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**Studies of the Neotropical Mileewaninae
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ABSTRACT

Nine new species of the genus *Amahuaka* Mel. from Mexico are described: *A. variabilis* n.sp., *A. bicornis* n.sp., *A. atrifrons* n.sp., *A. monoceros* n.sp., *A. pungens* n.sp., *A. jocosa* n.sp., *A. spinigera* n.sp., *A. scutellaris* n.sp. and *A. vermiculata* n.sp. The male genitalia of the generotype, *A. angustula* (Fowl.) are illustrated for the first time.

The main range of the leafhopper subfamily Mileewaninae lies within the Ethiopian and Oriental regions. Tropical Africa, especially, is rich in species (a revision of the African species by Linnavuori is in press). YOUNG (1965) proving that the genus *Amahuaka* Mel., formerly regarded as a representative of the Cicadellinae, actually belongs to the Mileewaninae, was the first, who reported the occurrence of the group in the Western Hemisphere. In his paper seven species were recorded from Mexico, one from Costa Rica and one from Peru. A study of Mexican material in the DeLong collection revealed nine additional species that are described below. The Mileewaninae are apparently far more abundant in the New World than previously assumed.

Amahuaka is very closely related to the Old World genus *Mileewa* Dist. (syn. *Augulus* Dist., *Bolinlila* Dist., *Faenius* Dist., *Tylozygoides* Mats.). Since the only difference is the location of the process of the side lobes of the pygofer (apical or dorsoapical in *Amahuaka*, ventral in *Mileewa*), both genera could even be regarded as synonyms. *Amahuaka* is considered a recent derivative of an immigrant of the *Mileewa* stock, apparently distributed by adventitious means from tropical Africa. The same distributional pattern is also found in certain other primarily palaeotropical leafhopper groups, such as the genus *Krisna* Kk. (Tassinae, *Krisnini*, two species in the West Indies), the subfamily Nirvaniinae (nine genera in Central and South America) and the genera *Eovulturnops* Ev. and *Dlabotata* Lv. (representatives of the African *Citorus* group of the Penthimiinae, South America).

Like *Mileewa*, *Amahuaka* is quite variable in the male genital structures. On the basis of the body form, coloring and chaetotaxy of the pygofer the following groups can be distinguished: 1) the *lordosa* group (*lordosa* Young, *jurcata* Young, *peruviana* Young, *variabilis* sp.n., *setigera* Young, *bicornis* sp.n. and *atrifrons* sp.n.) are blackish, ±

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bluntly headed species in which the crown black with an inverted anchor-shaped pale figure; and the pygofer usually with macrosetae (reduced in *bicornis* and *atrifrons*, absent in *lordosa*). *A. wagnerorum* Young from Costa Rica is apparently an offshoot of this group too, although it differs from the other species in the bright colour pattern of the upper surface. 2) the *ebena* group (*monoceros* sp.n., *ebena* Young, *pungens* sp.n., *jocosa* sp.n. and apparently also *immaculata* (Fowl.)) are gracile, blackish species, head acute, crown black (save in *jocosa*), with the upper margin of face black and pygofer without macrosetae; and 3) the *ornatella* group (*ornatella* Young, *spinigera* sp.n., *scutellaris* sp.n., *septemlineata* Young, *vermiculata* sp.n., *angustula* (Fowl.)) which are brightly colored species with variegated pattern on crown, pronotum, scutellum and elytra; the crown rather strongly produced, pygofer without macrosetae.

The African Mileewaninae species live on undergrowth in rain, cloud, gallery and savannah forests. *Amahuaka ebena* as recorded from *Eupatorium adenophorum* (YOUNG 1965:377). The biology of the other species of the genus is unknown.

All type specimens are in the DeLong collection, Ohio State University.

Amahuaka variabilis n.sp.

