. This study was confined to those species occurring in the United States.

The types of *M. spartini* Osborn have been lost and, therefore, are not illustrated in the present work. However, on the basis of the original description it is provisionally placed in the genus *Neomegamelanus* n. gen.

KEY TO GENERA

1. Head acutely pointed in dorsal view; pronotum flared at lower margin *Neomegamelanus*
Head not acutely pointed in dorsal view; pronotum normal 2
2. Head swollen in appearance; lateral carinae of head not strongly elevated *Tumidagena*
Head not acutely pointed or swollen in appearance. Pentagonal or truncate in dorsal view 3
3. Clypeus¹ about one and one-half times as long as wide near apex,

¹The front of the head, sometimes termed the front or frons

- widest at middle; pygofer of males deeply notched at about level of genital styles; brachypterous forms with elytra extending to about third abdominal segment *Megamelanus*
Clypeus about two times as long as wide near apex, widest near apex; pygofer of males regular, not conspicuous by indentation of hind margin; elytra of brachypterous forms extending almost to or beyond end of abdomen. *Prokelisoidea*

Megamelanus Ball

Megamelanus Ball, 1902, Can. Ent., 34:265.

"Resembling *Megamelus*, but with the front of equal width above and below and the vertex sharply angled in front. Resembling *Delphacinus*, but

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with the side keels of the pronotum attaining the hind margin. Vertex 5-angular, but with the lateral foveae depressed and their inner carinae strong and meeting at the sharp apex, giving it the appearance of being acutely triangular; front broad, nearly rectangular, median carina distinct, not forked, a trifle the widest in the middle, the lateral margins gently evenly curving, the apical margin carinate just above the deep clypeal suture; clypeus small, rounding, without carinae; pronotum shorter than vertex, strongly tricarinate, the lateral pair just inside and parallel with those on vertex, extending to the posterior margin; elytra commonly brachypterous, covering the second abdominal segment. In the macropterous form long and broadly rounding posteriorly; venation nearly as in *Megamelanus*.

"Type of genus *Megamelanus bicolor*."

Type in Ball collection in U.S.N.M.

Megamelanus bicolor Ball

Pl. 1

Megamelanus bicolor Ball, 1902, Can. Ent., 34:265-266.

Superficially resembling *Tumidagena terminalis* (Metcalfe) but head in dorsal view pentagonal in shape. Elytra of brachypterous form extending to about third abdominal segment. Length ♂ 1.5-1.8; ♀ 2.5.

Genitalia: In lateral view pygofer with deep notch in hind margin about level of styles; aedeagus a simple blade-like shaft, turned sharply downward between styles, sides closely compressed, caudal margins serrate, widest at base; gradually tapering to a point, a spine-like projection on ventral margin at base. Genital styles short, stout spines on outer margin extending for about half length of style; genital segment with lower margin curving sharply upward at the middle and then posteriorly to the hind margin giving it the shape of a rectangle with the lower hind corner removed, upper hind corner terminating in a pair of short processes; a small protuberance extends from lower margin of pygofer below styles, apex of protuberance spiculate.

Lectotype here designated, Ft. Collins, Colorado, July 28, 1898, (no collector label on pin). In U.S.N.M.

Additional material studied: Kansas: Meade, Reno, Seward, Wichita Counties; Arizona: St. Johns, Chino Valley; California: Little Lake, Palm City, Del Mar, Olancho, Campo, Potrero; Colorado: Ft. Collins; Idaho: Nampa, Burley; Nevada: Winnemucca, Elko, Fernley; New Mexico: Mesilla, Belen, Wagonmound, Socorro Co.; Utah: Vernal. All collected by R. H. Beamer. New Mexico: Belen, L. D. Beamer, California: Pine Valley, E. L. Todd.

Tumidagena n. gen.

Small insects from 2 to 4 mm. long, formerly included in the genus *Megamelanus* Ball. Lateral carinae of genae originating at base of lateral carinae of head above eye, extending forward laterad and ventrad, gradually returning mesad and upward to apex of head, imparting to head a distinctly swollen appearance. Vertex flat; lateral carinae not strongly elevated, meeting at apex of head; median carina clearly "Y" shaped, projecting forward to about front margin of eye; arms of stem diverging obliquely forward to lateral

carinae of head. Front margin of pronotum extended into hind margin of head to about middle of eye; pronotum equal to width of head, caudal margin slightly sinuate, concave, forming a shallow inverted "V" in outline; tricarinate, lateral carinae straight basally, diverging and fading out apically just before hind margin of pronotum, median carina extending length of pronotum. Calcar about two-thirds as long as first tarsal segment including apical spines, strongly and uniformly toothed. Anal segment with a pair of processes. First antennal segment as long as wide, second segment three times as long as first.

Type species: Tumidagena minuta n. sp.

Key to the Species of the Genus *Tumidagena*

1. Head length less than twice width at base *T. minuta*
Head length at least twice width at base 2
2. Head almost three times as long as width at base; aedeagus with a large fang-like spine at base on right side *T. terminalis*
Head slightly more than twice as long as width at base; aedeagus without a large fang-like spine at base on right side *T. propinqua*

Tumidagena terminalis (Metcalfe)

Pl. 2

Megamelanus terminalis Metcalfe, 1923, Jour. Elisha Mitch. Sci. Soc., 38:198-199.

T. terminalis resembling *T. propinqua* n. sp. but with a large spine on the right side at base of aedeagus. Resembling *T. minuta* n. sp. but with vertex almost three times as long as width at base. Length ♂ 2.5-3 mm.; ♀ 3-3.75 mm.

Genitalia: Similar to *T. minuta* but slightly larger. In lateral view pygofer of male irregular in shape, margins regular (see plate 2); in caudal view genital styles long, about five times as long as width at base, apices acuminate on inner margin, curved in on outer fourth; anal segment with a pair of stout, tusk-like processes about as long as dorsal margin of anal segment, slightly curved; in ventral view aedeagus resembling a boot, wider at base and tapering to a more or less pediform apex, sides sinuous with serrate margins, a large fang-like spine at base of right side.

Additional material studied: 24 ♂♂ and 31 ♀♀, Cedar Keys, Florida, March 8, 1947; 13 ♂♂ and 6 ♀♀, Yankee Town Florida, March 9, 1947; 1 ♀, Brownsville, Texas, December 27, 1945; 14 ♂♂ 10 ♀♀, Palatka, Fla., December 24, 1950. All collected by R. H. Beamer. 4 ♂♂, Palatka, Fla., December 25, 1950, L. D. Beamer.

Macropterous form: Like the brachypterous form with fully developed flight wings: wings about four times as long as broad at widest point, extending beyond end of abdomen for about one-fifth their length, slightly widening toward apex, widest about one-fifth from apex, broadly rounded, hyaline; veins whitish with a series of slender black hairs evenly spaced along them; length of female 3.5 mm.

Types: Holomorphotype ♀, Cedar Keys, Florida, March 8, 1947, L. D. Beamer; paramorphotype ♀, Cedar Keys, Florida, March 8, 1947, R. H. Beamer. Types in Snow Entomological Collections.

