

THE GENUS ACANALONIA IN AMERICA NORTH OF
MEXICO

(Fulgoridae, Homoptera)

BY

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**THE GENUS ACANALONIA IN AMERICA NORTH OF
MEXICO (Fulgoridae, Homoptera).**

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The purpose of this paper is to give as nearly as possible a comprehensive systematic resume of the genus *Acanalonia* (Fulgoridae, Homoptera) in America, north of Mexico. Recent studies have included only the eastern and southeastern forms. This paper is an attempt at a comparative study of all previously described species. Descriptions of five new species are included in the text and a key to all North American forms has been devised.

From the discussion found in the three outstanding recent publications concerning the classification of the Fulgoridae, namely, those of Dozier¹, Muir², and Metcalf³, it is apparent that the status of the family Fulgoridae as it stands in the literature at the present time is questionable. Muir makes the most radical departure of the three by dividing the Homoptera into two superfamilies, the Cicadoidea and the Fulgoroidea, and the latter then divided into numerous families of which twelve represent the more common subfamilies and genera listed for the United States. Metcalf, although agreeing that the old family Fulgoridae is too comprehensive, makes no departure from the commonly accepted view. Dozier seems to take a position somewhat between these two. Without a study of the complete group of the Fulgoridae the author prefers to follow Dozier's general classification, believing it to be logical and at the same time not too radical.

¹Dozier, Herbert. The Fulgoridae or Plant-hoppers of Mississippi, Including Those of Possible Occurrence. Miss. Agric. Exp. Sta. Bull. 14, 1926.

²Muir, F. On the Classification of the Fulgoroidea (Homoptera). Proc. Haw. Ent. Soc., V, No. 2, 1923.

³Metcalf, Z. P. A Key to the Fulgoridae of Eastern North America with Descriptions of New Species. Jour. Elisha Mitchell Sci. Soc., XXXVIII, 1923.

This classification is as follows:

Order Homoptera Latr.

Group I. *Auchenorhynchi* Amyot and Serville.

I. Superfamily Cicadoidea.

II. Superfamily Fulgoroidea.

Family I. Fulgoridae.

- Subfamily
1. Fulgorinae.
 2. Dictyophorinae.
 3. Achilinae.
 4. Cixiinae.
 5. Tropiduchinae.
 6. Issinae.
 7. Acanaloniinae.
 8. Flatinae.
 9. Derbinae.

Family II. Delphacidae.

Group II. *Sternorhynchi* Amyot and Serville.

Superfamily FULGOROIDEA.

Antennae placed on the side of the head below the eyes, very variable in shape and size, usually of two segments terminated by a very fine hair or bristle, rarely with basal appendages (*Otiocerus*); sense organs on antennae numerous and generally of a complex nature and mostly situated on the second segment; middle coxae articulated considerably apart allowing for considerable range of movement, as opposed to those of Cicadoidea, which are closer together and allow for very limited movements; hind coxae immobile and exterior part coalesced with metathorax; no filter present between mid-intestine and crop; ovipositor with the exception of Delphacidae and part of Cixiinae greatly reduced or incomplete, anterior and middle pairs of valves not fastened together by tongue-and-groove arrangement as in the Cicadoidea. Prothorax normally developed and unarmed.

Family FULGORIDAE.

Separated from the Delphacidae by not having a movable spur at apex of hind tibiae. Other characteristics those of the superfamily.

Subfamily ACANALONINAE (Amyot and Serville).

Elytra tectiform, held vertical with the costal margin meeting below the abdomen, closely reticulated over the whole surface; costa and apical margins without transverse veins; clavus not granulated, no spines on hind tibiae; front coalescent with vertex, usually without any transverse carina between them at apex of head.

COMPARATIVE NOTES.

This subfamily resembles the Flatinae and certain genera of the Issinae. It is separated from the Flatinae by having the elytra without cross-veins on the costal margin, not granulated on the clavus and spineless hind tibiae. It is separated from

the Issinae by having the elytra meeting below the abdomen, the front not usually separated from vertex by a transverse carina at apex of head, and by spineless hind tibiae.

Genus *Acanalonia* Spinola.

Head about as wide as thorax. Clypeus without lateral carinae. Vertex straight or somewhat angularly rounded anteriorly. Postclypeus flat, almost quadrangular, sometimes a longitudinal median carina and also two small lateral carinae present. Antennae short. Ocelli small. Pronotum usually without carinae, with sometimes a median carina. Posterior margin of pronotum straight or only slightly concave. Mesonotum large. Elytra steeply tectiform, reticulated with a network of veins, the longitudinal ones more prominent; elytra usually green in color with sometimes brown dots or lines at apex. Ovipositor incomplete. Oedagus complex, penis and periandrium appear to be amalgamated into a complete tube with appendages.

HISTORICAL REVIEW.

The subfamily contains only five or six genera of which only the genus *Acanalonia* is represented in the United States. Melichar⁴ in 1902 monographed the family. In this group he included the following genera: *Amphiscepa*, *Acanalonia*, *Chlorochara*, *Batusa*, *Thiscia* and *Parathiscia*. Van Duzee (Catalogue, 1919) states that the true genus *Amphiscepa* Germar is an *Issid* genus and has for type *nodipennis* Germar, and of which *Issocepa* Melichar is a synonym. There has, according to him, never been a genus *Amphiscepa* Say as stated by Melichar. The genus *Chlorochara* according to Melichar occurs in Puerto Rico, the genus *Batusa* in Central America, Mexico and Puerto Rico, the genus *Thiscia* in South America and the genus *Parathiscia* in Africa. It is therefore quite probable that besides the genus *Acanalonia* the first two of the list may at some time be found in the United States.

Melichar (1902) lists seventeen species in the genus *Acanalonia* of which five are recognized North American species. He lists *bivittata* in the genus *Amphiscepa* Say. Van Duzee (Catalogue, 1919) lists nine species. Dozier (1926) lists five species from eastern United States and states that there are nine species in the United States. Metcalf (1923) in his key to Fulgoridae of the United States, keys out nine species. These nine species, however, do not coincide exactly with the

⁴Melichar, L. 1902. Monographie der Acanaloniiden and Flatiden (Homoptera).

nine listed by Van Duzee. He leaves out *A. mollicula* Van Duz. and *A. clypeata* Van Duz., two western species, and adds *virescens* Stal and *fasciata* Metcalf, a new species.

Considering the United States as a whole it brings the total number of species up to eleven. To this the writer is adding five new species, which makes it possible to have sixteen species occurring in North America north of Mexico.

The writer does not consider that *bivittata* should be placed in a separate genus from *Acanalonia* or that these fifteen species should be divided into two genera. There seems to be no constant character by which one can consistently group these species into two groups such as was used by Melichar when he stated, "head as wide as pronotum" or "frons nearly twice as broad as long." The wing venation apparently cannot be used as it differs considerably in the same species and even when apparent differences between the veins of two species can be followed they seem too slight for generic value.

KEY TO SPECIES OF ACANALONIA.

1. With a prominent median carina across vertex, pronotum, and mesonotum; large insects; length usually well over 9 mm. 2
Without a prominent continuous median carina across head and thorax; length generally well under 9 mm. 3
2. (1) Length 9 to 12.5 mm.; costal margin of elytron broadly rounded. (Page 762). **latifrons**
(1) Length 14-15 mm.; costal border of elytron nearly straight posteriorly. (Page 764). **servillei**
3. (1) Color uniform but with two prominent broad brown stripes on the lateral margins of vertex and thorax which extend along the inner margins to the apex of the clavus. 4
(1) Color uniform with only occasional fuscous shadings along inner margin or small fuscous dashes on apical margin; no brown stripes present. 5
4. (3) Reticulation lacking at base of elytra; smaller in size, length varying from 4.2 to 6.2 mm. (Page 765). **fasciata**
(3) Reticulation prominent over all the elytra; generally much larger, length varying from 5.23 to 8.4 mm. (Page 766). **bivittata**
5. (3) Vertex conically or broadly triangularly produced beyond eyes, *grandicella* sometimes excepted. 6
(3) Vertex truncate or broadly rounded in front, generally not greatly produced beyond eyes. 10
6. (5) Vertex greatly produced conically. (Page 768). **conica**
(5) Vertex not greatly produced conically, at most triangular before. 7
7. (6) Postclypeus large and tumid. 8
(6) Postclypeus normal, not large and tumid. 9
8. (7) Elytra broadest anterior to middle, narrowed apically; vertex distinctly triangularly produced. (Page 769). **clypeata**
(7) Elytra broadest apically, not narrowed; vertex more roundingly produced, depressed across disc. (Page 771). **grandicella**
9. (7) Costal margin rounding and apex of elytra greatly narrowed; reticulation not prominent at base of elytra. (Page 772). **mollicula**
(7) Costal margin rounding but elytra not narrowed apically; reticulation prominent over entire elytron. (Page 773). **virescens**

10. (5) Elytron trapezoidal with greatest width at apex; larger insects varying from 6.3 to 7.2 mm. (Page 774).....*immaculata*
 (5) Elytron either hemispherical with greatest width near middle or else much narrowed at apex; smaller insects, under 6 mm.....11
11. (10) Vertex considerably extended cephalad beyond eyes, anterior margin rounding but forming sharp angles at junction with lateral margins.....12
 (10) Vertex not protruded greatly beyond eyes, either truncate or with anterior margin gradually rounding from eyes.....13
12. (11) Reticulation of elytron much heavier; elytron considerably narrowed apically. (Page 776).....*similis*
 (11) Reticulation of the elytron scarcely visible on basal and costal areas; costal margins broadly rounding, not particularly narrowed apically. (Page 775).....*invenusta*
13. (11) Vertex gradually rounding from eyes; no visible carina between vertex and postclypeus; costal margin at most narrowly reflexed; heavy reticulation. (Page 778).....*pumila*
 (11) Vertex truncate with a visible carina between it and postclypeus; costal margin of elytron greatly expanded.....14
14. (13) Greatest width of elytron approximately at apex of clavus; reticulation light; costal margin more greatly expanded. (Page 779).....*laticosta*
 (13) Greatest width of elytron anterior to apex of clavus; reticulation heavier; costal margin somewhat less expanded; smaller in size, at least under 4.35 mm. (Page 780).....*parva*

Acanalonia latifrons (Walker).

