STUDIES OF THE MEXICAN DELTOCEPHALINAE:[1, 2] *ALIGIA* AND SOME NEW ALLIED GENERA AND SPECIES (HOMOPTERA: CICADELLIDAE)

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ABSTRACT

The Mexican species of *Aligia* Ball and related genera are largely unknown or undescribed. Hepner (1942) published a study of the 32 species of *Aligia* known to occur in the United States, and some of these will undoubtedly be found in Mexico eventually. In this paper we describe three new species of *Aligia*; one new species of *Frequenamia* DeLong; and two new genera, one with two new species and the other with a single new species. All holotypes and allotypes are in the DeLong Collection; paratypes will be deposited in the collection of the United States National Musuem.

Aligia mexicana, new species

(Fig. 1–4)

Length.—5.0–5.5 mm.

Coloration.—Ground color yellowish brown with darker brown markings; facial markings somewhat variable, but clypellus and clypeus usually darker than genae, clypellus at times with minute red flecks, clypeal arcs pale, lora variably darkened distally; crown with a pair of irregular, small, brown spots at extreme apex, at times with a few minute red flecks and vague darkening near eyes; pronotum mostly mottled with brown except for the anterior portion on either side of middle and lateral margins; scutellum variably touched with brown on basal angles, midline, and apex; forewing milky hyaline with two wide transverse brown bands, one across middle, the other across and beyond claval apex, distinctness of bands variable, apical cells at least in part embrowned, veins brown.

Structure.—Forewing with numerous false veinlets in central portion of clavus, brachial cell, and central anteapical cell.

Male genitalia.—Pygofer process in lateral view inverted U-shaped, with a comparatively short projection on ventral margin near base and a small tooth on distal margin near apex (fig. 1); aedeagus in lateral view broad, abruptly upturned, and narrowed at blunt apex (fig. 2); aedeagus in posterior view narrow with gonopore large and much below apex (fig. 3); in dorsal view, connective shorter than style, distal portion of style blunt but bearing a laterally directed projection on outer margin (fig. 4).

Female genitalia.—Posterior margin of seventh sternum distinctly blackened or embrowned, slightly produced on middle third, and with a small notch at center.

Types.—Holotype male and one paratype male, Mexico City, D. F., Mexico (W. 18 Kms.), IX–1–39, C. C. Plummer, D. M. DeLong. Allotype female and one paratype male, Carapan, Mich., Mexico, X–2–41 (Km. 432), DeLong, Good, Caldwell, and Plummer. Paratype male, Jacala, Hgo., IX–26–41 (12 mi. S.), DeLong, Good, Caldwell, and Plummer.

Notes.—The form of the male pygofer process and the style separate *mexicana* at once from any previously described member of *Aligia*.

Aligia alvona, new species

(Fig. 5–7)

Length.—5.2–5.6 mm.

Coloration and Structure.—Like that of *A. mexicana* except as follows: pair of spots at coronal apex less distinct, mottling of pronotum less extensive and limited to discal portion.