Tumidagena minuta n. sp.

Pl. 2

Brachypterous form: Resembling *T. terminalis* (Metcalf) but with crown less than twice as long as width at base. Length of ♂ 2 mm.; ♀ 3 mm.

Structure: Head projecting about half its length in front of eyes; elytra reaching to about third abdominal segment, about twice as long as wide, apices broadly rounded, venation simple, veins setiferous with short black hairs easily rubbed off resulting in most specimens having veins bare; flight wings aborted; clypeus rectangular, margins subparallel slightly tapering toward base, slightly more than twice as long as wide at middle.

Color: General body color uniformly pale ivory with a waxy luster, especially evident on dorsal surface or abdomen; pygofer fulvous with caudal margin darker; the front and middle parts of legs smoky, hind legs whitish with spines on tibia, calcar, tarsi and tarsal claws conspicuous by their blackness; basal two-thirds of wings semihyaline allowing pruinose surface of mesonotum to show through; apical third of wing opaque with surface glossy.

Genitalia: In lateral view pygofer of male irregular in shape (see plate 2); in caudal view genital styles, about five times as long as wide at base, curving in on outer fourth, apices acuminate on inner margin; anal segment with a pair of stout, tusk-like processes, about equal to dorsal margin of anal segment in length, curved. In ventral view aedeagus resembling a boot, wider at base and tapering to more or less pediform apex, sides sinuate with serrate margins, a large fang-like spine at base on right side.

Females similar to males but with color of body uniformly ochraceous with a waxy luster; spines on tibia, calcar, tarsi tipped with black; tarsal claws black.

Types: Holotype ♂, Allotype ♀, 38 ♂ and 70 ♀ paratypes, Mystic, Connecticut, August 8, 1946, R. H. Beamer; other paratypes: 10 ♂ and 22 ♀, Montauk, Long Island, New York, August 17, 1946, R. H. Beamer; 4 ♂ and 4 ♀, Piney Point, Maryland, August 26, 1946, R. H. Beamer. Types in Snow Entomological Collections.

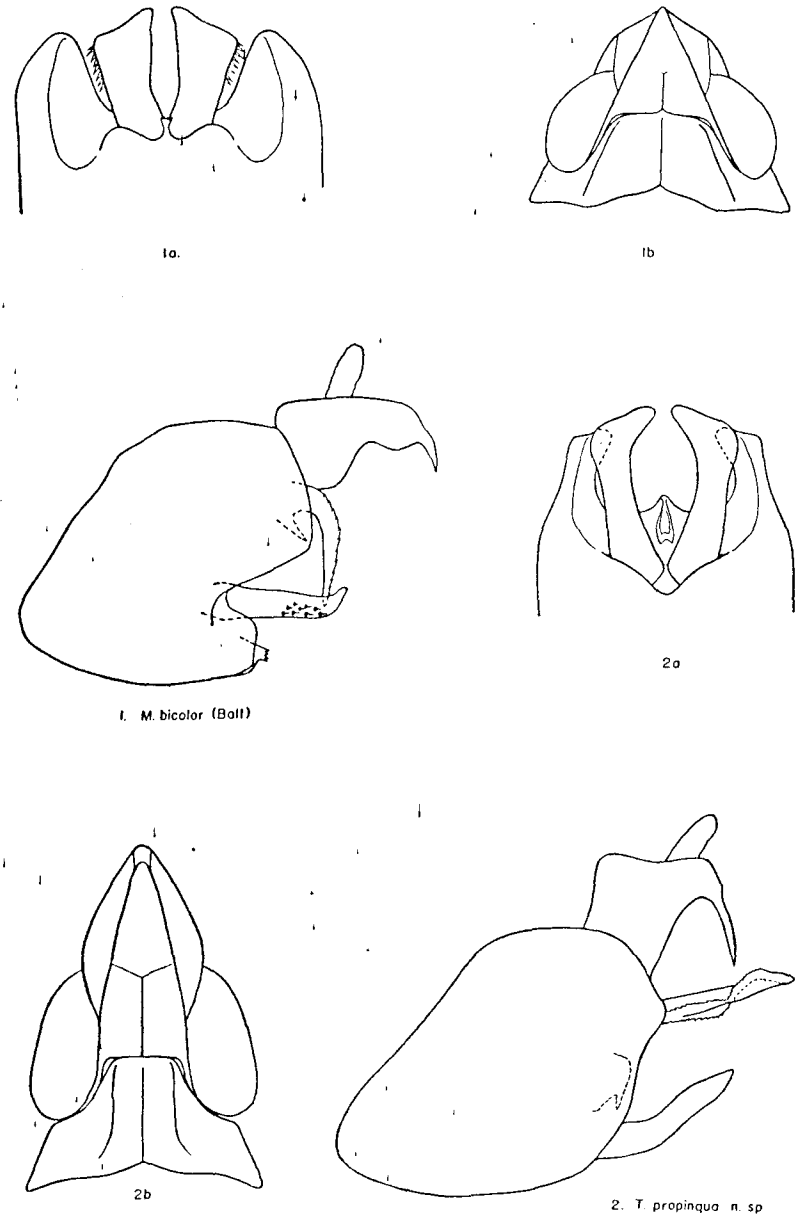
Tumidagena propinqua n. sp.

Pl. 1

Brachypterous form: Resembling *T. terminalis* (Metcalf) but lacking large fang-like spine at base of aedeagus and with a shorter crown which is from two to two and one-half times as long as width at base. ♂ 2.5 mm.; ♀ 3.25 mm.

Structure: Head projecting about half its length in front of eyes; elytra reaching to about third abdominal segment, about twice as long as wide, apices broadly rounded, venation simple, veins setiferous, but setae easily rubbed off resulting in most specimens having veins bare; flight wings aborted; clypeus rectangular, margins subparallel slightly tapering toward base, more than three times as long as wide at middle.

Color: General body color stramineous with a waxy luster becoming yellowish-orange in summer forms and ochraceous to fulvous in spring forms; legs orange-yellow with spines on tibia, calcar, tarsi and tarsal claws black; base of wings semihyaline allowing pruinose surface of mesonotum to



EXPLANATION OF PLATE I

- Fig. 1 *Megamelanus bicolor*, lateral view of pygofer and anal segment.
 Fig. 1a *Megamelanus bicolor*, ventral view of pygofer showing genital plates.
 Fig. 1b *Megamelanus bicolor*, dorsal view of head and pronotum.
 Fig. 2 *Tumidagena propinqua*, n. sp., lateral view of pygofer and anal segment.
 Fig. 2a *Tumidagena propinqua*, ventral view of pygofer showing genital plates.
 Fig. 2b *Tumidagena propinqua*, dorsal view of head and pronotum.

show through; apical half piceous, opaque, entire surface of wing with a high gloss.