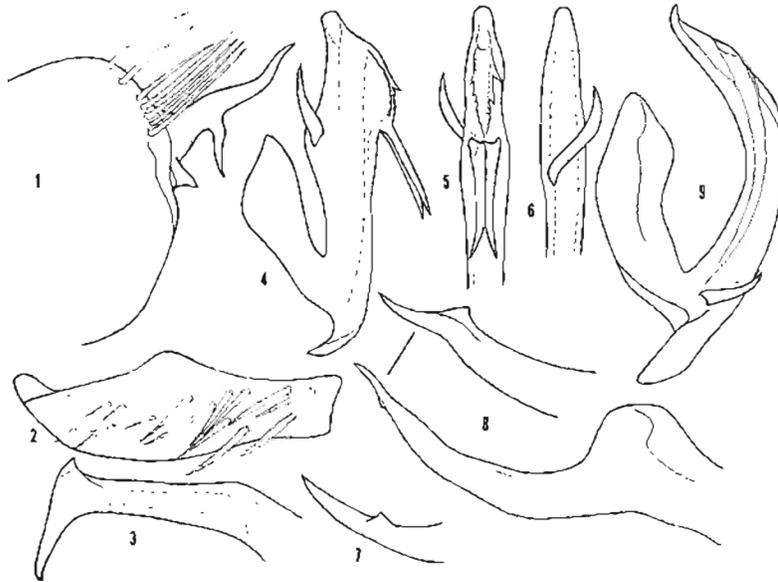
(Figs. 1-6)

Length 4.9-5.25 mm. Crown dark brown, a narrow inverted anchor-shaped figure with central portion extending to basal margin and a dash near anterior corner of either eye yellowish, basal margin with two pale brown spots; eyes purplish grey. Pronotum and scutellum castaneous, tip of the latter with variable degree of yellow. Elytra dark brown; clavus excluding tip, yellowish hyaline; a broad band across middle of corium, a small spot in base of first apical cell and apical margin broadly vitreous. Dorsum of abdomen dark, under surface and legs pale yellowish.

Body form as in *A. peruviana*. Crown rather strongly produced, 1.9 (♂) or about 2.15 (♀) times as long at middle as laterally, 1.1 (♂) or 1.2 (♀) times as broad basally, 1.15 (♂) or 1.2-1.3 (♀) times as long as median length of pronotum.

Male genitalia with side lobes of pygofer broadly rounded, with long bifurcate appendage and several macrosetae. Aedeagus flattened; ventral surface with a pair of falcate appendages directed basad and with a pair of longitudinal serrate lamellae below gonopore, dorsal surface with a single claw-like process. Hind margin of female seventh sternum bluntly angularly produced at middle.

Variability: In a male from Chiltepec the middle vitreous band on the corium is absent, only the commissural margin of the clavus is yellowish and the crown is slightly shorter, 1.83 times as long at middle as laterally, 1.05 times as long as broad and as long as median length of pronotum.



FIGS. 1-6. *Amahuaka variabilis* n.sp. 1, Pygofer, laterally. 2, Plate ventrally. 3, Style ventrally. 4, Aedeagus laterally. 5, Apex of aedeagus ventrally. 6, Aedeagus dorsally. FIGS. 7-9. *A. setigera* Young. 7, Appendage of pygofer. 8, Style ventrally. 9, Aedeagus laterally.

Holotype male Finca Prusia Chiapas XII-4-32. Paratypes 1 ♂ Chiltepec, Oax, XII-1011927; 1 ♀ Cordoba Vera Cruz XI-20-24, A. Dampf; 1 ♀ same as holotype; 1 ♀ Santa Julia Chiapas III-1t-1938; 1 ♀ Mexico A. Dampf.

Related to *A. furcata* Young and *A. peruviana* Young but readily distinguished by the male genitalia.

Amahuaka peruviana Young

One female specimen from Sinchono, Peru is referred to this species, collected by J. G. Sanders in 1943. This species was originally recorded from Callanga, Peru.

Amahuaka setigera Young
(Figs. 7-10)

Male aedeagus provided with a pair of claw-like basal appendages not mentioned in the original description (Young 1965:373-374).