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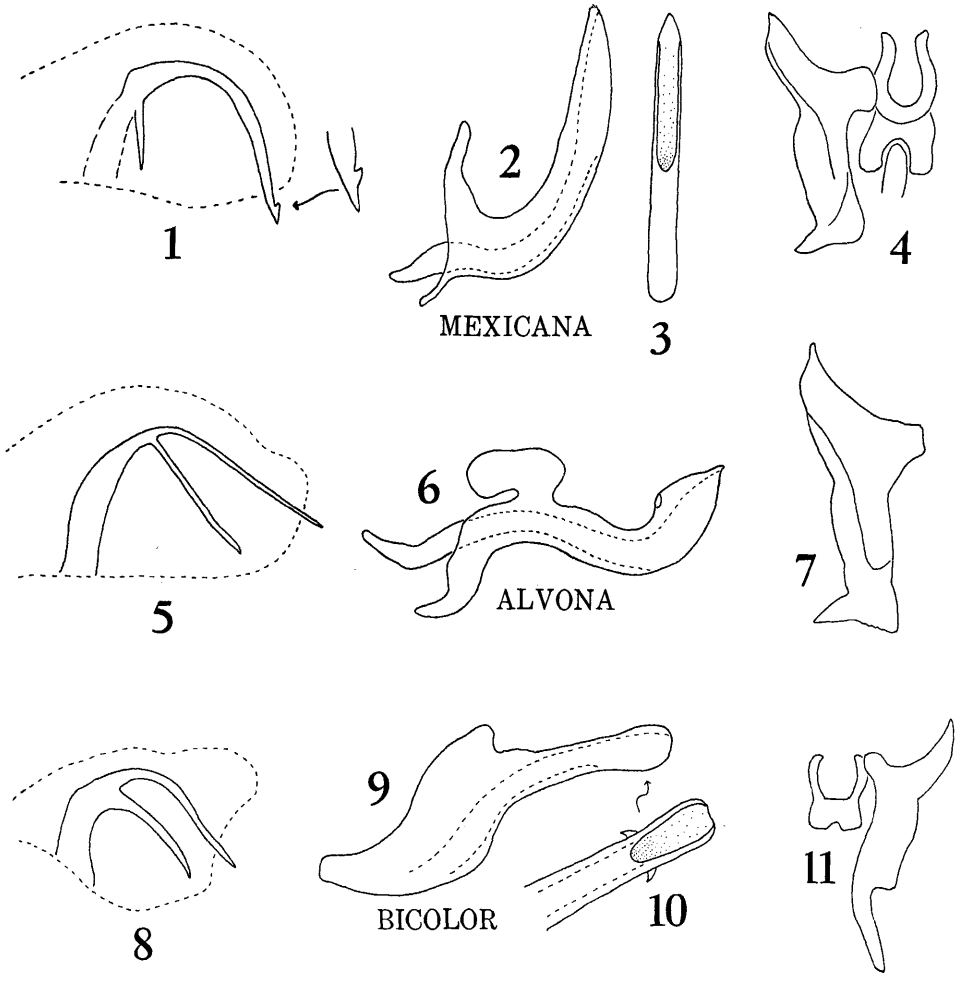
Male genitalia.—Pygofer process in lateral view bifurcated distally, dorsal portion longer, both portions very slender (fig. 5); aedeagus in lateral view broad, undulated, with extreme apex pointed, gonopore large and occupying most of ventral portion of shaft distally (fig. 6); connective like that of *mexicana*; style in dorsal view with distal portion subacute, bearing a laterally directed projection on outer margin (fig. 7).

Female genitalia.—Posterior margin of seventh sternum like that of *mexicana* except notch at center slightly larger.

Types.—Holotype male and allotype female, Taxco, Guerrero, Mexico, IX–9–39, DeLong and Plummer. Paratypes: five males, Tulancingo, Hdg., Mexico, X–25–45 (K–129), Stone, DeLong, Hershberger, and Elliott; one male, Lomas de Chapultepec, near Mexico City, D. F., Mexico, V–25–38, A. Dampf; four females, Mexico City, D. F., Mexico, Toluca Rd., IX–26–45,



FIGS. 1–11. *Aligia mexicana*, n. sp. Fig. 1, male pygofer laterally; fig. 2, aedeagus laterally; fig. 3, aedeagus posteriorly; fig. 4, connective and style dorsally. *Aligia alvona*, n. sp. Fig. 5, male pygofer laterally; fig. 6, aedeagus laterally; fig. 7, style dorsally. *Aligia bicolor*, n. sp. Fig. 8, male pygofer laterally; fig. 9, aedeagus laterally; fig. 10, distal portion of aedeagus ventrally; fig. 11, connective and style dorsally. Note: The forked processes in figures 1, 5, and 8 are on the inner surface of the pygofer.

DeLong, Hershberger, and Elliott; two females, Jalapa Rd., Vera., Mexico, X-13-45, Shaw, DeLong, and Hershberger.

Notes.—The shape of the aedeagus and style provide the distinguishing features of *alvona.* In habitus it is much like *mexicana,* but it is slightly more robust than that species. The styles of both species are quite similar, a feature which sets both of them apart from any previously described members of the genus.

Aligia bicolor, new species

(Fig. 8–11)

Length.—4.0–4.5 mm.

Coloration.—Ground color yellowish brown with extensive darker brown markings; face, except for reddish brown upper portion of clypeus and yellowish lateral areas of genae, heavily washed with black; clypeal arcs at least in part pale and with some touches of yellow on clypellus and lora; crown with anterior margin and discal area irregularly dark brown, in these markings a pair of spots at extreme coronal apex and a single spot at each lateral edge of darkened discal area; pronotum mottled with dark brown, mottling evanescent towards lateral margins and sometimes discally; scutellum heavily washed with dark brown except on lateral margins where paler edges are broken with brown extensions from darker discal area; forewing hyaline to milky hyaline variably washed with brown on basal half, an irregular brown band from claval apex to costal margin, distinctness of band variable, apical cells distally embrowned, veins brown.

Structure.—Forewing without false veinlets in clavus or brachial cell, but with a few in central anteapical cell.