(Plates I, III and IV.)

- Walker, Francis. List Homop. in British Museum, II, p. 457. *Poeciloptera*.
 Dozier, Herbert. Miss. Agric. Exp. Sta., A. and M. College Bull. 14, p. 108, 1926. *Acanalonia*.
 Metcalf, Z. P. Jour. Elisha Mitchell Scientific Soc., Vol. XXXVIII, pp. 139-230, 1923.

DESCRIPTION.

Size: Length, ♀, 10.8-12.4 mm.; ♂, 8.7-10.2 mm. Width across eyes, 2.1-2.7 mm. Greatest width of elytron, ♀, 6-6.8 mm.; ♂, 4.65-5.85 mm.

Shape: A large, trapezoidal species with a large, humped thorax as viewed from the side and a very blunt head, greatest width of elytron somewhat anterior to apex of clavus and costal margin of elytron broadly rounded.

Color: General color light green. Vertex and thorax mottled yellowish-green with a distinct yellow band following the prominent median carina. Elytron light green with costal margin and inner margin to apex of clavus yellow. Outer margin and apical portion of inner margin brown, also dark brown cross-dashes in the cells just cephalad of margin. Postclypeus mottled greenish-yellow, anteclypeus tannish across the disc. Eyes reddish, mottled with light. Ventral part of body whitish-green. Coxae of all the legs and also femora and tibiae of hind legs pale. Femora, tibiae, and tarsi of front and middle legs dark brown, the femora mottled with round, pale spots.

Structural Details: Head as viewed from above somewhat produced cephalad beyond eyes, its anterior margin drawn out into a sharp

median angle. A very sharply raised carina across pronotum, mesonotum, vertex and continuing on the postclypeus for a short distance. Vertex and pronotum on median line subequal, the latter, usually slightly longer. Lateral margins of vertex divergent, the laterocephalic angles projected slightly cephalad. Greatest width of eye a trifle greater than one-third the width of the space between the eyes. Ocelli large and distinct. Antennae typical for the genus, situated in a raised cup-like portion of the gena, the scape ring-like, pedicel bulbous, clavola bulbous at base, black in color, rest setaceous. Postclypeus broad, wider than long, posterior margin indistinguishably sloping into vertex, lateral margins slightly divergent anteriorly to about the middle, then convergent to meet anteclypeus, median carina very distinctly produced posteriorly, only faintly indicated anteriorly. Anteclypeus slightly inflated, invaginated into postclypeus for about one-third the length of the latter and its median length equal to lateral margin of postclypeus. Labrum long, approximately one-half length of anteclypeus. Pronotum as wide as width of head across the eyes, anterior margin roundly produced, lateral margins short and slightly divergent, posterior margin broadly and shallowly emarginate. Mesonotum subequal in length and width, the median carina very distinct and two round depressions indicated posteriorly. Elytron roughly trapezoidal, the costal margin broadly arched, at base sharply reflexed, the outer margin weakly convex. M vein dividing into M_{1+2} and M_{3+4} near main trunk of Sc, R, and M; M_{3+4} simple throughout, unbranched; M_{1+2} curving cephalad so that veins Sc, R, and M are crowded together nearer the costal margin than in the other species, short, its branches evident before apical reticulated area. Wings milk-white, as long as elytra. Posterior margin of last complete ventral segment of female sinuate, at the middle slightly produced caudad into a broad, very shallow round lobe, the extreme lateral angles produced caudad considerably.

Comparative Notes: See under this heading in the description of *servillei*.

Distribution: Van Duzee's catalogue records this species from North Carolina, Georgia, Florida and Louisiana. Dozier adds Mississippi to this list. R. H. Beamer took one specimen in Batesburg, South Carolina and the Snow collection had one specimen from Pennsylvania.

Hosts: Dozier reports that numbers of this species have been taken by sweeping roadside vegetation and many were also taken on young pecan nursery stock in Mississippi. He states that "the native host plant is not known but probably will prove to be hickory." John B. Gill took one specimen in Havana, Florida, on pecan.

Acanalonia servillei Spinola.

(Plates I, III and IV.)

Spinola. Sur les Fulgorelles. Ann. Soc. Ent. France, Ser. I, VIII, p. 448, 1839.

DESCRIPTION.

Size: Length, ♀, 14.4 mm. Width across eyes, 3 mm. Greatest width of elytron, ♀, 8.4 mm.

Shape: A large, trapezoidal species with blunt head and greatest width of elytron at, about, or caudad to, apex of clavus and costal border of elytron nearly straight posteriorly.

Color: Testaceous-green in preserved specimens, probably bright green in life. Head and thorax uniformly testaceous or greenish (?). Elytra testaceous-green with inner margin as viewed from side faintly brown and delicate brown cross-streaks between the apical veins or apical margin. Clypeus and ventral part of body uniformly yellowish-testaceous. Eyes reddish-brown, mottled with light. Coxae and femora of all the legs and tibiae of hind legs pale. Tibiae of front and middle legs and all the tarsi dark brown, the femora mottled with round, pale spots.

Structural Details: Head as viewed from above somewhat produced cephalad beyond eyes; its anterior margin somewhat conical. A very sharply raised carina across pronotum, mesonotum, vertex and continuing on to the postclypeus for a short distance, more pronounced on mesonotum than anteriorly. Pronotum on median line only slightly longer than vertex. Lateral margins of vertex divergent, the laterocephalic angles projected slightly cephalad. Greatest width of eye approximately one-third the distance of vertex between the eyes. Ocelli very large and distinct. Antennae typical for the genus, situated in a raised cup-like portion of the gena, scape ring-like, pedicel bulbous, clavola bulbous at base, black in color, rest setaceous. Postclypeus broad, wider than long, posterior margin sloping indistinguishably into vertex, lateral margins subparallel for two-thirds their length, then converging to meet the anteclypeus, median carina distinct posteriorly, obsolete anteriorly. Anteclypeus slightly tumid, invaginated into postclypeus for about one-third length of latter. Pronotum as wide or slightly wider than width of head across the eyes, anterior margin roundly produced, lateral margins short and slightly divergent, posterior margin broadly and shallowly emarginate. Mesonotum approximately one-sixth longer than wide, the median carina very distinct and two round depressions indicated posteriorly. Elytron roughly trapezoidal, the costal margin rounded anteriorly, but nearly straight posteriorly, at base sharply reflexed. Venation, longitudinal veins standing out more distinctly although the cross veins are very prominent also; M vein dividing into M_{1+2} and M_{3+4} near main trunk of Sc, R and M; M_{3+4} branched at extreme apex of wing; M_{1+2} curving cephalad so that veins Sc, R and M are crowded together nearer the costal margin than in other species, short, its branches evident before apical reticulated area. Wings milk-white, as long as elytra. Posterior margin of last complete ventral abdominal segment of the female

sinuate, at the middle produced slightly caudad into a broad, very shallow, round lobe, the extreme lateral angles produced caudad considerably.

Comparative Notes: From the one specimen available for study loaned by Dr. Metcalf, the author was not able to discover any outstanding differences between this species and that of *latifrons*. In the literature the sizes are given as 10–13 mm. for *latifrons* and 14–15 mm. for *servillei*. Metcalf points out the difference between the rounding costal margin of *latifrons* and the more straight margin of *servillei* which is indicated in the drawings on Plate I. This makes the greatest width of the elytron much more cephalad in *latifrons* than in *servillei*, which is at about the apex of the clavus or slightly caudad to it. Other minor differences are that the lateral margins of the postclypeus are more nearly straight in *servillei* than in the other and that M_{1+2} which is apparently always simple in *latifrons* is branched, at least at the tip, in *servillei*.

Distribution: Melichar lists it from South America, Cuba, Jamaica and Florida. Amyot and Serville list it from Pennsylvania. Mr. Z. P. Metcalf sent the writer one from Cuba. Apparently this is a very rare North American species.

Acanalonia fasciata Metcalf.