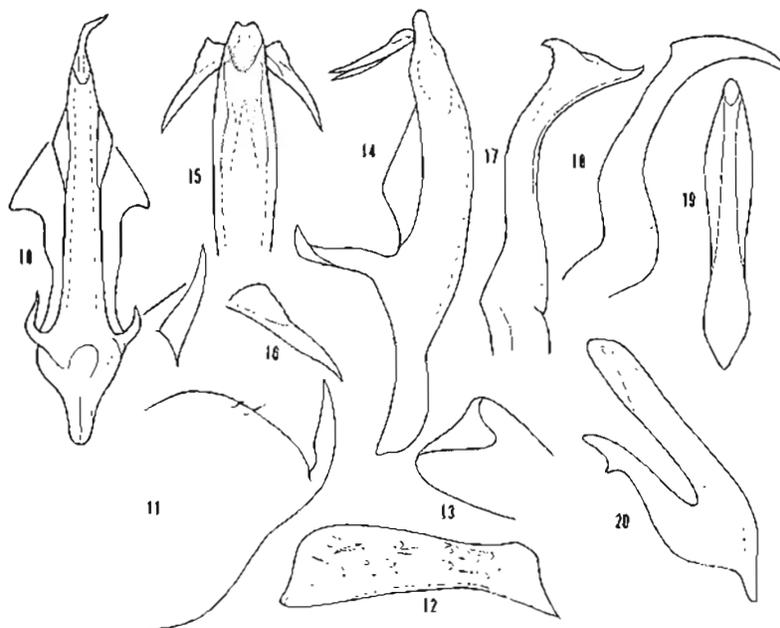


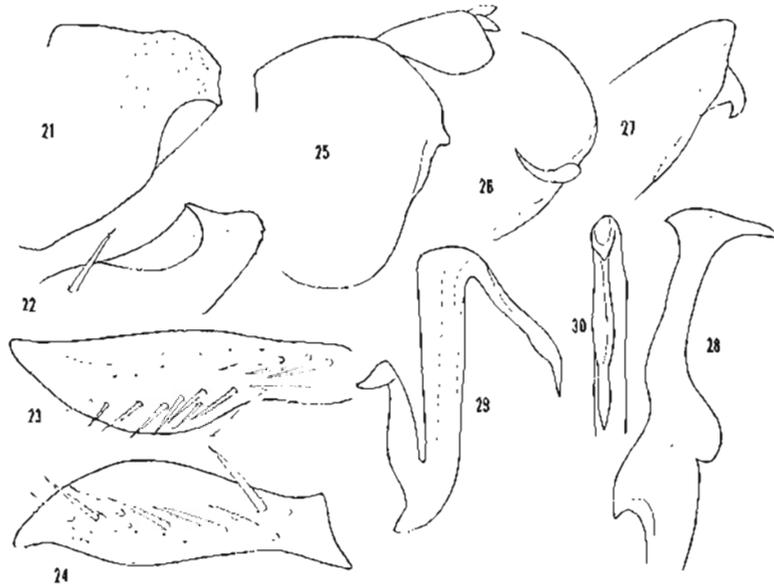
FIG. 10. *Amahuaka setigera* Young. 10, Aedeagus ventrally. FIGS. 11-17. *A. bicornis* n.sp. 11, Pygofer laterally. 12, Plate ventrally. 13, Apex of plate dorsally. 14, Aedeagus laterally. 15, Aedeagus ventrally. 16, Aedeagus appendage. 17, Style ventrally. FIGS. 18-20. *A. atrifrons* n.sp. 18, Style ventrally. 19, Aedeagus ventrally. 20, Aedeagus laterally.

Specimens at hand from Cordoba, Vera., Mexico XII-15-1924. A. Dampf; Fortin, Vera. X-9-1941 and Orizaba, Vera. X-8-1941, De-Long, Good, Caldwell and Plummer Colls. Originally recorded from Tamazunchale, Mexico.

Amahuaka bicornis n.sp.