Genitalia: In lateral view pygofer of male irregular in shape, margins regular, caudal margin projecting slightly lobe-like at about level of aedeagus; aedeagus trough-like, straight, with sides at basal half refolded laterally so that serrate margin is ventrad, apical third with left side folded over dorsal apex of aedeagus imparting a pediform shape to it when seen from below, the apical third of right side with serrate margin dorsal; in caudal view styles about five times as long as wide at base, curving in on outer fifth, acuminate on inner margin; anal segment with a pair of slender thorn-like processes about as long as dorsal margin of anal segment, slightly curved.

Females similar to males but body uniformly fulvous with a waxy luster; spines on tibia, calcar, tarsi tipped with black; tarsal claws black.

Types: Holotype ♂, allotype ♀, 39 ♂ and 29 ♀ paratypes, Slidell, La., Dec. 31, 1950, 2 ♂ and 5 ♀ ♀, Slidell, La., March 3, 1947; other paratypes: 3 ♂ ♂, and 1 ♀, Creole, La., June 17, 1948 4 ♂ ♂ and 1 ♀, Pearlinton, Miss., June 25, 1948. Collected by R. H. Beamer, 12 ♂ ♂ and 2 ♀ ♀, Slidell, La., Dec. 31, 1950, L. D. Beamer. Types in Snow Entomological Collections.

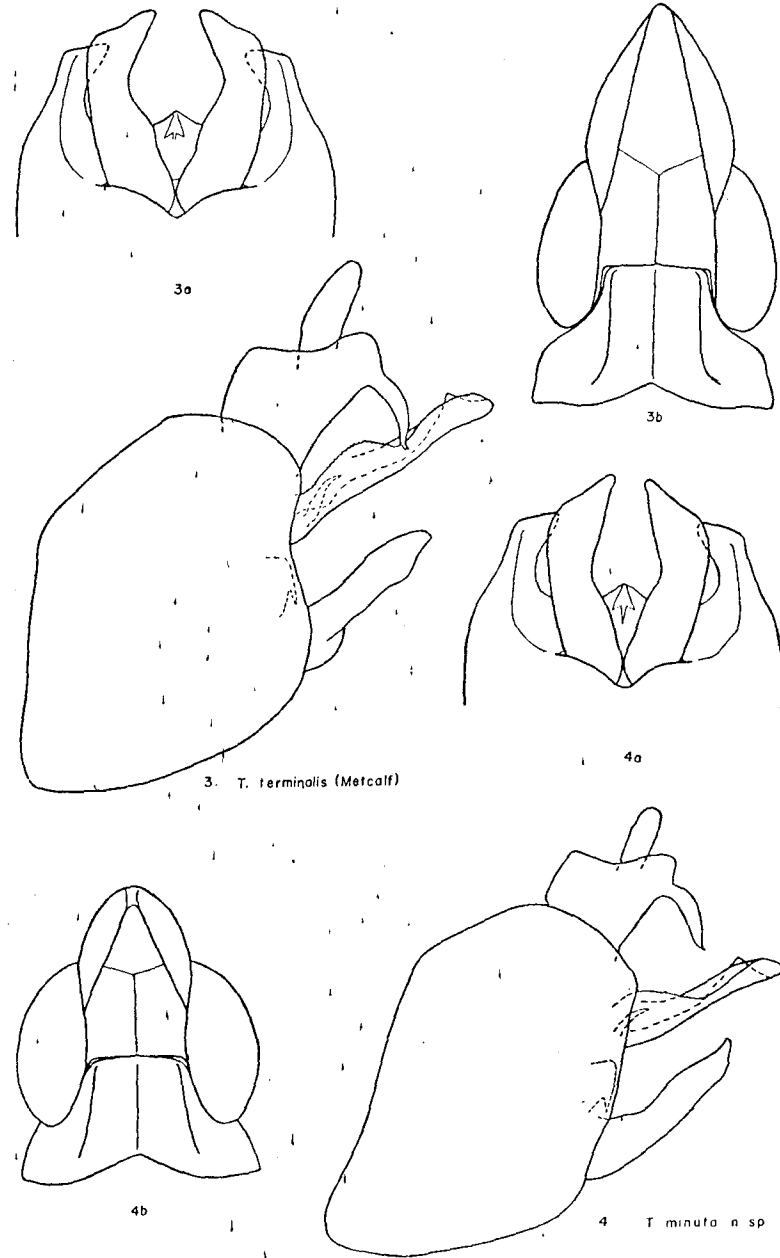
Neomegamelanus n. gen.

Elongate slender insects formerly included in the genus *Megamelanus* Ball. In dorsal view head long and acutely pointed, crown projecting in front of eye for about half its length or more; median carina usually evident basally becoming obsolete about middle of crown, lateral carinae strongly elevated, meeting at apex of head; lateral margins of clypeus visible for more than half its length, the basal part being hidden by the eye. Pronotum equal to width of head, extending into hind margin of head to a depth of two-fifths the long diameter of an eye; flared at lower margins; tricarinate, lateral carinae straight, diverging slightly to hind margin of pronotum; pronotum about half length of crown. Clypeus lanceolate, wide apically tapering to narrowed vertex, about twice as long as wide near apex, median carina single, strongly produced on upper third and becoming obsolete on basal half; calcar about three-fourths as long as first tarsal segment, strongly and uniformly toothed; first segment of antenna as wide as long; elytra of brachypterous forms long, extending almost to or beyond apex of abdomen; genital segment with one or more pairs of processes.

Type species: *Neomegamelanus lautus* (Metcalf)

Key to the Species of *Neomegamelanus*

1. Genital styles widening at apices; elytra without whitish triangles near apices2
- Genital styles acuminate at apices; elytra with opposing triangles at apices, one on the inner margin, the other on the front margin3
2. In caudal view anal segment with two pairs of processes, a short straight, spine like upper pair, and below these a much longer slender curved pair. Hind legs black and white*N. dorsalis*



- In caudal view anal segment with but a single pair of short spine-like processes, hind legs uniformly straw colored *N. elongatus*
3. Head about twice as long as wide at base; upper hind corner of anal segment produced into a lobe; a single pair of curved fang-like processes arising from about the middle of the hind margin *N. lautus*
- Head long, about three times as long as wide at base, upper hind corner of anal segment not produced into a lobe; processes arising from hind margin straight, tusk-like *N. penilautus*

Neomegamelanus dorsalis (Metcalf)

Pl. 4

Megamelanus dorsalis Metcalf, 1923, Journal Elisha Mitchell Sci. Soc., 38:199-200.

Brachypterous form: Resembling *elongatus* (Ball) but with four processes on genital tube. Elytra of male uniformly black in color. Length ♂ 2.25 mm., ♀ 3. mm.

Genitalia: In lateral view pygofer longer than broad, irregular in shape (see plate 4); aedeagus slender, elongate, with sides slightly elevated, margins coarsely serrated, apex broadly rounded; a group of four to eight teeth on left side near apex; in caudal view styles about three times as long as wide at base, margins tapering for about two-thirds their length widening apically, inner margin acuminate at apex; ventral margin of anal segment with two pairs of ventrally directed processes; outer pair claw-like opposing each other; inner pair spine-like, half as long as outer pair.