(Plates I, III and IV.)

Metcalf, Z. P. Journ. Elisha Mitchell Sci. Soc., XXXVIII, p. 190, 1923.

DESCRIPTION.

Size: Length, ♀, 4.9–6.2 mm.; ♂, 4.2–5.6 mm. Width across eyes, 1.39–1.68 mm. Greatest width of elytron, ♀, 2.85–3.3 mm.; ♂, 2.25–2.7 mm.

Shape: A small, decidedly hemispherical species.

Color: General color testaceous, greenish at apex of elytron. A broad brown fascia extending from the compound eyes, across the lateral field of the pro- and mesonotum and gradually attenuated along the sutural margins of the elytra. Rest of body and legs testaceous, the legs washed in brownish color and apices of claws black. Compound eyes brown.

Structural Details: Head as viewed from above roundly and only slightly protruding beyond eyes, slightly wider across eyes than pronotum. Vertex slightly depressed, a very faint median carina present, the lateral margins anteriorly strongly diverging. Length of vertex and pronotum on median line equal. Width of eye about one-third the distance between the two eyes. Ocelli bead-like, distinct, located in genal cavity between postclypeus and eye and cephalad of antenna. Antenna typical for genus with ring-like scape, tannish bulbous pedicel, black clavola with small bulbous base, remaining

segments setaceous. Postclypeus slightly tumid, broad, not quite twice as broad as long. Anteclypeus invaginated into postclypeus for approximately one-third length of latter. Labrum small. Pronotum anteriorly produced, posterior margin broadly emarginate, lateral margins subparallel. Mesonotum slightly wider than long, a median carina present. Elytron with length slightly greater than the width, subhemispherical in shape, longitudinal veins very prominent, reticulation only distinct at apex, costal margin broadly expanded. Venation not constant, cubitus in some cases distinctly two-branched, but in the majority simple; vein M_{3+4} very short, branching near original forking of M ; vein M_{1+2} somewhat longer, branching before apical reticulation of the wing. Posterior margin of last complete ventral abdominal segment of the female sinuate, broadly concave on median line until almost touching anterior margin, the lateral angles slightly produced.

Comparative Notes: See under same heading in description of *bivittata*.

Distribution: Metcalf states that the type was taken in Texas and that two paratypes were taken in Arizona. The Kansas biological survey party has collected a large series of sixty or more from Arizona and ten specimens from Zion National Park, Utah.

Acanalonia bivittata (Say).

(Plates I, III and IV.)

Say, Thomas. Jl. Acad. Nat. Sci. Phila., IV, p. 335; Compl. Writ., II, p. 255, *Flata*.

Melichar, L. Ann. k. k. Natl. Hofms. Wien, XVI, p. 183, 1901. *Amphiscepa*.

Metcalf, Z. P. Journ. of the Elisha Mitchell Sci. Soc., XXXVIII, pp. 139-230, 1923. *Acanalonia*.

Dozier, H. L. Miss. Agric. Exp. Sta. Bull. 14, 1926. *Acanalonia*.

DESCRIPTION.

Size: Variable. Length, ♀, 6.1-8.4 mm.; ♂, 5.23-7.35 mm. Width across eyes, 1.63-2 mm. Greatest width of elytron, ♀, 3.6-5.4 mm.; ♂, 3-4.5 mm.

Shape: Elytron typically hemispherical in outline, head truncate in front.

Color: Somewhat variable. Older specimens found in collections testaceous. Many specimens greenish-yellow. Freshly killed specimens light green. Two broad brownish fascia extending from the compound eyes across the lateral field of the thoracic nota and gradually attenuated along the sutural margins of elytra. Clypeus sometimes yellowish-green, frequently washed in dark brown. Eyes reddish, frequently ringed with grayish-white. Ventral portion of body, coxae of anterior and middle legs and all of the hind legs whitish-green, testaceous or yellowish-green. Anterior and middle pairs of legs beyond coxae washed in brown. Tarsal claws black at tips.

Structural Details: Head as viewed from above only slightly protruding beyond eyes, anterior margin slightly rounded. Vertex slightly

depressed through middle, lateral margins slightly elevated. Length of vertex and pronotum on median line subequal. Width of vertex between eyes about three times width of compound eye. Ocelli distinct. Antenna, scape ring-like fitting in raised socket of gena, pedicel bulbous, clavola setaceous with blackish bulb at base. Postclypeus considerably broader than long, lateral margins divergent, then suddenly incurved to meet anteclypeus, some specimens with faint indications of bowed lateral carinae, others ecarinate. Anteclypeus approximately same length on median line as lateral margin of postclypeus, dovetailed into postclypeus for approximately one-third the length of the latter. Labrum small. Pronotum wider than head, lateral margins divergent, anterior margin broadly rounded, posterior margin broadly emarginate. Mesonotum, length and width subequal, ecarinate, two depressed brownish spots on posterior third. Elytron hemispherical, costal margin semicircular and somewhat reflexed at base, broadest just caudad of middle, veins very conspicuous, distinct reticulation throughout the entire elytron. Venation fairly constant, vein M_{3+4} very short, branching just caudad of original forking of M; vein M_{1+2} fairly long, branching before apical reticulation of wing, all four branches of M usually forking at apex although sometimes branches are obscured in this reticulation. Last complete ventral abdominal segment of female with posterior margin sinuate, the median third produced caudad into two elongate processes, the lateral angles also produced, concave between the median and lateral projections.

Comparative Notes: This species is very similar to *fasciata* Metcalf. Metcalf states that the former can be recognized from *bivittata* by its small size, pale legs and different genitalia. When some of the smaller specimens of *bivittata* are compared with *fasciata* the difference in size is not so apparent. Two very good distinguishing characters are the venation of the wings and the last ventral abdominal segments of the females. The latter character can be compared by a glance at the drawings on Plate IV.

In *fasciata* the reticulation on the elytron is confined chiefly to the apex of the wing while in *bivittata* it is just as prominent at the base as at the tip.

Distribution: Dozier lists it from Ontario, New York, New Jersey, Pennsylvania, Washington, D. C., Virginia, North Carolina, Georgia, Florida, Ohio, Wisconsin, Minnesota, Iowa, Kansas, Missouri, Arkansas, Texas, Arizona, Mississippi, and from Mexico. The Kansas biological survey party has collected it from Alabama, South Carolina and Louisiana. H. B. Hungerford has collected it from Michigan.

Host Plants: This species is always taken from sweepings of grasslands.

***Acanalonia bivittata* var. *rubescens* (Melichar).**

Melichar, L. Monographie der Acanaloniiden und Flatiden (Homoptera). Ann. K. K. Naturhistorischen Hof Museums, XVI, p. 183, 1901.

DESCRIPTION.

This variety occurs along with the true species but in very small numbers. In a series of approximately four hundred specimens only seven were fully reddish-brown or pinkish colored, while two specimens showed only traces or a faint pinkish cast. The pink coloring seems to replace the green of the true species, occurring chiefly in the cells of the wings, across the head and thorax and less distinct on the face, especially when the latter is more brown than testaceous or yellow-green. The underpart of body in some cases remained unchanged, while in others a distinct pinkish cast is found on the abdomen and even on the thorax. The legs apparently are the same testaceous and brownish color as is the true *bivittata*. The dark longitudinal stripes are visible and practically of the same extent as for the species.

***Acanalonia conica* (Say).**

(Plates II, III and IV.)

Say, Thomas. Jl. Acad. Nat. Sci. Phila., VI, p. 238, 1930; Compl. Writ., II, p. 373. *Flata*.
 Dozier, H. Miss. Agric. Exp. Sta., A. and M. College, Bull. 14, p. III, 1926.
 Metcalf, Z. P. Journ. of the Elisha Mitchell Sci. Soc., XXXVIII, pp. 139-230, 1923. *Acanalonia*.

DESCRIPTION.

Size: Length, ♀, 10.39-11.64 mm.; ♂, 8.25-9.84 mm. Width across the eyes, 1.65-2.1 mm. Greatest width of elytron, ♀, 5.1-5.8 mm.; ♂, 3.96-5.1 mm.

Shape: A large, trapezoidal species with a distinctly pointed head.

Color: Living specimens and freshly killed specimens are more greenish. Older specimens are testaceous-green or mostly testaceous. Head and thorax testaceous-yellow or yellowish-green, two brownish lateral spots on apex of mesonotum. Eyes reddish. Elytra testaceous, or pale green with a brown inner margin, a somewhat darker brown outer margin with dark brown dashes in the cells just cephalad of margin. Ventral part of body yellowish-white, sometimes washed with green. Legs yellowish or greenish-white, apex of tibia and tarsus washed in brown, tarsal claws dark brown.