(Figs. 11-17)

Length 4.6 mm. Like *A. setigera* but 1) paler, pronotum castaneous with only sides of anterior margin black, scutellum yellowish with castaneous basal triangles and elytra castaneous with only costal margin and apical part of corium black; 2) crown blunter, 1.8 times as long at middle as laterally, as long as broad, as long as median length of pronotum and face somewhat flatter; and 3) male genitalia dissimilar, side lobes of pygofer with a claw-like process directed dorsad and with only two delicate macrosetae in upper margin; style with prominent



FIGS. 21-23. *Amahuaka atrifrons* n.s. 21, Pygofer laterally. 22, Pygofer ventrally. 23, Plate ventrally. FIGS. 24-30. *A. monoceros* n.sp. 24, Plate ventrally. 25, Pygofer laterally. 26, Pygofer medially. 27, Pygofer ventrally. 28, Style ventrally. 29, Aedeagus laterally. 30, Apex of aedeagus ventrally.

anteapical angle; aedeagus with a pair of apical appendages directed dorsally and dorsal, surface of shaft with median lamella.

Holotype: male Finca Belem, Chiapas, Mexico III-11-1938.

Amahuaka atrifrons n.sp.

(Figs. 18-23)

Length 4 mm. Like *A. setigera* but 1) face black, transverse band of the pale anchor-shaped figure on crown broader; fourth apical cell of elytra with a small pale triangle; dark markings on under surface of thorax larger, tips of hind tarsi black (pale in other species of the group). 2) Crown remarkably broad, 1.9 times as long at middle as laterally, 0.9 times as long as broad, as long as middle length of pronotum, with anterior margin distinctly carinate, face flattened and 3) with dissimilar male genitalia, side lobes of pygofer minutely tuberculate apically, without a distinct process, ventral margin with a single macroseta; genital plates acuminate apically; apex of style falcate with a distinct anteapical tooth; aedeagus small, shaft straight, tubular.

Holotype: male, Vergel, Chiapas, Mexico VI-3-1935.

Amahuaka monoceros n.sp.
(Figs. 24-30)

Length 4.5 mm. Like *A. ebena* Young but face flatter. Crown acute, 2.25 (♂) or 2.63 (♀) times as long at middle as laterally, 1.5 (♂) or 1.7 (♀) times as long as broad, 1.5 (♂) or 1.8 (♀) times as long as median length of pronotum.

Male genitalia with side lobes of pygofer rounded, without macrosetae, appendage claw-like recurved dorso-mesally, not visible in lateral aspect. Genital plate sharply tipped. Style with apex falcate, anteapical angle sharp. Aedeagus flattened and provided with a single falcate apical appendage directed ventrally. Hind margin of female seventh sternum straight with small rounded median lobe (usually convex in *A. ebena*).

Holotype: male Buena Vista, Gro. Mexico X-23-1941, DeLong, Good, Caldwell, Plummer Colls. Paratype: 1 ♀ same data as holotype.

Amahuaka ebena Young

Two specimens from Buena Vista, Gro., Mexico X-23-1941, DeLong, Good, Caldwell & Plummer Colls., have been examined. Originally recorded from Cuernavaca and Tamazunchale, Mexico.

Amahuaka pungens n.sp.
(Figs. 31-35)