Females similar to males but uniformly orange-yellow in color, some specimens having venter and legs colored as in male; clytra hyaline, the orange-yellow dorsum showing through; ovipositor extending to tip of abdomen.

Male specimens taken from the Florida Keys were much lighter in color than the typical males, the wings being semi-hyaline having only the apical fifth fuscous. Parasitism is common, parasitized males resemble the females quite closely, being uniformly orange-yellow in color; parasitized females are darker in color, some specimens superficially resembling light colored males taken from the Florida Keys.

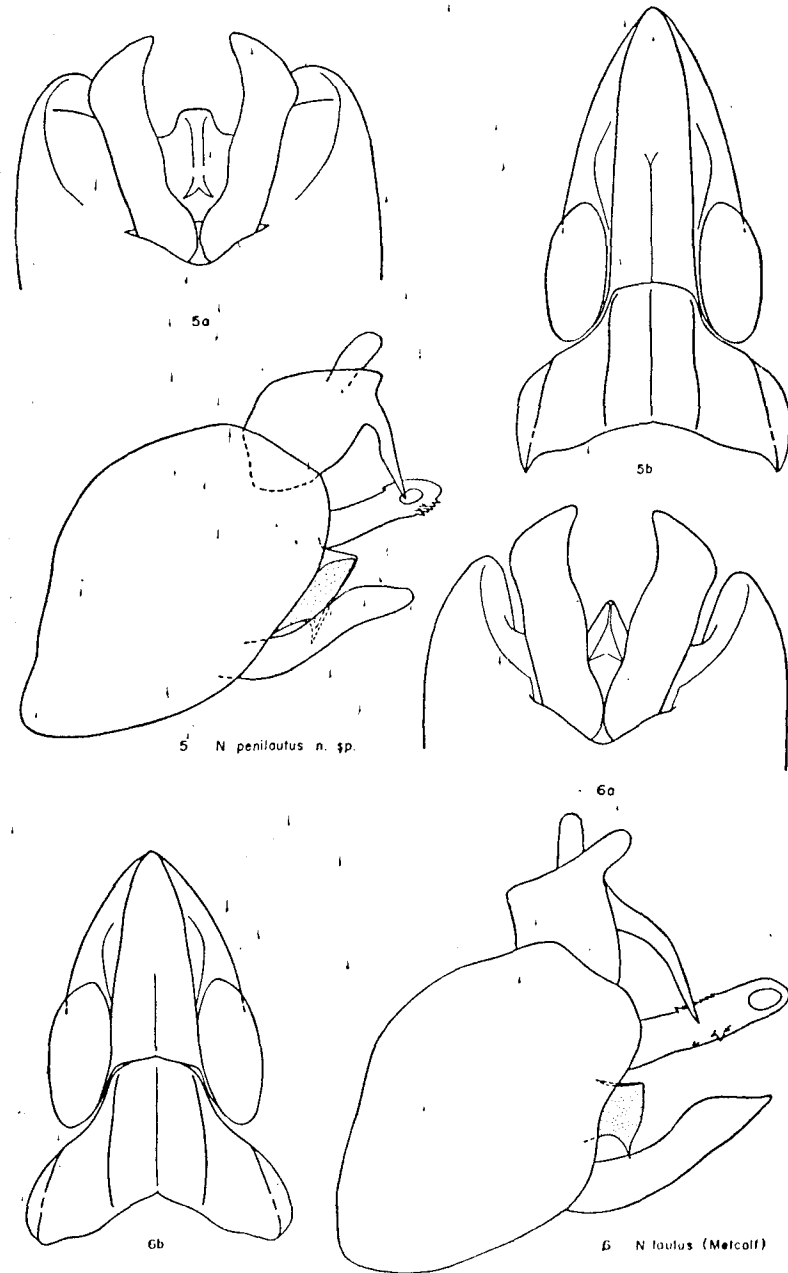
"Types: Holotype ♂, Atlantic City, New Jersey, August 25, W. J. Gerhardt; allotype ♀, Atlantic City, New Jersey, August 25, W. J. Gerhardt; paratype ♀, Pascagoula, Mississippi, August 6, 1921, H. L. Dozier."

In Z. P. Metcalf collection.

Additional material studied: Florida: Bahia Honda Key, Cedar Key, Long Key, Second Key, Yankee Town; Louisiana: Port Sulphur, Slidell; Maryland: Piney Point. All collected by R. H. Beamer.

EXPLANATION OF PLATE 2

- Fig. 3 *Tumidagena terminalis* (Metcalf), lateral view of pygofer and anal segment.
 Fig. 3a *Tumidagena terminalis*, ventral view of pygofer showing genital plates.
 Fig. 4b *Tumidagena terminalis*, dorsal view of head and pronotum.
 Fig. 4 *Tumidagena minuta* n. sp., lateral view of pygofer and anal segment.
 Fig. 4a *Tumidagena minuta*, ventral view of pygofer showing genital plates.
 Fig. 4b *Tumidagena minuta*, head and pronotum in dorsal view.



Macropterous form: Like the brachypterous form but with fully developed flight wings. Elytra four times as long as broad, apices broadly rounded; wings hyaline to semihyaline, some specimens having the apical fourth fumose or with a small fumose spot at apex.

The macropterous form closely resembles that of *elongatus* (Ball). The males may be definitely separated on the number of processes on the anal segment, four in *dorsalis* (Metcalf), two in *elongatus* (Ball). The females can be separated by the color of the legs, *dorsalis* being black and white, as is the brachypterous male, and those of *elongatus* being whitish-yellow as in the female of that species.

Holomorphotype ♂, allomorphotype ♀, 10 ♂ and 14 ♀ paramorphotypes, Piney Point, Maryland, August 26, 1946, R. H. Beamer; other paramorphotypes: 22 ♂♂ and 3 ♀♀, Bahia Honda Key, Florida, July 25, 1948; 5 ♂♂, Water Mill, Long Island, New York, August 18, 1946; 1 ♂, Fort Walton, Florida, June 27, 1948; 4 ♀♀, Slidell, Louisiana, June 25, 1948; all collected by R. H. Beamer. Types in Snow Entomological Collections.

Neomegamelanus elongatus (Ball)

Pl. 4

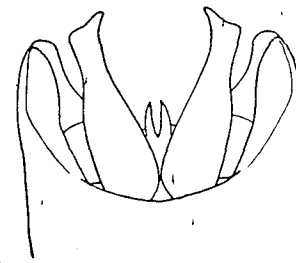
Megamelanus elongatus Ball, 1905, Proc. Biol. Soc. Wash., 18:118-119.

Macropterous form: Resembling macropterous form of *N. dorsalis* (Metcalf) but having two processes on anal segment instead of four and lacking characteristic black and white colored legs as in *dorsalis*. Length of male 2.5 mm. to 4 mm.; of female 4 to 4.5 mm.