Structural Details: Head as viewed from above protruding greatly beyond the eyes, forming a distinct conical angle. Vertex flat without carinae, anterior margin separated from the postclypeus by a sharp carina, lateral margins carinate, slightly diverging anteriorly; on median line somewhat longer than pronotum. Greatest width of eye approximately one-third distance between the eyes. Ocelli large, located in the genal cavity mesad of the eyes and cephalad of the antennae. Antenna typical of the genus with a ring-like scape, bulbous pedicel and setaceous black clavola of which the base also is bulbous. Postclypeus subequal in length and width or somewhat broader than long,

smooth, a median carina which is not always distinct except at apex, lateral margins diverging for half their length, then rounding to meet the anteclypeus, carinate and rather broadly reflexed leaving a distinct groove or hollow on each side between the reflexed portion and tumid central portion. Anteclypeus invaginated into postclypeus not more than one-third the length of the latter. Pronotum collar-like, much longer through middle than at sides, wider than head across the eyes, lateral margins divergent, anterior margin definitely roundly produced, posterior margin broadly emarginate, two small impressions on disc. Mesonotum subequal in length and width, no distinct carinae, two dark lateral spots near apex. Elytron subtrapezoidal in shape with costal and inner margins almost parallel on distal half, the costal margin expanded and only slightly reflexed at base, the longitudinal veins and reticulation prominent, making distinctly depressed cells between. Venation not particularly constant, M always forking into M_{1+2} and M_{3+4} proportionately very near the main trunk of M, R, and Sc; M_{3+4} fairly short, the branches evident before the apical reticulation of the wing; M_{1+2} fairly long, its branches evident before apical reticulation, all four branches again forking at apex or broken up into the apical reticulation. Posterior margin of last complete ventral abdominal segment of female sinuate with the median portion projected caudad as a long, slender flap, the lateral angles also greatly produced caudad, concave between median and lateral projections.

Distribution: Dozier records this species from Virginia, North Carolina, Mississippi, Louisiana, Ohio, Kentucky, Indiana, Illinois, Missouri, Arkansas, Texas and Tennessee. It is commonly taken in Kansas and has been taken by R. H. Beamer in Florida and Georgia and by P. Oman and R. H. Beamer in Alabama. One specimen in the National Museum collection was taken in Maryland.

Hosts: Dozier lists grape, cowpeas and cotton as host plants and states that Swezy lists osage orange, lilac, corn, ragweed, catnip, milkweed and sugar beet as food plants. One specimen collected by F. C. Bishopp in Texas was taken on *Solanum rostratum* and specimens collected by R. A. Cushman in Louisiana were taken on tiger lily.

***Acanalonia clypeata* Van Duzee.**

(Plates II, III and IV.)

Van Duzee, E. P. Proc. Acad. Nat. Sci. Phila., LIX, p. 496, 1908.

DESCRIPTION.

Size: Length, ♀, 7.8 mm.; ♂, 6.66–7.35 mm. Width across eyes, 1.65–1.8 mm. Greatest width of elytron, ♀, 3.36 mm., ♂, 2.75 mm.

Shape: An elongate, subparallel species, with elytra narrowed somewhat at apex, but the inner and costal margin more subparallel than in *mollicula*; a slightly conical head.

Color: General color pale greenish-yellow or greenish-white. Head and thorax pale yellowish-green. Elytra pale green, becoming whitish along base of costa, the outer margin sometimes brown with brown dashes cephalad to it in the cells. Tarsi washed in brown, apical spines of posterior tibiae and tarsi black.

Structural Details: Head as viewed from above produced anteriorly into a conical angle, not so much as in *conica*, but slightly more than in *virescens*. Vertex slightly depressed across middle, ecarinate, lateral angles anteriorly divergent, its length on median line slightly greater than that of pronotum. Width of eye a trifle less than half the distance between the eyes. Ocelli conspicuous. Antenna typical for the genus, situated in a cup-like elevation on the gena, the scape ring-like, the pedicel bulbous and the clavola black in color, bulbous at base, rest setaceous. Postclypeus broad, about one-third wider than greatest length, base tumid, posterior margin truncate, lateral margins subparallel posteriorly, rounded just anterior to middle, then convergent to meet anteclypeus. Anteclypeus large, tumid, its broad, truncate base dovetailed into postclypeus for at least half the length of the latter and to a point above the ventral line of the eyes. Labrum small. Pronotum slightly wider than head, ecarinate, anterior margin broadly rounded, lateral margins divergent, posterior margin broadly emarginate. Mesonotum, width somewhat greater than length, ecarinate. Elytron, long and narrow, its length twice its greatest width which is about the basal fourth, after which point it becomes narrowed, with costal and inner margins subparallel to the weakly convex apex, costal margin expanded and reflexed; longitudinal veins very distinct, the reticulation evident over entire surface but weaker at the base, less prominent than in other species. Venation, M_{3+4} very short, branched near original forking of M ; veins M_3 and M_4 again branched near apex of wing; vein M_{1+2} long, not branched before apical reticulation. Wings as long as elytra, whitish, hyaline or somewhat infuscated. Last complete ventral abdominal segment of the female with posterior margin sinuate, slightly concave on mesal line, then somewhat rounded, again concave, finally forming sharply caudad-projecting lateral angles.

Comparative Notes: Similar to *virescens* because of conical head and size but easily separated by the narrow wings and large anteclypeus. Similar to *grandicella* in coloring, general appearance and large anteclypeus. It is easily separated from *grandicella* by the narrow elytra which are broader anteriorly while in the latter they are broader near the apex, by its more conical head, by its lack of carinae on mesonotum and also between the postclypeus and vertex and by being less depressed across vertex. Similar to *mollicula* also with which it is compared under this heading in the description of *mollicula*.

Distribution: Van Duzee lists it from Utah and Nevada. In the Snow collection are three specimens collected by R. H. Beamer in California and one specimen by F. H. Snow from

Arizona. Five specimens in the National Museum collection were taken in Arizona.

Hosts: David Fox took one specimen at St. George, Utah, on *Salsola pestifer*.

***Acanalonia grandicella* n. sp.**

(Plates II, III and IV.)

DESCRIPTION.

Size: Length, ♀, 8.4-9 mm.; ♂, 7.35 mm. Width across eyes, 2.1 mm. Greatest width of elytron, ♀, 4.8-5 mm., ♂, 3.6 mm.

Shape: An elongate, subquadrangular species with elytra narrow and subparallel.

Color: A very pale whitish-green species. Eyes red. Legs and under part of body pale yellowish-green. Tips of tibial and tarsal spines blackish-brown. Apex of elytron with dark brown dashes just anterior to apical margin.

Structural Details: Head as viewed from above somewhat roundly protruded anteriorly beyond eyes. Vertex distinctly depressed transversely, a fairly distinct carina separating vertex from postclypeus, length of vertex and pronotum on median line equal. Width of eye slightly less than half the width of vertex between the eyes. Ocelli readily distinguishable in the cavity between the postgenae and eyes and anterior to the antennae. Scape of antenna short, ring-like, pedicel bulbous, clavola black with base bulbous and rest setaceous. Postclypeus much broader than wide; length on median line less than half the length at the sides due to the deep invagination of the anteclypeus. Anteclypeus tumid, very long, over twice length of postclypeus on median line, broadly truncate at base, ecarinate. Labrum small. Pronotum somewhat wider than head, hind margin slightly angularly emarginate. Mesonotum as broad as pronotum, quite long, with traces of three carinae, the lateral ones more prominent than the median. Elytron long, narrow, subparallel, semitransparent, the longitudinal veins very conspicuous, the intervening network less abundant and very faint, making larger cells than in most species. Costal margin of elytron only moderately expanded. Venation, M_{3+4} short, branched, very near the original forking of M; vein M_{3+4} long, not branched before apical reticulated area. Posterior margin of last complete ventral abdominal segment of the female sinuate, produced caudad on median line and also laterally, the lateral angles rounded, concave between median and lateral projections.

Comparative Notes: See under same heading in the description of *A. clypeata*.

Before describing this species as new the writer sent a female and male example to Mr. China of the British Museum, to compare with the type of Fowler's *delicatula*. These specimens seemed to answer fairly well to the written description of the latter. Mr. China reported that this species was not *delicatula*.

He pointed out that the vertex is much narrower and subconical at apex and that the postclypeus is much longer and narrower in *delicatula*. On Plate III are two sketches of Mr. China's which the writer has taken the liberty of copying.

Types: Holotype female, Holtville, California, collected by R. H. Beamer; allotype male, Maricopa Co., Arizona, by R. H. Beamer; two paratype females and one male paratype from Arizona, all in the Snow collection, University of Kansas. Two paratype females in the National Museum, collected from Arizona.

Acanalonia mollicula Van Duzee.

(Plates II, III and IV.)

Van Duzee, E. P. A Preliminary List of the Hemiptera of San Diego Co., Cal. Trans. of San Diego Soc. of Nat. Hist., Vol. 2 (I), p. 42, 1914.

DESCRIPTION.

Size: Length, ♀, 5.5-5.78 mm.; ♂, 5.4 mm. Width across eyes, 2.1 mm. Greatest width of elytron, ♀, 2.4-2.7 mm.; ♂, 2.4 mm.

Shape: A small, slender species with elytra distinctly narrowed at apex, costal margin rounding and head slightly conical.