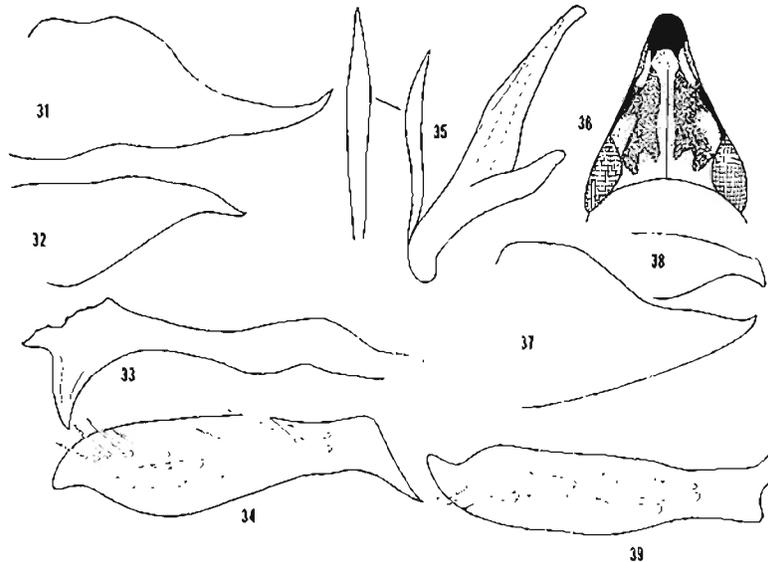
Length 4.5-5.0 mm. Like *A. ebena* but face flatter. Crown 2.3-2.4 (♂) or 2.63 (♀) times at middle as laterally, 1.33-1.47 (♂) or 1.61 (♀) times as long as broad, 1.33-1.47 (♂) or 1.61 (♀) times as long as median length of pronotum.

Male genitalia with side lobes of pygofer without macrosetae, strongly prolonged, sharp tipped. Genital plates acuminate apically. Apex of style enlarged, below the sharp anteapical angle, minutely dentate. Aedeagus with a single falcate basal appendage, shaft lamellate.

Holotype: male Orizaba, Vera., Mexico X-8-1941, DeLong, Good, Caldwell & Plummer Colls. Paratypes: 2 ♂ same data as holotype.

Amahuaka jocosa n.sp.
(Figs. 36-41)

Length 4.5-4.75 mm. Like *A. ebena* but readily distinguished by the color of the crown (Fig. 36); apex black, disk with a large dark brown figure on either side, the rest of crown white with slight brownish tinge at middle. Pronotum castaneous, anterior margin with faint pale spots behind eyes. Scutellum castaneous with minute and faint yellowish markings at middle and apically.



FIGS. 31-35. *Amahuaka pungens* n.sp. 31, Pygofer laterally. 32, Pygofer ventrally. 33, Style ventrally. 34, Plate ventrally. 35, Aedeagus laterally. FIGS. 36-39. *A. jocosa* n.sp. 36, Head dorsally. 37, Pygofer laterally. 38, Pygofer ventrally. 39, Plate ventrally.

Face flatter than in *A. ebena*. Crown 2.54 times as long at middle as laterally, 1.56 times as broad as long, 1.5 times as long as median length of pronotum.

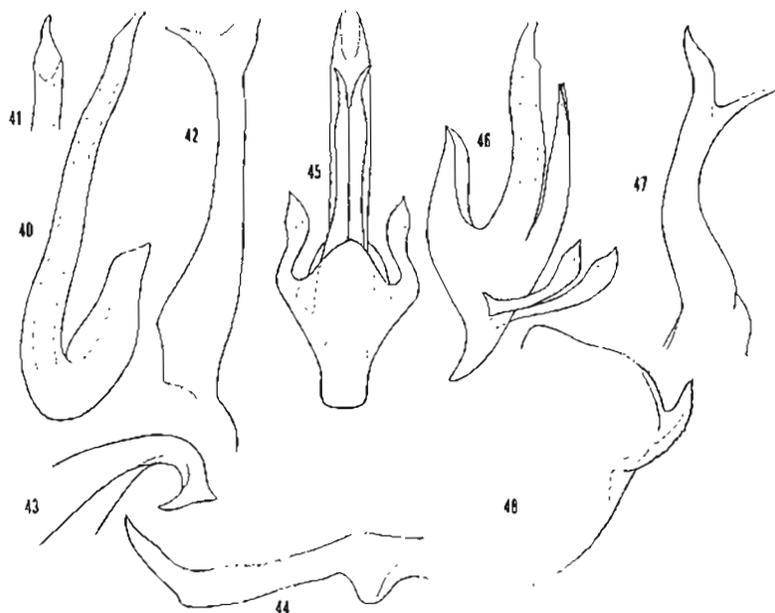
Male genitalia with pygofer as in the preceding species but side lobes somewhat shorter. Genital plates as in *A. pungens*. Apical part of style long, anteapical angle large and blunt. Aedeagus simple, shaft long, tubular.