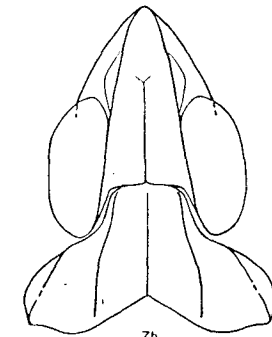
Structure: Crown about twice as long as width at base, projecting about half its length in front of eyes; elytra extending beyond end of abdomen a fourth to slightly more than a third their length, four times as long as broad, slightly widening toward apices, apex broadly rounded; veins whitish with a series of rather long black hairs evenly spaced along them; second antennal segment about two and one-half times as long as first, subglobular.

Color: General body color dirty stramineous with an inconspicuous lighter whitish stripe on dorsum extending length of head, pronotum and mesonotum; wings hyaline to semihyaline with variable sized fumose patches at apex; clypeus fulvous, in some specimens with sooty areas along margins and median carina; legs uniformly whitish, tarsal claws, spines on calcar, tibia and tarsi tipped with black; venter with base of segments reddish-brown and caudally margined with yellowish, a few specimens with entire abdomen excepting genital parts ochraceous; genital parts dark reddish-brown.

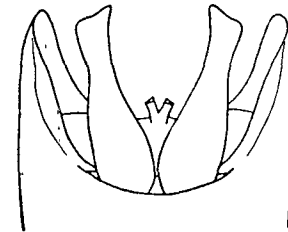
Genitalia: In lateral view pygofer longer than broad, caudal margin broadly rounded (see plate 4); aedeagus slender, elongate, with sides slightly elevated, margins coarsely serrated, apex broadly rounded; a group of from



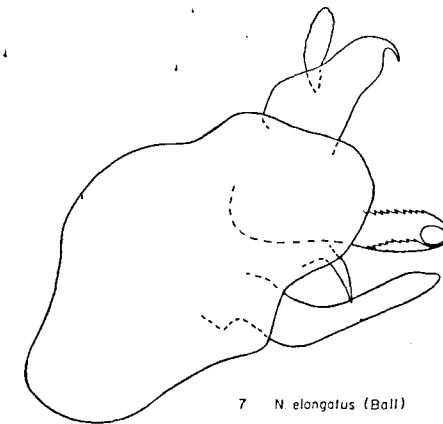
7a



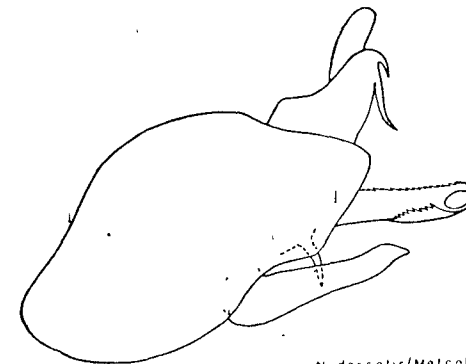
7b



8a



7 *N. elongatus* (Ball)



N. dorsalis (Metcalf)

EXPLANATION OF PLATE 3

- Fig. 5 *Neomegamelanus penilattus* n. sp., lateral view of pygofer and anal segment.
 Fig. 5a *Neomegamelanus penilattus* ventral view of pygofer showing genital plates.
 Fig. 5b *Neomegamelanus penilattus*, dorsal view of head and pronotum.
 Fig. 6 *Neomegamelanus luttus* (Metcalf), lateral view of pygofer and anal segment.
 Fig. 6a *Neomegamelanus luttus*, ventral view of pygofer showing genital plates,
 Fig. 6b *Neomegamelanus luttus*, dorsal view of head and pronotum.

EXPLANATION OF PLATE 4

- Fig. 7 *Neomegamelanus elongatus* (Ball), lateral view of pygofer and anal segment.
 Fig. 7a *Neomegamelanus elongatus*, ventral view of pygofer showing genital plates.
 Fig. 7b *Neomegamelanus elongatus*, dorsal view of head and pronotum.
 Fig. 8 *Neomegamelanus dorsalis* (Metcalf), lateral view of pygofer and anal segment.
 Fig. 8a *Neomegamelanus dorsalis*, ventral view of pygofer showing genital plates.

four to eight teeth on left side near apex; in caudal view styles about three times as long as broad at base, margins tapering for about two-thirds their length then widening apically, inner margin acuminate at apex; anal segment with a pair of stout, short processes, about half as long as dorsal margin in length, ventral margin twice as long as front margin.

Females similar to males, ovipositor extending to end of abdomen.

The macropterous form of this species closely resembles that of *dorsalis* (Metcalf), the males being separated by the number of processes on the genital tube, two in *elongatus*, four in *dorsalis*; the females by the color pattern especially the hind legs, those of *elongatus* being uniformly yellowish-white while those of *dorsalis* are contrasting black and white as in the male.

Types: Lectotype ♂ (here designated) Biscayne Bay, Florida, no further data on pin. In U. S. N. M.

Additional material studied: Connecticut: Mystic, Norwich; Florida: Sanford, Farmdale, Ft. Walton, Twenty-five miles west of Miami; Louisiana: Port Sulphur, Creole, Slidell; Maryland: Piney Pt.; Mississippi: Gulfport, Perlington, Pass Christian, Orange Grove; New York: Montauk, Long Island, Water Mill, Long Island; Virginia: Cape Henry. All collected by R. H. Beamer. Louisiana: Slidell, E. L. Todd; Florida: Sanford, C. O. Bare.

Brachypterous form: Only the females are at hand on which to describe this form. These are like the macropterous form but with the flight wings aborted; elytra about four times as long as broad, apices broad, extending beyond abdomen for about a fifth their length; veins whitish with a series of rather long black hairs evenly spaced along them; elytra hyaline to semihyaline with a small fumose spot at apex; body uniformly white to yellowish-orange in color, legs straw color with tarsal claws, spines on tibia, tarsi and teeth on calcar tipped with black; length female 3.5 to 4 mm.

The female of this form grades imperceptibly into the brachypterous female of *dorsalis* (Metcalf), a large series of both species taken from a number of different areas having specimens difficult to assign to either species.

Types: Holomorphotype ♀, paramorphotypes 21 ♀ ♀, Water Mill, Long Island, New York, August 18, 1946. Other paramorphotypes: Florida: Fort Walton, 15 ♀ ♀, Sanford, 2 ♀ ♀, Mims, 1 ♀; Louisiana: Port Sulphur, 10 ♀ ♀, Creole, 5 ♀ ♀; Maryland: Piney Pt. 18 ♀ ♀; Mississippi: Gulfport, 29 ♀ ♀ Wildwood State Park, Long Island, 2 ♀ ♀; Virginia: Cape Henry, 2 ♀ ♀. All collected by R. H. Beamer. Florida: Wakulla, 1 ♀, E. L. Todd.

Morphotypes in Snow Entomological Collections.