Color: General color greenish-testaceous with a brownish caste, perhaps more green in life. Head and thorax testaceous or greenish-yellow with a smoky tinge. Elytra uniformly testaceous or greenish except for a narrow brown band on inner margin between the claval veins and the margin itself, also the outer margin faintly brown preceded anteriorly with small faint dashes in the cells. Eyes darkly mottled. Clypeus and ventral part of body dusky-testaceous, anteclypeus sometimes fuscous. Pedicel of antenna fuscous. Legs mottled or washed with fuscous, the tibiae darkest of all.

Structural Details: Head as viewed from above produced anteriorly into a conical angle, but not as much as in *clypeata*. Vertex ecarinate, lateral angles anteriorly divergent, its length on median line slightly greater than pronotum. Width of eyes approximately one-third the distance between the two eyes. Ocelli conspicuous. Antennae typical for the genus, situated in a cup-like elevation on the gena, the scape ring-like, the pedicel bulbous and the clavola black in color, bulbous at base and rest setaceous. Postclypeus with width only slightly greater than greatest length, base tumid, lateral margins subparallel for over half their length then converging to meet margin of anteclypeus. Anteclypeus only slightly tumid, dovetailed into postclypeus for less than half the total length of latter. Labrum small. Pronotum as wide or only slightly wider than head, ecarinate, lateral margins divergent, anterior margin broadly rounded, posterior margin shallowly emarginate. Mesonotum with two lateral carinae, its width somewhat greater than its length. Elytron long and narrow, its length approximately twice its greatest width which is about at a point halfway from base to tip, costal margin sharply reflexed and strongly rounded,

narrowing sharply to the narrow apex, the longitudinal veins very distinct, the reticulation lacking at base but distinct at apical region. Venation, M_{3+4} very short, branched near original forking of M ; vein M_{1+2} long, not branched before apical reticulated area. Wings white with brown veins, as long as elytra. Last complete ventral abdominal segment of female broadly rounded posteriorly, posterior margin not sinuate as in other species, across middle of the segment two converging carinae with concavity between.

Comparative Notes: *A. mollicula* resembles *A. clypeata* very much, but differs by having the costal margin greatly rounded instead of straight as in *clypeata* and the elytra narrowed apically to a greater extent than in *clypeata*. *Mollicula* also has a much smaller and less tumid anteclypeus than *clypeata*. Lastly, the female abdominal segments differ as is shown in figures on Plate IV.

Distribution: Recorded only from California.

***Acanalonia virescens* Stal.**

(Plates II, III and IV.)

Stal, Carolus. Stett. ent. Zeit., XXV, p. 56, 1864.

Fowler, W. W. Biol. Central Am. Homoptera, I, p. 49, 1900.

Melichar, L. Anns. des K. K. Naturhistorischen Hofmuseums, Wien, p. 185, 1902.

Metcalf, Z. P. Journ. Elisha Mitchell Sci. Soc., XXXVIII, p. 139, 1923.

DESCRIPTION.

Size: Length, ♀, 6.3–6.9 mm.; ♂, 5.5–6.3 mm. Width across eyes, 1.7–2 mm. Greatest width of elytron, ♀, 3.9–4.2 mm.; ♂, 3.3–3.79 mm.

Shape: A medium-sized species with wings subhemispherical.

Color: Mostly a testaceous species. In some cases the basal half testaceous and the apex greenish-tan. The veins and expanded costal margin pale yellow. Apical margin and inner margin of clavus with brownish bands. Apex of tibia and tarsal segments and sometimes anteclypeus washed in brown, tarsal claws black. Ventral segments yellowish-tan, sometimes ovipositor washed in brown.

Structural Details: Head as viewed from above slightly protruding anteriorly before eyes, slightly conical as seen from a lateral view. Vertex flat; a fairly distinct carina between vertex and postclypeus; length on middle slightly longer than pronotum. Width of eye about one-third width of vertex. Ocelli small but distinct, located in the genal pocket cephalad of antenna. Scape of antenna ringlike, inconspicuous, pedicel bulbous, clavola black, bulbous at base, rest setaceous. Postclypeus very broad, width twice its length on median line, lateral margins parallel posteriorly for two-thirds their length, then abruptly curving mesad, posterior margin very slightly rounded beyond eyes. Anteclypeus, length on median line subequal to lateral margin of postclypeus, dovetailed into postclypeus for more than one-third the length

of the latter. Pronotum, anterior margin rounded, posterior margin slightly emarginate, lateral margins divergent, greatest width somewhat greater than width of the head. Mesonotum somewhat wider than long. Elytron approximately only one-third longer than greatest width, sub-hemispherical in shape, longitudinal veins distinct, network of cross-veins, making small distinct cells between them. Costal margin of elytron broadly expanded and reflexed. Venation, M_{3+4} in some cases short, branching close to original forking, in others long, branching nearer apex of wing; vein M_{1+2} long, not branched before apical reticulate area. Wings long and milk-white. Posterior margin of last complete ventral abdominal segment of female sinuate, produced caudad on median line into a distinct rounded flap and also laterally, the lateral angles truncate, concave between median and lateral projections.

Comparative Notes: See same heading in the description of *clypeata*.

Distribution: Melichar gives Central America and Mexico as the localities for this species. Fowler lists Mexico, Yucatan, Guatemala and Panama. Metcalf (1923) lists it for the first time from the United States. A series of twenty-three specimens in the Snow insect collection was taken from Brownsville, Texas, by F. H. Snow and from Cameron and Hidalgo counties, Texas, by R. H. Beamer.

Note: Melichar describes this species as being green. In the 23 specimens before the writer none of them were entirely green. Apparently the species fades quickly after being killed and is much greener in life.

Acanalonia immaculata Kirk.

(Plates I, III and IV.)

Kirkaldy. Haw. S. P. A. Exp. Sta. Bull. IV, p. 65, 1907; XII, p. 19, 1913.

DESCRIPTION.

Size: Length, ♀, 7.2 mm.; ♂, 6.3 mm. Width across eyes, 1.9–2.1 mm. Greatest width of elytron, ♀, 4.56 mm.; ♂, 3.9 mm.

Shape: A medium wedge-shaped species with greatest width of elytron at the apical end. Head blunt.

Color: General color varying from light green to testaceous. Head and thorax greenish or testaceous. Elytra light green or partially testaceous. Anal vein frequently reddish-brown. Outer margin reddish-brown. Clypeus, labrum, and ventral portion of body light green or testaceous. Legs pale greenish and testaceous, tarsi darker testaceous. Posterior tibial and tarsal claws black. Eyes reddish.

Structural Details: Head as viewed from above protruding beyond eyes and distinctly rounded in front. Vertex somewhat depressed, lateral margins diverging slightly, meeting the anterior margin at a

sharp, cephalad-projecting angle. Vertex considerably longer than pronotum on median line. Width of eye somewhat more than a third of the distance between the eyes. Ocelli small, bead-like. Antenna typical for the genus, situated in the genal pocket, scape ring-like, pedicel bulbous, clavola with bulbous base and seta black. Postclypeus flatly and gradually fused with vertex so that posterior margin of the latter is visible from a cephalic view of the head, ecarinate, the lateral margins subparallel, distinctly carinate and slightly recurved on each anterior half. Anteclypeus broad, tumid, dovetailed into postclypeus for only one-fourth of its length. Labrum slender, about one-third the length of the anteclypeus. Pronotum collar-like, twice as long on median line as at the sides, about as wide as head, lateral margins very little divergent, posterior margin broadly excavate. Mesonotum ecarinate, length and width subequal. Elytron, length one-fifth greater than its greatest width which is across the extreme apex of the wing and from which the costal margin gradually slopes towards its base, where it is somewhat expanded and reflexed, the longitudinal and cross-veins very heavy. Venation, M_{3+4} short, branched near original forking of M ; M_4 branched again near apex of wing; M_{1+2} apparently simple. Posterior margin of last complete ventral abdominal segment of the female concave across middle third, slightly evaginated on median line and again laterad of central concavity, rounding into a caudad-projecting lobe from whence it gradually curves cephalad to the lateral margin.

Distribution: Van Duzee's catalogue lists this from Arizona and Mexico.

Acanalonia invenusta n. sp.

(Plates II, III and IV.)

DESCRIPTION.

Size: Length, ♀, 5.1–5.6 mm.; ♂, 4.26–4.56 mm. Width across eyes, 1.44–1.68 mm. Greatest width of elytron, ♀, 3.24–3.9 mm.; ♂, 2.7–3 mm.

Shape: A small, hemispherical species with short, blunt head.

Color: Perhaps green in life but specimens in collections rather uniformly testaceous. Head and thorax light yellow or testaceous. Elytra testaceous or light greenish-yellow except for whitish costal margin, the claval vein and sometimes the outer margin which is dark brown. Postclypeus testaceous or yellowish-white. Anteclypeus brownish-testaceous or yellow, marked sometimes with darker converging diagonal lines. Legs washed in light brown, posterior tibial and tarsal claws black.