Holotype male, Cordoba, Vera., Mexico XI-20-1924. A. Dampf. Paratype (♂) same data as holotype.

Amahuaka ornatella Young
(Figs. 34-46)

Male aedeagus with two falcate median processes instead of a single one as mentioned in the original description (Young 1965:377-378).

Eight specimens from Mexico have been examined. Five from Cordoba, Vera. XII-15-1922, A. Dampf; one each from Fortin, Vera., X-9-1941, Orizaba, Vera., X-8-1941 (DeLong, Good, Caldwell & Plummer Colls.) and Cosomatepes, Vera.

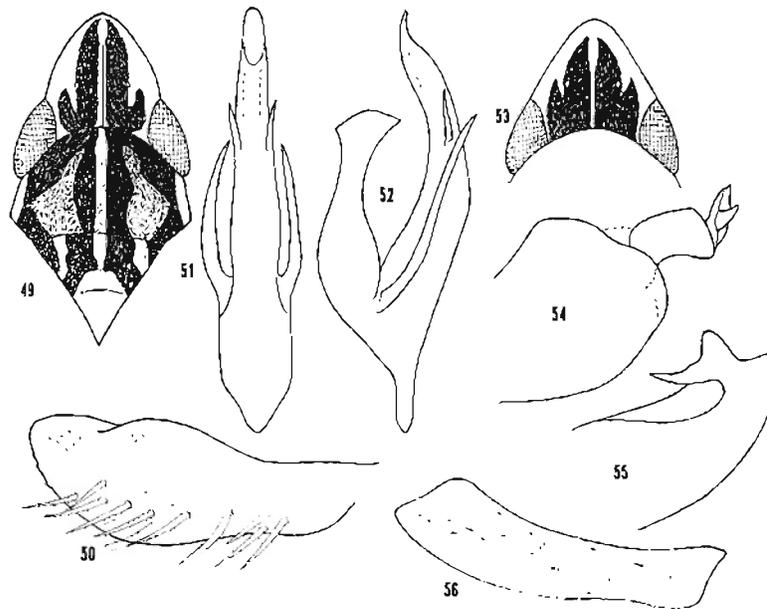


FIGS. 40-42. *Amahuaka jocosa* n.sp. 40, Aedeagus laterally. 41, Apex of aedeagus ventrally. 42, Style ventrally. FIGS. 43-46. *A. ornatella* Young. 43, Pygofer ventrally. 44, Style ventrally. 45, Aedeagus ventrally. 46, Aedeagus laterally. FIGS. 47-48. *A. spinigera* n.sp. 47, Style ventrally. 48, Pygofer laterally.

Amahuaka spinigera n.sp.
(Figs. 47-52)

Length 4.0-4.2 mm. Whitish ochraceous. Crown (Fig. 49) with two J-shaped dark brown figures. Eyes grey. Lateral margins of pronotum narrowly whitish ochraceous; disk dark brown with a narrow median stripe and a large spot on either side reddish brown. Apex of scutellum whitish ochraceous, base reddish brown with four dark fuscous longitudinal spots. Elytra dark brown, a longitudinal band from clavus to apical part of brachial cell yellowish brown; costal margin with two conspicuous triangular yellowish or vitreous spots, one at base, one subapically; apical margin narrowly whitish. Dorsum of abdomen dark. Under surface and legs immaculate. Genital segment (δ) brown.

Resembling *A. ornatella* but much smaller. Crown 1.65-1.73 (δ) or 1.82-1.9 (φ) times as long as middle as laterally, 1.06-1.12 (δ) or 1.11-1.17 (φ) times as long as broad; as long as (δ) or slightly longer than (φ) median length of pronotum.