Neomegamelanus lautus (Metcalf)

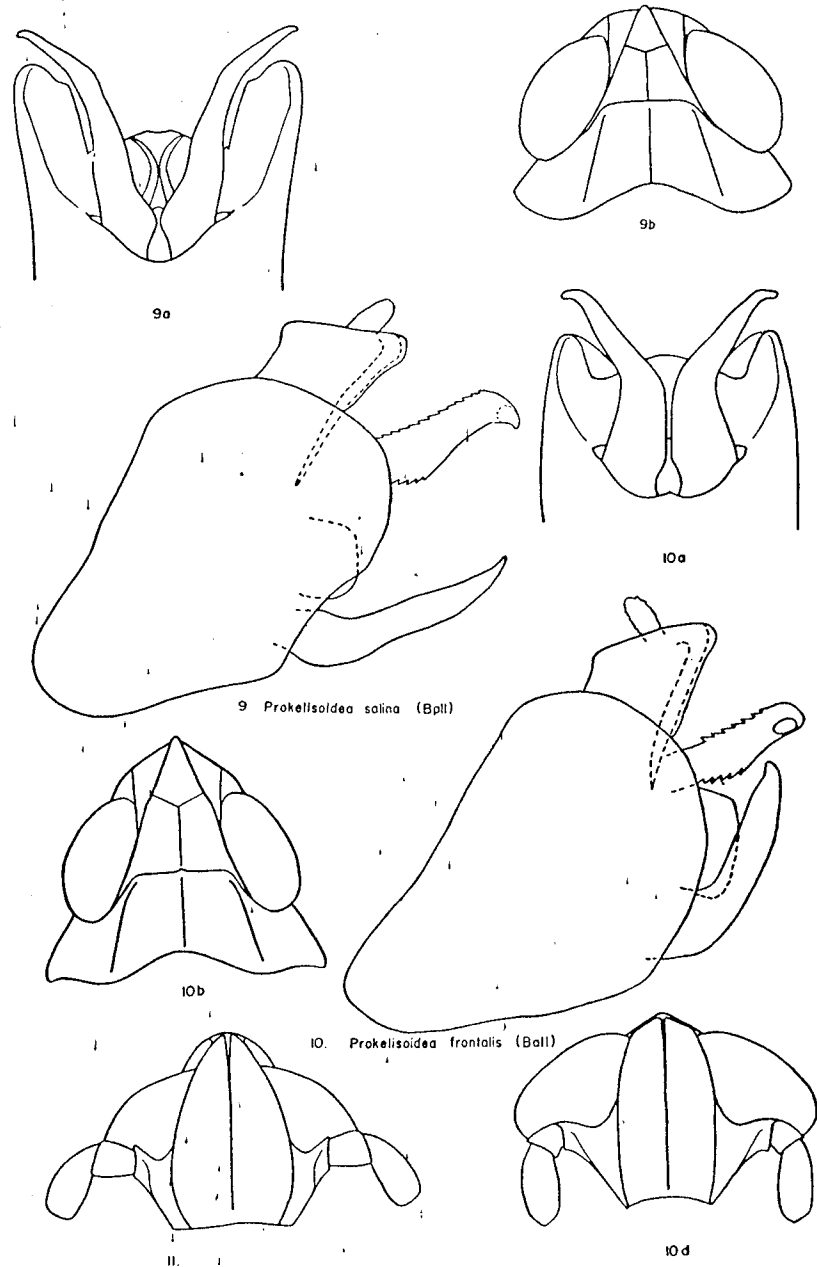
Pl. 3

Megamelanus lautus Metcalf, 1923, Jour. Elisha. Mitch. Sci., Soc., 38:200-201.

Brachypterous form: Resembles *N. dorsalis* (Metcalf) but elytra brownish fuscous with two characteristic whitish triangles opposing one another at outer fourth, one on front margin and one on the inner margin. Length ♂ 3-3.5 mm; ♀ 3.15-4 mm.

Except for the contradiction in regard to the anal styles Metcalf's description is accurate. The anal styles are three and one-half times as long as wide at base, with apical fourth acuminate, apices curved inward.

PLATE 5



Genitalia: In lateral view pygofer irregular in shape, longer than wide, margins regular, hind margin protuberant about level of aedeagus, longest at this point, upper corner broadly rounded (see plate 3); aedeagus with sides compressed, short blade-like, slightly wider just before apex; apex broadly rounded, upper margin coarsely serrate on about middle third, teeth variable in number, sides near lower margin about middle of shaft with a small group of two to five teeth; each side of anal segment with a conspicuous lobe on upper corner of hind margin, about same length as ventral margin of anal segment; styles stout, almost four times as long as wide, equal in width, for basal three-fourths, apical fourth acuminate, apices slightly curve inward.

Additional material studied: Mexico: Vera Cruz, Vera Cruz; Texas: Aransas Pass, Angleton, Brownsville, Corpus Christi, Sinton. All collected by R. H. Beamer.

Macropterous form: Like brachypterous form but with fully developed flight wings; wings extending beyond apex of abdomen about one-fourth their length; color pattern of male similar to brachypterous male, elytra smoky to black with two large whitish triangles opposing one another near apex, one on front margin, one on the inner margin; female with elytra semihyaline to fumose, lacking the characteristic whitish triangles of the male although in some specimens a faint indication of it is present; wing veins of elytra black except in whitish triangles where they are white, veins bearing a number of small black hairs.

Types: Holomorphotype ♂, allomorphotype ♀, 11 ♂ and 14 ♀ paramorphotypes, Brownsville, Texas, December 27, 1945. Other paramorphotypes: Louisiana: Cameron, 1 ♂ and 4 ♀ ♀; Mexico: Vera Cruz, Vera Cruz, 2 ♂ ♂ and 1 ♀ ♀; Texas: Brownsville, 10 ♂ ♂ and 11 ♀ ♀, Corpus Christi, 3 ♂ ♂ and 1 ♀ ♀; twenty-five miles south of Sarita, 2 ♂ ♂ and 7 ♀ ♀, Sinton, 1 ♀ ♀. All collected by R. H. Beamer. Types in the Snow Entomological Collections