Structural Details: Head as viewed from above distinctly protruding beyond eyes, truncate, anterior margin sinuate, slightly rounding across middle, then concave and again produced cephalad at the sides into sharp lateral angles. Vertex slightly longer than pronotum, somewhat depressed across disc, lateral margins anteriorly divergent. Width of eye about one-half width of distance between the eyes. Ocelli

small, not easily discernible. Antenna situated in a deep, genal pocket, the scape a narrow ring, pedicel large, bulbous, the clavola black and with a bulbous base. Postclypeus gradually fused with vertex so that from a true cephalic view of the face the posterior margin of vertex is visible, broadest just anterior of middle where the lateral margins are expanded and sharply carinate, from which point they converge to meet the anteclypeus. Anteclypeus tumid, truncate at base where it indistinguishably fuses with postclypeus across the middle, dovetailed into the postclypeus for approximately one-third or less of the latter's length. Labrum small. Pronotum collar-like, twice as long through middle as at the sides, wider than head, lateral margins divergent, posterior margin shallowly concave. Mesonotum somewhat wider than long, ecarinate. Elytron, width approximately two-thirds its length, costal margin strongly rounded, outer margin weakly convex, longitudinal veins very distinct, reticulation much fainter, scarcely visible on basal and costal areas. Venation variable, M_{3+4} and M_{1+2} short, branching near the original forking of M , M_{3+4} very frequently taking on a pectinate appearance. Wings vestigial, not visible by external examination. Last complete ventral abdominal segment of female deeply excavated at posterior margin, at the apex of this indentation is a caudal projection which is itself indented, the space between the indented sides and the caudal projection narrower than the width of the projection.

Types: Holotype female and allotype male taken in Chaves County, New Mexico, collected by R. H. Beamer, and twenty-two paratypes collected by P. A. Readio and R. H. Beamer from Chaves County and Roosevelt County, New Mexico. Three paratypes from the National Museum collection taken in Brewster County, Texas.

Comparative Notes: See under same heading in the description of *A. similis*.

***Acanalonia similis* n. sp.**

(Plates II, III and IV.)

DESCRIPTION.

Size: Length, ♀, 4.95 mm.; ♂, 4.2-4.44 mm. Width across eyes, 1.5 mm. Greatest width of elytron, ♀, 3 mm.; ♂, 2.85-3 mm.

Shape: A small, subelongate species with greatest width of elytron at apex of basal half and with inner margin, especially of the males, suddenly sloping into the outer margin, making the apex look much narrowed.

Color: General color light testaceous. Head and thorax yellowish-testaceous. Elytron testaceous except for whitish expanded costal margin and the anal vein and outer margin which are faintly brownish. Eyes golden-brown. Face yellowish-testaceous except for reddish-brown converging diagonal streaks on anteclypeus. Ventral segments

of body and coxae cream-white, rest of leg segments testaceous, tarsi dark testaceous. Tips of posterior tibial and tarsal claws black.

Structural Details: Head as viewed from above distinctly protruding beyond eyes, slightly rounded anteriorly and with laterocephalic angles very sharp. Vertex of head longer than pronotum, depressed across disc, lateral margins diverging anteriorly. Width of eye somewhat greater than one-third width of vertex between the eyes. Ocelli small and indistinct. Antenna situated in genal pocket between overlapping carinate margin of postclypeus, typical for genus with ring-like scape, bulbous pedicel and black clavola which is bulbous at base, then becoming setaceous. Postclypeus so gradually fused with vertex that from a true cephalic view of face the posterior margin of the vertex is visible, broadest just anterior to middle, lateral margins converging cephalad to meet the anteclypeus. Anteclypeus tumid, truncate at base where it indistinguishably fuses across the middle with the postclypeus and into which it is projected for approximately one-third the length of the latter. Labrum small. Pronotum collar-like, greatly extended at sides around eyes, anterior margin strongly rounded, about three times as long on median line as behind eyes, lateral margins divergent, posterior margin almost straight across. Mesonotum a trifle wider than long, two lateral carinae visible, somewhat sunken between, sometimes a faint median carina also present. Elytron somewhat longer than wide, greatest width at apex of basal half, costal margin hemispherical, suddenly sloping to outer margin, making apex of elytron, especially in the males, considerably narrowed. Longitudinal veins and apical reticulation raised and prominent, the reticulation visible but not so heavy at base. Venation, M_{3+4} fairly long, branched just before apical reticulation; M_{1+2} very short, branched very near original forking of M, each resulting branch forked again before apical reticulated area. Wings vestigial. Last complete ventral abdominal segment of female deeply indented on posterior margin, at the apex of this indentation a long, slender caudad projection which is itself slightly indented, the space between the indented sides and caudal projection broader than the projection itself.

Comparative Notes: Very similar to *invenusta* in size, coloring and structure, but distinguished from it by the heavier reticulation, narrow apices of elytra and the ventral segment of the female as seen in the drawings on Plate IV.

Types: Holotype, female, from El Paso Co., Texas, collected by R. H. Beamer. Allotype, male, collected by R. H. Beamer from Chaves Co., New Mexico. Three paratype males from El Paso Co., Texas, and one from Presidio Co., Texas, all collected by R. H. Beamer. All types in the Snow collection, University of Kansas.

Distribution: Texas and New Mexico.

Acanalonia pumila (Van Duzee).

(Plates I, III and IV.)

Van Duzee, E. P. Studies in North American Fulgoridae. Proc. Acad. Nat. Sci. Phila., LIX, p. 495, 1908. (*Amphiscepa*.)

DESCRIPTION.

Size: Length, ♀, 4.2-4.44 mm.; ♂, 3.36-3.9 mm. Width across eyes, 1.2-1.44 mm. Greatest width of elytron, ♀, 2.4-2.7 mm. ♂, 2.1-2.4 mm.

Shape: Form of some of the Issinae genus such as *Hysteropterum*. A blunt, somewhat hemispherical species.

Color: General color light green or greenish-testaceous. Head, thorax and elytra of some specimens an even green except for the outer margin and apical dashes in the cells which are brown; legs of these specimens greenish with pale coxae, the tarsi fuscous and the spines on posterior tibiae and tarsi black. Some specimens with head, thorax and ventral parts of body testaceous, while the elytra are more testaceous-green. Eyes reddish or reddish-brown.

Structural Details: Head only slightly rounded before eyes as viewed from above. Vertex ecarinate, smoothly rounding to meet the postclypeus with no visible carinae between them, lateral margins divergent, the laterocephalic angles not sharp as in other species. Vertex and pronotum equal on median line. Width of eye almost one-half width of vertex between the eyes. Ocelli small, protruding. Antenna typical for the genus. Postclypeus, width somewhat greater than length, greatest width at about the insertion of the antennae from whence the lateral margins abruptly incurve to meet the anteclypeus. Anteclypeus short, only about two-thirds length of postclypeus on median line, weakly tumid, dovetailed into postclypeus not over one-third length of latter, the suture between the two obsolete through middle. Labrum small. Pronotum very short behind the eyes, length of median line much greater, equal in width to head across the eyes, anterior margin strongly rounded, posterior margin only very slightly concave. Mesonotum subequal in length and width. Elytron somewhat longer than broad, inner and costal margins subparallel, apex weakly convex, costal region at base not greatly expanded, somewhat reflexed, reticulation very heavy and elevated so that the longitudinal veins stand out less prominently than other members in the genus. Venation, branching of M obscured in the reticulation of the wing, although usually one is able to distinguish M_{1+2} and M_{3+4} with the latter branched again near the original forking of M. Wings white, short, closely appressed to body so not easily visible externally. Posterior margin of last complete ventral abdominal segment of the female sinuate, slightly protruding caudad on mesal line into a small rounded lobe, concave either side of it, again broadly bulging, then concave and finally forming caudad-projecting lateral angles.

Distribution: Van Duzee's catalogue (1919) lists Florida. Dozier (1926) adds North Carolina and states that this species seems limited in distribution to the seashore.

Hosts: Dozier reports that Van Duzee swept a good series from a peculiar succulent plant growing along the seashore in Florida and that Metcalf and Osborn took this species from beach grass about the level of high tide in North Carolina. R. H. Beamer has taken a series from Key Largo and Likley, Florida.

***Acanalonia laticosta* n. sp.**

(Plates II, III and IV.)

DESCRIPTION.

Size: Length, ♀, 4.39–5.4 mm.; ♂, 3.6–4 mm. Width across eyes, 1.39–1.8 mm. Greatest width of elytron, ♀, 3.15–3.84 mm.; ♂, 2.46–3 mm.

Shape: A fairly small, almost square species with a blunt, short head and a broad, expanded costal margin.

Color: General color of museum specimens testaceous with touches of green on elytra. Head, thorax and elytra uniformly testaceous, except for a faint indication of green on veins in apical part of elytron, the whitish costal margin and the faint brownish outer margin. Eyes reddish or reddish-brown. Face and ventral parts of body testaceous, anteclypeus, coxae and tarsi of legs and ovipositor washed in dark brown; tip of posterior tibial and tarsal claws black.