FIGS. 49-52. *Amahuaka spinigera* n.sp. 49, Head, pronotum and scutellum. 50, Plate ventrally. 51, Aedeagus ventrally. 52, Aedeagus laterally. FIGS. 53-56. *A. scutellaris* n.sp. 53, Head. 54, Pygofer laterally. 55, Pygofer ventrally. 56, Plate ventrally.

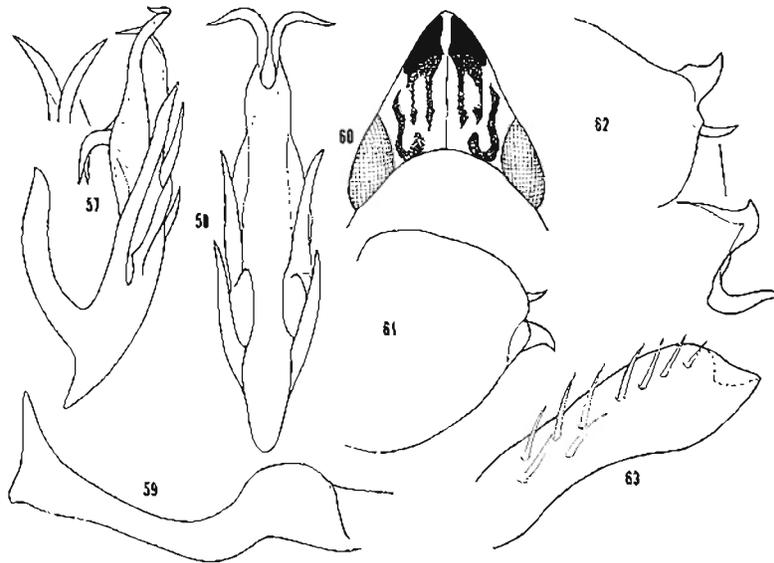
Male genitalia with side lobes of pygofer short and rounded, with short sclerotized minutely tuberculate process, macrosetae absent. Genital plates broad, apical part with minute tubercles. Style distinctive with spine like anteapical angle. Aedeagus with two pairs of falcate processes directed caudally. Posterior margin of female seventh sternum subtruncate, roundedly produced at middle.

Holotype: male Cordoba, Vera. Mexico XI-20-1924, A. Dampf. Paratypes: nine specimens same as holotype.

Near *A. ornatella* but readily distinguished by the small size and the male genitalia.

Amahuaka scutellaris n.sp.
(Figs. 53-59)

Length 4.5-4.75 mm. Whitish yellow, crown (Fig. 53) dark brown with anterior margin and a narrow median line pale. Eyes reddish grey. Pronotum and lateral margins pale; disk dark brown, medially reddish brown. Scutellum pale yellow, basal triangles purplish. Elytra as in



FIGS. 57-59. *Amahuaka scutellaris* n.sp. 57, Aedeagus laterally. 58, Aedeagus ventrally. 59, Style ventrally. FIGS. 60-63. *A. vermiculata* n.sp. 60, Head. 61, Pygofer laterally. 62, Pygofer ventrally. 63, Plate ventrally.

preceding species but inner subapical area of corium mostly pale. Dorsum of abdomen dark. Under surface and legs immaculate.

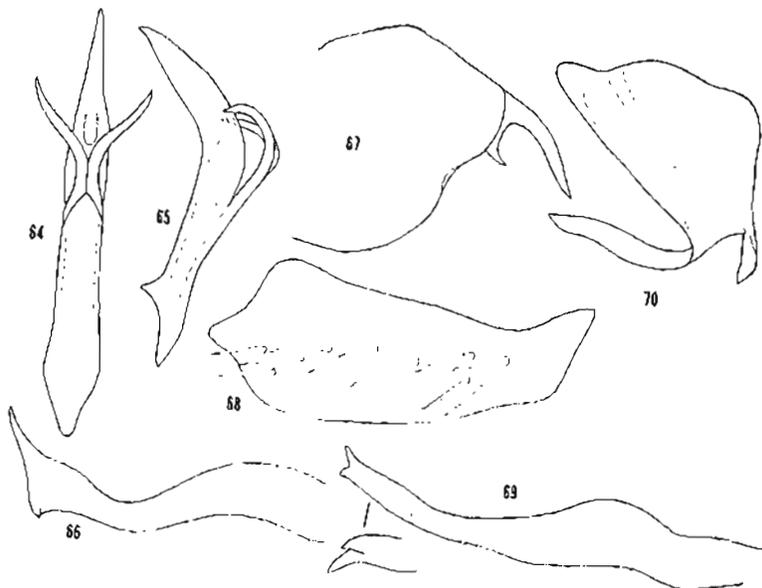
Crown 1.82 times as long at middle as laterally, 1.05 times as long as broad, 1.11 times as long as median length of pronotum.