Neomegamelanus penilautus n. sp.
Pl. 3

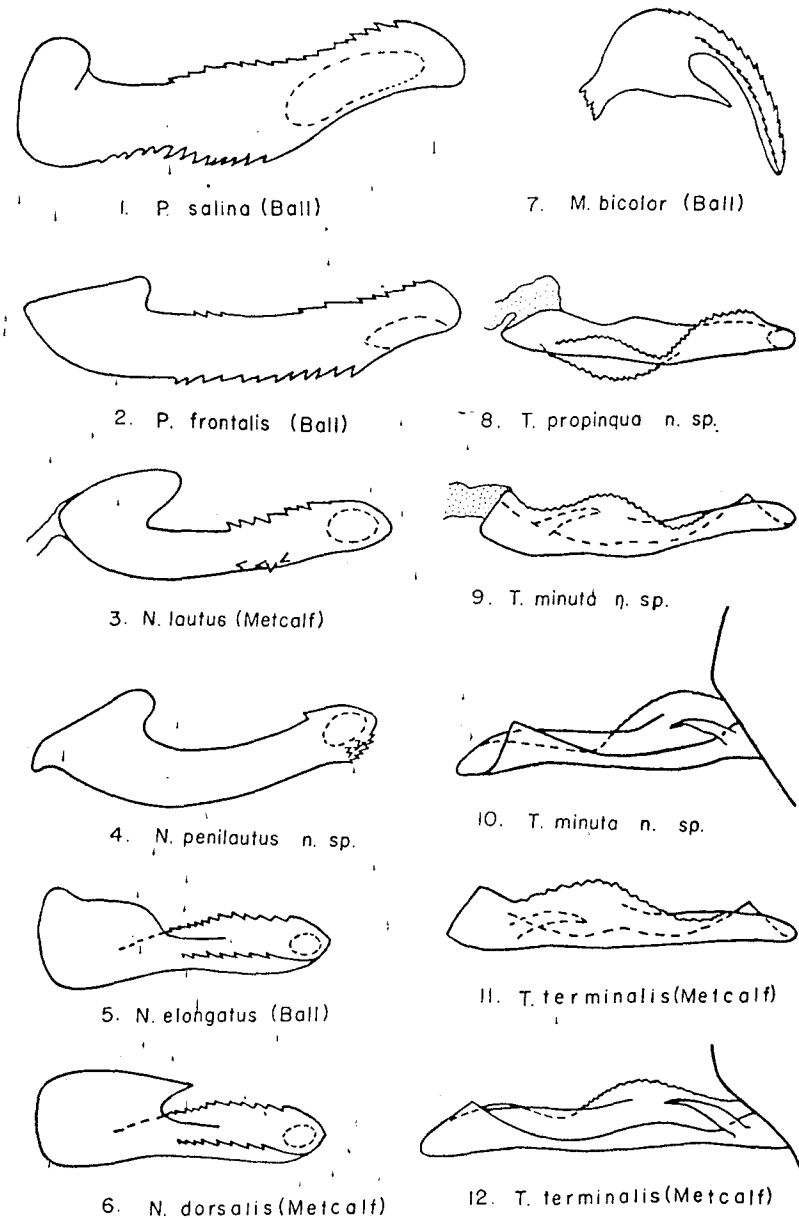
Brachypterous form: Resembling *N. lautus* (Metcalf) and closely related but lacking the lobes on upper hind margin of genital segment and with head about three times as long as wide at base; length ♂ 3 mm.; ♀ 4 mm.

Structure: Head projecting about three-fifths length of crown in front of eyes; elytra extending beyond apex of abdomen for about a fourth their length, four times as long as broad, apex broadly rounded, surface gently undulate; veins black with a series of small black hairs uniformly spaced, distributed along them; second antennal segment about twice as long as first, subglobose.

EXPLANATION OF PLATE 5

- Fig. 9 *Prokelisoidea salina* (Ball) lateral view of pygofer and anal segment.
Fig. 9a *Prokelisoidea salina*, ventral view of pygofer showing genital plates.
Fig. 9b *Prokelisoidea salina*, dorsal view of head and pronotum.
Fig. 10 *Prokelisoidea frontalis* (Crawford), lateral view of pygofer and anal segment.
Fig. 10a *Prokelisoidea frontalis*, ventral view of pygofer showing genital plates.
Fig. 10b *Prokelisoidea frontalis*, dorsal view of head and pronotum.
Fig. 10c *Prokelisoidea frontalis*, ventral view of clypeus showing shape.
Fig. 11 *Prokelisia*, ventral view of clypeus showing general shape.

PLATE 6



Color: Dorsal surface of head, prothorax, and mesothorax pale yellowish-white, becoming fuscous at the sides; wings opaque, piceous, a trace of yellow along commissural margin, two large whitish triangles opposing one another at outer fourth of wing, one on front margin and one on inner margin; wings with a highly polished surface; clypeus fuscous, in some specimens an ochraceous line in place of apical portion of median carina; legs uniformly whitish with tarsal claws, spines on calcar, tibia and tarsi tipped with black; venter with base of segments fumose with margins yellowish, genital capsule fumose, one specimen with entire venter including genital capsule straw color.

Genitalia: In lateral view pygofer irregular in shape (see plate 3); hind margin broadly rounded at upper corner, widest at level of aedeagus; aedeagus with sides compressed, shaft phaliform, upper margin free of serrations but may bear a spine near apex, lower margin and sides of shaft free of serration or spines, a small group of teeth at lower margin of glans-like apex; in caudal view styles, five times as long as wide at the middle, apical fourth acuminate, apices slightly curved inward; and segment with a pair of straight, stout processes projecting from posterior ventral margin, about equal to dorsal margin in length.

Females like male but with body uniformly pale yellowish-orange with hyaline to semihyaline elytra bearing a small fumose spot at apex.

Types: Holotype ♂, allotype ♀, 4 ♂ and 3 ♀ paratypes, Big Pine Key, Florida, July 25, 1948, R. H. Beamer; other paratypes: 2 ♀ ♀, Yankee Town, Florida, July 7, 1948, R. H. Beamer; 1 ♀, Yankee Town, Florida, March 9, 1947, R. H. Beamer.

Macropterous form: Only the female has been taken. It resembles the brachypterous male but with fully developed flight wings. The color pattern is essentially that of the brachypterous male but having the crown, pronotum and mesonotum a deep lemon yellow sharply contrasting with smoky-black sides of pronotum and mesonotum.

Holomorphotype ♀, Yankee Town, Florida, March 9, 1947, R. H. Beamer; paramorphotype, 1 ♀, Tampa, Florida, July 20, 1934, R. H. Beamer. Types in Snow Entomological Collections.

EXPLANATION OF PLATE 6

- Fig. 1 *Prokelisoidea salina* (Ball), aedeagus in lateral view.
 Fig. 2 *Prokelisoidea frontalis* (Crawford), aedeagus in lateral view.
 Fig. 3 *Neomegamelanus lautus* (Metcalf), aedeagus in lateral view.
 Fig. 4 *Neomegamelanus penilautus* n. sp., aedeagus in lateral view.
 Fig. 5 *Neomegamelanus elongatus* (Ball), aedeagus in lateral view.
 Fig. 6 *Neomegamelanus dorsalis* (Metcalf), aedeagus in lateral view.
 Fig. 7 *Megamelanus bicolor* Ball, aedeagus in lateral view.
 Fig. 8 *Tumidagena propinqua* n. sp., aedeagus in lateral view.
 Fig. 9 *Tumidagena minuta* n. sp., aedeagus lateral view of left side.
 Fig. 10 *Tumidagena minuta* showing aedeagus in lateral view of right side with fang-like spine at base.
 Fig. 11 *Tumidagena terminalis* (Metcalf), aedeagus in lateral view, left side.
 Fig. 12 *Tumidagena terminalis* showing aedeagus in lateral view of right side with fang-like spine at base.

Prokelisoidea n. gen.