Structural Details: Head very short, as viewed from above, scarcely protruding at all beyond eyes. Vertex shortest through middle, a distinct carina separating it from postclypeus as visible from above, lateral margin of vertex equal to length of pronotum on median line. Eye less than one-third the width of vertex between the eyes. Ocelli apparently lacking. Antenna small, scape ring-like, pedicel bulbous, clavola black with bulbous base and rest setaceous. Postclypeus, one-fourth broader than long, posterior margin rounding, lateral margins decidedly carinate, forming an overhanging ledge so that antennae are scarcely visible from a cephalic view, subparallel for two-thirds their length, then abruptly incurved cephalad to meet anteclypeus, a distinct median carina visible and sometimes two distinct lateral ones running parallel to it. Anteclypeus somewhat short, its length about equal to length of postclypeus on median line, its anterior margin projected into postclypeus for about one-third the length of the latter, slightly tumid. Labrum slender, its length about one-third as long as the clypeus. Pronotum collar-like, encircling the eyes for a considerable distance; approximately twice as long on median line as directly caudad of eye, anterior margin broadly rounded, lateral margins greatly divergent, posterior margin almost straight, two small, round depressions on disc. Mesonotum broader than long, tricarinate. Elytron semitransparent, slightly longer than broad, broadest across base of apical third, costal margin distinctly hemispherical, very broadened and expanded at base, only slightly reflexed, outer margin more strongly convex than in other species, longitudinal veins distinct, reticulation indistinct in costal and radial region. Venation, M_{1+2} and M_{3+4} short, branching near original

forking of M , M_4 again branched before being lost in apical reticulation. Wings vestigial. Posterior margin of last complete ventral abdominal segment of female sinuate, prolonged caudad on median line into a slender, pointed flap, deeply concave on each side of flap, then almost straight to lateral margin of the segment.

Types: Holotype, female, Karnes County, Texas, collected by R. H. Beamer. Allotype, male, collected by J. D. Mitchell from Olivia, Texas. One paratype collected from Karnes County, Texas, which with the holotype is in the Snow collection at the University of Kansas. A large series of paratypes, all from Texas, in the National Museum.

Comparative Notes: See under this heading in the description of *parva*.

Distribution: All specimens at hand were from Texas.

Hosts: They have been collected from the following plants by the following collectors: J. D. Mitchell, on *Helenium* sp., *Croton* sp., and *Anthemis arvensis*; R. A. Cushman, on *Chrysopsis* sp.; W. D. Pierce, on *Siderocarpus flexicaula*.

Acanalonia parva n. sp.

(Plates II, III and IV.)

DESCRIPTION.

Size: Length, ♀, 4.35 mm.; ♂, 3.6–4.2 mm. Width across eyes, 1.38–1.5 mm. Greatest width of elytron, ♀, 2.88 mm.; ♂, 2.52–2.94 mm.

Shape: An exceedingly small oval species, about the size of *pumila*.

Color: General color evenly testaceous, perhaps somewhat green in life. Elytra uniformly testaceous except for reddish-brown outer margin. Eyes brownish or reddish-brown. Clypeus testaceous with converging diagonal brown bands on anteclypeus. Ventral segments of body golden-testaceous. Legs pale testaceous except tarsi which are more brownish. Tips of posterior tibial and tarsal claws black.

Structural Details: Head as viewed from above very little protruded beyond eyes, slightly rounded anteriorly, length on mesal line equal to pronotum. A distinct carina apparently separating vertex from postclypeus, thus making vertex very short, its greatest length thus being on the sides. Width of eye somewhat over one-third of vertex between the eyes. Ocelli apparently lacking. Scape of antenna ring-like, pedicel bulbous but small, deeply placed in genal pocket formed by the overlapping margin of postclypeus, clavola black, bulbous at base, rest setaceous. Postclypeus slightly wider than long, lateral margins subparallel for two-thirds their length, then gradually incurved to meet anteclypeus, very little reflexed, a distinct median carina visible. Anteclypeus equal in length and width, its anterior margin projected into postclypeus for approximately one-third the length of the latter. Labrum slender, approximately one-half length

of anteclypeus. Pronotum collar-like, greatly encircling eyes, lateral margins greatly diverging, anterior margin broadly rounded, posterior margin slightly emarginate. Mesonotum somewhat wider than long, three carinae visible, two roundish spots near apex. Elytron, length about one-fourth greater than width, outline oval, outer margin strongly convex, costal margin hemispherical, base very broadly expanded as in *laticosta*, longitudinal veins distinct at base but lost in the apical reticulated area where the veins are thickened and numerous. Venation, M_{1+2} and M_{3+4} short, both branching near original branching of M, the resulting branches lost in the reticulation. Posterior margin of last complete ventral abdominal segment of female concave in middle, then transversely straight until it reaches the lateral margin where it bends somewhat cephalad.

Types: Holotype, female, Starr County, Texas, collected by R. H. Beamer in July. Allotype, male, Starr County, Texas, collected by R. H. Beamer in July. Ten paratypes taken from Hidalgo, Victoria, Starr and Aranos counties, Texas, by R. H. Beamer and A. M. James in July and August. The types are in the Snow collection, University of Kansas.

Comparative Notes: Very similar in structure and appearance to *laticosta*, but differs by its much smaller size and difference of the last complete ventral segment in the female as shown on Plate IV. About the size of *pumila*, but easily distinguished by the oval shape, broader wings and broad expanded costal margin.

Distribution: Texas.

***Acanalonia concinnula* Fowler.**

(Plates II, III and IV.)

Fowler, W. W. Biol. Centr. Am. Homop., I, p. 49, 1900.

Distribution: Van Duzee's catalogue lists it from Texas and Mexico. Metcalf placed it in his key to the Fulgoridae of Eastern North America. The writer has not been able to study this species.

Comparative Notes: A series of specimens in the Snow collection which at first were taken for this species has been described as a new species, *Acanalonia invenusta*. This was done after Mr. China, of the British Museum, very kindly compared specimens with Fowler's types. Specimens of *laticosta* n. sp. and *invenusta* n. sp. were sent to him. He has this to say concerning his observations:

"I have examined the type of *Acanalonia concinnula* Fowler. It is in very bad condition and it is difficult to make out the characters, but there is no doubt

that it is quite different from either of the two species you have sent. It is a much smaller species, bright green with the whole claval commissure reddish-brown. In general appearance it is entirely distinct from your specimens. Although agreeing in most points with No. II (*invenusta*), it differs in the much shorter frons without a median longitudinal carina and in the shape of the last ventral abdominal segment in the female. The tegmina are much less convex. I inclose rough figures."

Copies of Mr. China's sketches are shown on Plates III and IV.

The ventral abdominal segment of the female, the brown bands on elytra and shape of the elytra indicate the possibility that Metcalf's *fasciata* might be Fowler's *concinna*. At least the two must be very similar. Neither Mr. Fowler or Mr. China mentioned the presence of brown stripes on head and thorax which are continuous with those of the elytra in *fasciata*. Further checking in regard to this and other points would be necessary before throwing *fasciata* into synonymy.

EXPLANATION OF PLATES.

PLATES I AND II.

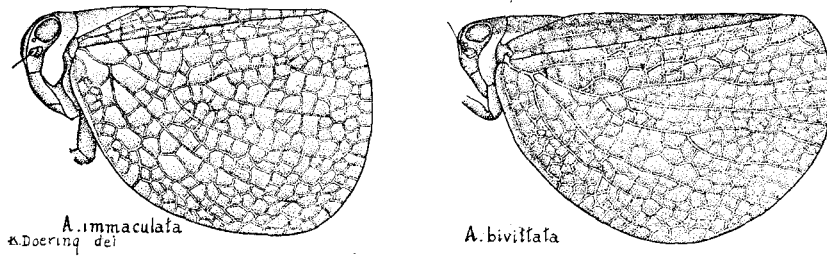
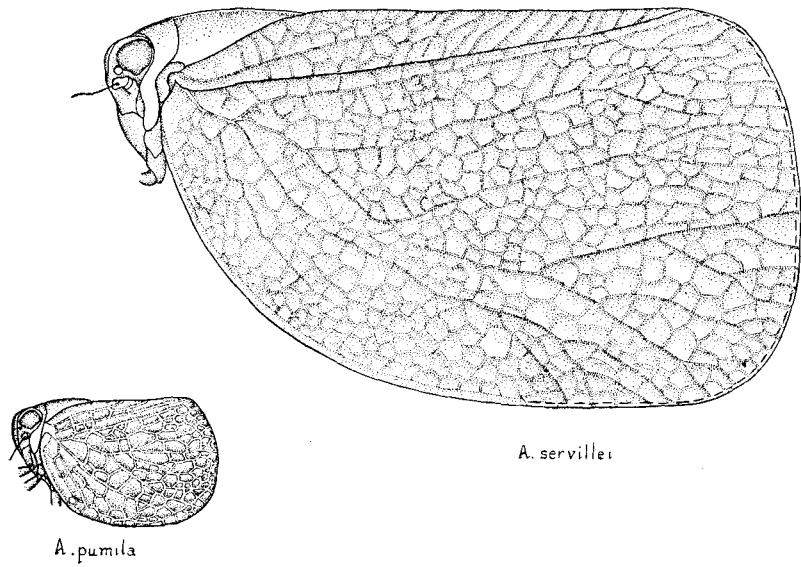
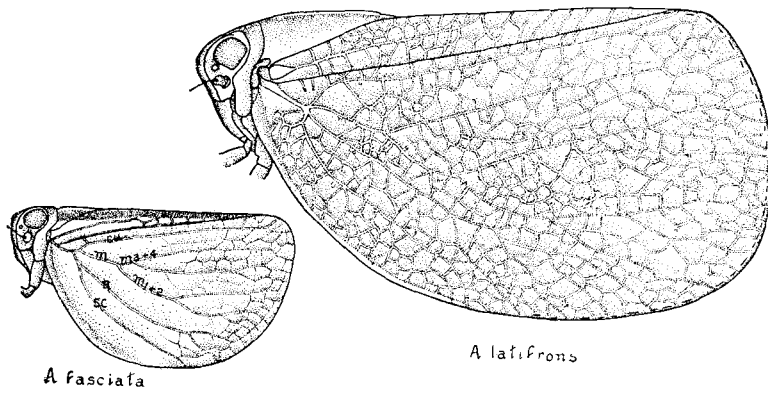
Lateral views of species of *Acanalonia*.