Male genitalia with pygofer very short, side lobes broadly rounded, the irregularly bilobate apical appendages not visible in lateral aspect, macrosetae absent. Genital plates narrow, obliquely truncate apically. Style triangularly expanded apically. Aedeagus bearing two pairs of apical and one pair of dorsal appendages.

Holotype: male, Pachuca, Hidalgo, Mexico XII-19-1929. Paratypes: 2 ♂ same data as holotype.

Amahuaka vermiculata n.sp.
(Figs. 64-66)

Length ♂ 5 mm, ♀ 5.5 mm. Crown (Fig. 60) pale ochraceous with two triangular black apical spots and six longitudinal dark brown stripes, the two median pairs straight and short, the lateral pair long and vermiculate; in ♀ the dark pattern is largely confluent with only a median band and a few minute pale lateral spots. Eyes red. Pronotum reddish brown, anterior margin ornamented with confluent vermiculate dark brown lines behind eyes, lateral margins, a median stripe and two



FIGS. 64-66. *Amahuaka vermiculata* n.sp. 64, Aedeagus ventrally. 65, Aedeagus ventrally. 66, Style ventrally. FIGS. 67-70. *A. angustula* (Fowl.). 67, Pygofer laterally. 68, Plate ventrally. 69, Style ventrally. 70, Aedeagus laterally.

longitudinal triangular discal spots, dark brown. Scutellum white with a median brown longitudinal spot; basal triangles reddish brown with two longitudinal dark brown stripes. Elytra hyaline, pale brown, apical portion of claval commissure, costal margin, a transverse apical band and slight suffusions on other parts of corium, dark brown; sub-apical area of costal margin with two conspicuous white spots, also apical margin narrowly white at middle. Dorsum of abdomen dark brown. Under surface of legs immaculate, pale brown. Female seventh sternum infuscate.

Crown 1.83 (δ) or 2.0 (♀) times as long at middle as laterally, 1.1-1.2 times as long as broad, 1.05 (δ) or 1.15 (♀) times as long as median length of pronotum.

Male genitalia with pygofer short, side lobes broadly rounded, with two claw-like processes, macrosetae absent. Genital plates narrow, apex of style triangularly expanded. Aedeagus with a pair of falcate processes recurved caudally.

Female seventh sternum with posterior margin curvate.

Holotype: male, Carapan, Mich., Mexico X-2-1941, DeLong, Good, Caldwell & Plummer Colls. Paratypes: 1 δ Mexico City D.F.-Toluca Rd.; 1 ♀ same, except IX-26-1945.

Readily distinguished by the coloring and the male genitalia.

Amahuaka angustula (Fowl.)
(Figs. 67-70)

Male genitalia with side lobes of pygofer broadly rounded, bearing long bilobate apical processes, macrosetae absent. Genital plates broad. Apical part of style long and very narrow, apex bilobate. Aedeagus distinctive, lamellate and broadly triangular as in certain African *Mileewa* species.

Mexican material examined: 1 ♀ Carapan, Mich. X-5-1941; 1 ♂ Cuernavaca, Morelos IX-8-1939; 1 ♀ Rio Frio D.F. X-7-1941 and 1 ♀ Zitacuaro, Mich., X-5-1941 DeLong, Good, Caldwell & Plummer. Originally recorded from Mexico.

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