Resembling *Prokelisia* Osborn but clypeus rectangular; resembling *Megamelanus* Ball but without a deep notch in hind margin of pygofer. Head truncate in macropterous form, in brachypterous form may be somewhat pentagonal; lateral carinae of vertex meeting at apex of crown imparting to disc of vertex a triangular appearance; median carina "Y" shaped, obscure in some specimens, extending to front margin of eyes, arms of stem extending obliquely forward to lateral carinae of vertex; a small arcolelet at apex of crown formed by arms of "Y" shaped median carina and lateral carinae of vertex. Pronotum wider than head, front margin extending into hind margin of crown to about middle of eye; caudal margin sinuate, concave, forming a shallow inverted "W" in outline; tricarinate, lateral carinae straight, diverging moderately and attaining hind margin. Clypeus rectangular, about twice as long as wide at base, lateral margins slightly convex. Calcar two-thirds as long as first tarsal segment including apical spines, strongly and uniformly toothed. First antennal segment as long as wide; second antennal segment twice as long as first.

Type species: *Prokelisoidea salina* (Ball)

Prokelisoidea salina (Ball)

Pl. 5

Kelisia salina Ball, 1902, Can. Ent., 34:264

Megamelanus kalina Beamer, 1945, Jour. Kansas Ent. Soc., 18:100.

Macropterous form: Resembling *Prokelisia setigera* Osborn but clypeus rectangular with margins slightly convex; resembling *Prokelisoidea frontalis* (Crawford) but styles straight on basal half, sharply diverging on apical half; length ♂ 2 mm.; ♀ 2.5 mm.

Structure. Crown projecting in front of eyes for a third its length, slightly longer than wide at base; lateral carinae of head strongly elevated at base less so anteriorly; straight, meeting at apex of vertex; clypeus slightly more than twice as long as wide at base, slightly convex on sides; pronotum slightly wider than head; elytra hyaline to semihyaline, three times as long as broad, margins subparallel, broadest near apex, extending beyond end of abdomen for about half their length; apex broadly rounded, veins whitish, in some specimens becoming brown near apex of wing, setiferous, with small black hairs, closely appressed behind.

Color: Head, pronotum and mesonotum straw color to bright orange-yellow; abdomen in male varying from smoky to black with caudal margins of segments lighter in color; frontal carinae margined with reddish-brown; legs smoky becoming whitish on hind pair; spines on tibia, calcar, and tarsi tipped with black; tarsal claws black; females similar to males but venter uniformly yellowish in color with the ovipositor and frontal carina margined with brown.

Genitalia: In lateral view pygofer irregular in shape with hind margin broadly rounded, slightly longer than wide, all margins regular; aedeagus in lateral view with apex avicephaliform, upper and lower margins of shaft coarsely serrated except apical third of lower margin which is shallowly concave; in caudal view genital styles four times as long as width at base, widely

diverging and sharply tapering from base to apices; anal segment with pair of long processes at middle about one and one-half times as long as ventral margin and closely embracing aedeagus.

Types: Lectotype ♀, Grand Junction, Colorado, designated by Beamer, *Journal Kansas Entomological Society*, 18: July 1945, (3):100. In U.S.N.M.

Additional material studied: Arizona: St. Johns, Chiricahua Mts., Ajo, Flagstaff, Babaquivari Mts., Arivaca; California: Lone Pine, Ventura; Colorado: Peyton, Grand Junction, Palisades; Idaho: Nampa; Kansas: Phillips Co.; New Mexico: Alamogordo, Elkins, Elk, Cowles, Belen, Malaga, Ruidosa, Kenna, Hillsboro, Hope, Grady, Moriority, Mescalero, Roswell, Socorro, Springer, Silver City, Tularosa, Wagonmound, White Sands; Oregon: Dixie; Texas: Coreizo, Ft. Stockton, Laredo, 10 mi. S. E. Pecos, Rocksprings, Vernon; Utah: Elsinore, Glenwood, Goshen; Washington: Toppenish, Sprague.

Brachypterous form: General appearance of brachypterous form of *Megamelanus bicolor* Ball but with elytra extending almost to or beyond end of abdomen; resembling brachypterous form of *Prokelisoidea frontalis* (Ball) but with veins on elytra setiferous with small black hairs evenly spaced; flight wings aborted, about one-fifth as long as elytra; in dorsal view head more pointed than macropterous form being pentagonal rather than truncate. Pronotum much wider than head. Otherwise like the macropterous form. Females with body dirty straw-colored to orange-yellow in some specimens; ovipositor and margin of venter with a few smoky spots.

Material studied: California: Palm City; Colorado: Alamosa, Buckhorn Creek; Kansas: Hutchinson; New Mexico: Alamogordo, Santa Fe, Wagonmound; Utah: Kanab; Wyoming: Laramie. Collected by R. H. Beamer and D. R. Lindsey.

Prokelisoidea frontalis (Crawford)

Pl. 5

Megamelanus frontalis Crawford, 1914, *Proc., U.S.N.M.* 46:593.

This species is similar and closely related to *Prokelisoidea salina* (Ball). The brachypterous forms of the two species can be separated by the presence or absence of setae on the veins of the elytra. The setae are present in *P. salina* (Ball) and absent in *frontalis* (Crawford).

Brachypterous form: Resembling *Prokelisoidea salina* (Ball) but no setae on veins of elytra. Length male 2.5 mm.; female 2.5 mm.

Structure: Crown projecting half its length in front of eyes; elytra extending about one-fourth their length beyond end of abdomen in ♂, less in ♀; about three times as long as broad, veins whitish, without setae, more or less pointed at apex, surface pruinose.

Color: Head, pronotum and mesonotum uniformly stramineous; abdomen fumose to blackish; elytra pruinose; apex of head, lateral fovea of head with dark reddish-brown traces; frontal carinae margined with dark reddish-brown; legs straw-colored becoming whitish on hind legs; spines on tibia, calcar and tarsi tipped with black; tarsal claws black; females similar to males but with body uniformly orange-yellow in color.

Genitalia: In lateral view pygofer somewhat triangular, longer than broad, apices broadly rounded, all margins regular (see plate 5); in caudal view

genital styles four times as long as wide at base, widely diverging and tapering from middle to apex; anal segment with a pair of long slender processes at the middle which extend ventro-cephalad to about middle of aedeagus; aedeagus in cross section a narrow wedge; in lateral view shaft with sides parallel, about six times as long as broad, upper and lower margins coarsely serrated except apical third of lower margin which lacks the serrations and is slightly concave; apex broadly rounded.

Types: Holomorphotype ♂, Las Animas, Colorado, August 20, 1936, R. H. Beamer; allomorphotype ♀, Garden of the Gods, Colorado, August 19, 1936, R. H. Beamer; paramorphotypes: 5 ♂♂, Garden of the Gods, Colorado, August 19, 1936, R. H. Beamer; 5 ♀♀, Las Animas, Colorado, August 20, 1936, R. H. Beamer; 1 ♂ and 5 ♀♀, Santa Fe, New Mexico, July 20, 1936, D. R. Lindsey; 1 ♂ and 1 ♀, Stafford Co. Salt Marsh, Kansas, June 25, 1936, R. H. Beamer; 3 ♂♂ and 1 ♀, Lamar, Colorado, August 20, 1936, M. B. Jackson; 1 ♂ and 1 ♀, Medora, Kansas, June 24, 1936, D. R. Lindsey; 1 ♂ Vineland, Colorado, August 20, 1936, R. H. Beamer. Morphotypes in Snow Entomological Collections.