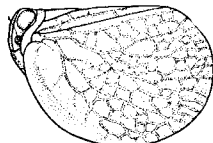
PLATE III.

Front view of head and a dorsal view of head and thorax for each species.

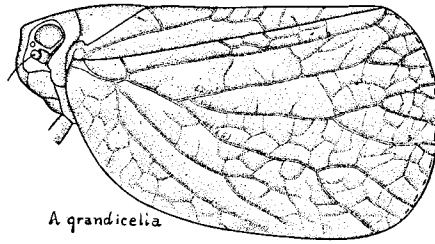
PLATE IV.

Ventral views of the genitalia of females of *Acanalonia*.

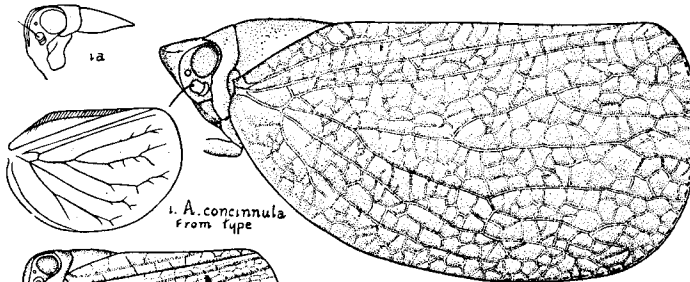




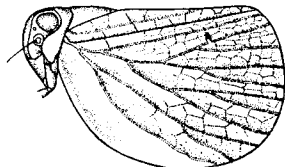
A. parva



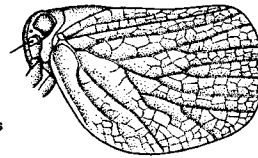
A. grandicella



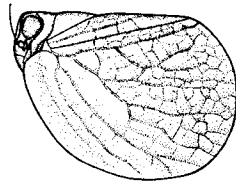
A. conica



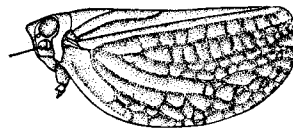
A. invenusta



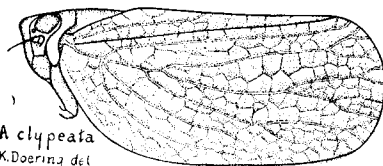
A. similis



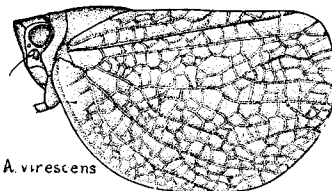
A. laticosta



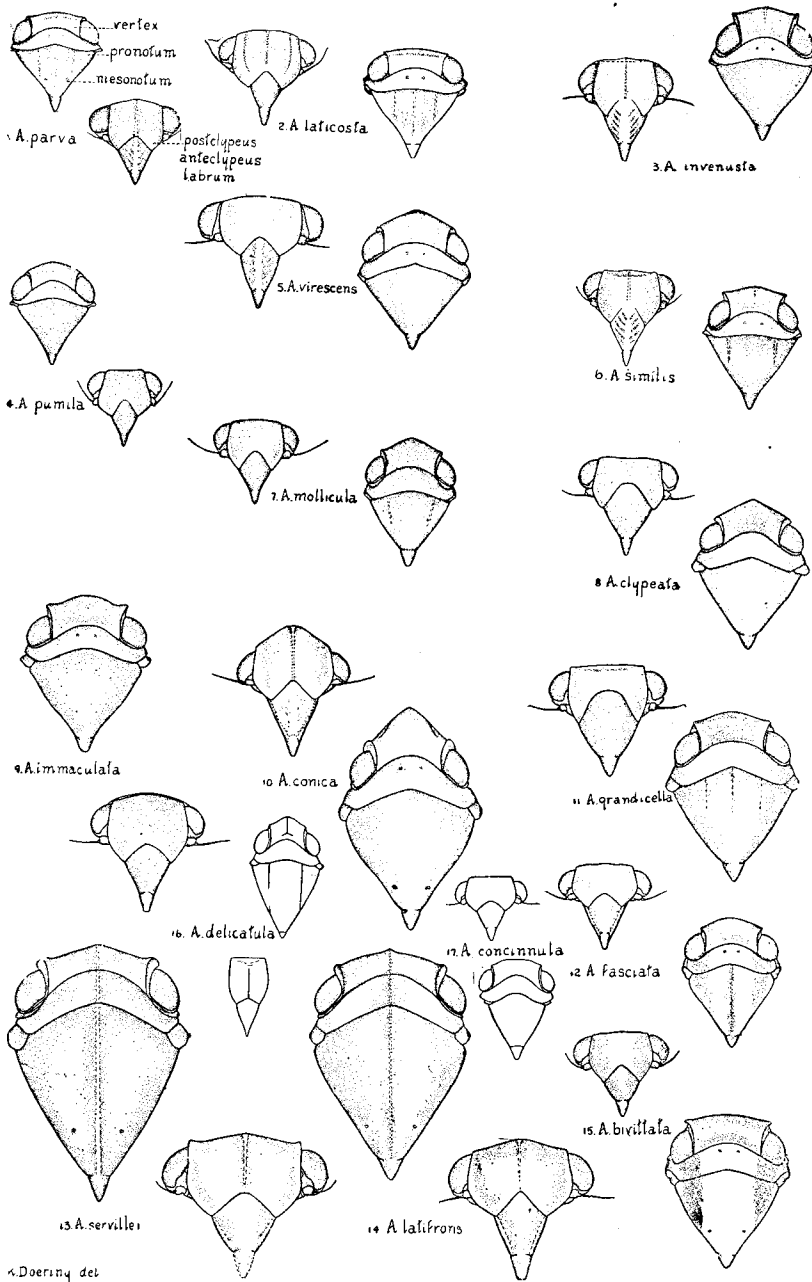
A. mollicuta

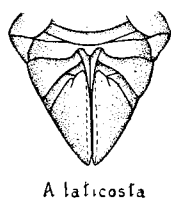


A. clypeata
K. Doering del

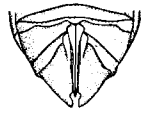


A. virescens

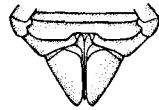




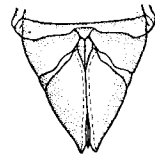
A. laeticosa



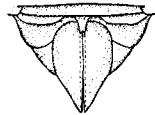
A. pumila



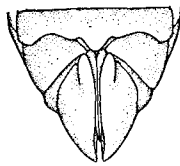
A. parva



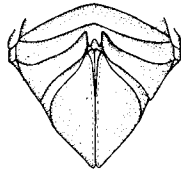
A. fasciata



A. similis



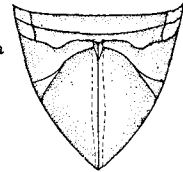
A. virescens



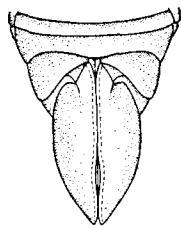
A. invenusta



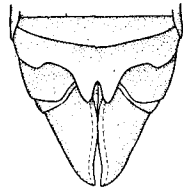
A. concinnula



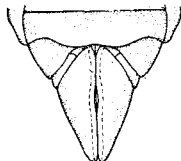
A. immaculata



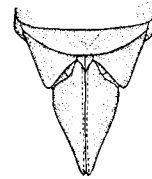
A. grandicella



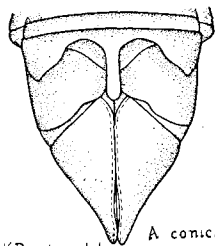
A. bivittata



A. clypeata

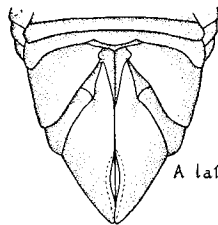


A. mollicula

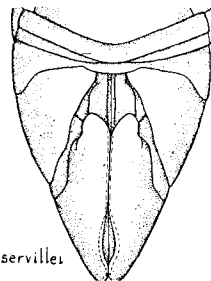


K. Doering del.

A. conica



A. latifrons



A. servillei