Male genitalia.—Pygofer process in lateral view bifurcated distally, dorsal portion longer, both portions moderately slender (fig. 8); aedeagus in lateral view broadest near base, abruptly narrowed at half its length, apex rounded (fig. 9); distal portion of aedeagus ventrally with gonopore large and below apex, and with a small tooth on either side near base of gonopore (fig. 10); in dorsal view, connective short and mesal lobe of style long and fingerlike (fig. 11).

Female genitalia.—Female unknown.

Types.—Holotype male and paratype male, D. F., Mexico, (M. B. 409), A. Dampf.

Notes.—The shape of the aedeagus, combined with the bifurcated pygofer process, distinguishes *bicolor* from any previously described member of *Aligia.*

Pseudaligia, new genus

Type-species.—Pseudaligia nigropunctata, new species.

Closely related to *Aligia* and separated from it only by features of the male genitalia. In *Aligia,* the pygofer processes are large, curved, and hooklike; further, they arise subapically from the ventral margin and lie within the genital capsule (figs. 1, 5, and 8). In *Pseudaligia,* the pygofer processes are not hooklike, and they arise from the apex of the ventral margin and are visible laterally, ventrally, or posteriorly (figs. 12 and 16).

Pseudaligia nigropunctata, new species

(Fig. 12–15)

Length.—4.7–5.3 mm.

Coloration.—Ground color pale grayish tan to sordid white; face with small, irregular, scattered spots of dark brown to black, those on upper portion of clypeus often orange brown; crown, anterior margin with four minute black spots, about equidistant from each other and from eyes, coronal surface posteriorly with a curved transverse orange line on middle and four small black spots near hind margin; pronotum pale with irregular darker markings, often with six more or less distinct spots along anterior margin; scutellum pale, basal angles marked with brown-margined yellowish areas, a pair of small but prominent black spots anterior to transverse sulcus, area posterior to sulcus variably yellowish before pale apex, lateral margins on either side embrowned before apex; forewing whitish hyaline with brown vermiculate markings and brown veins, vermiculate markings often absent in an area extending from preapically on clavus across to costal margin producing an irregular pale band, clavus often with four or more poorly defined dark spots along commissural margin.

Structure.—Forewing with many false cross veinlets produced by brown vermiculate markings.

Male genitalia.—Pygofer in ventrolateral view with a pair of moderately long, simple, crossed processes (fig. 12); aedeagus in lateral view S-shaped, extreme apical portion slender, with some irregular teeth preapically (fig. 13); aedeagal apex in dorsal view with gonopore preapical and extreme apex cleft (fig. 14); in dorsal view, connective short and mesal lobe of style long, slender, and blunt apically (fig. 15).

Female genitalia.—Seventh sternum with lateral angles rounding to posterior margin, posterior margin slightly produced and faintly notched at middle, lateral portions of underlying segment exposed at rounded margins.

Types.—Holotype male, and sixty-one paratype males, Iguala, Guerrero, Mexico, IX–11–1939, D. M. DeLong. Allotype female and paratype male, Taxco, Guerrero, Mexico, X–26–41, K–150, DeLong, Good, Caldwell, and Plummer. Additional paratypes: forty-seven males, same locality as holotype except X–25–41, DeLong, Good, Caldwell, and Plummer; three males, Chilpancingo, Guerrero, Mexico, X–25, 41, DeLong, Good, Caldwell, and Plummer.

Notes.—The shape of the aedeagus and pygofer processes are unique.

Pseudaligia albocincta, new species

(Fig. 16–19)

Length.—4.0–4.2 mm.

Coloration.—As in *P. nigropunctata* except as follows: facial markings in form of irregular, broken, transverse stripes on clypeus, mesal longitudinal area of clypellus variably darkened; pronotum with markings darker, anterior margin contrastingly paler and spots obscure or absent; forewing with brown markings in three irregular patches, on middle two thirds of clavus to costal margin, on claval apex and anteapical cells, and on distal portions of apical cells.

Male genitalia.—Pygofer in posterior view with ventral margins produced as long, sharp, ventrally toothed, crossed processes (fig. 16); aedeagus in lateral view narrowly U-shaped with broad base, finely toothed preapically on proximal margin, with a ventrally pointed thickening on shaft (fig. 17); aedeagus posteriorly with apex somewhat bulbous, gonopore slightly subapical (fig. 18); in dorsal view, connective short, and style with mesal lobe short and lateral lobe minute and acute (fig. 19).

Female genitalia.—Female unknown.

Types.—Holotype male and three paratype males, Chilpancingo, Guerrero, Mexico, X–25–41, DeLong, Good, Caldwell, and Plummer.

Notes.—The features of the male genitalia separate *albocincta* at once from *nigropunctata.* The facial markings and the darker and more distinct banding of the forewings provide additional distinguishing characters.

Ilagia, new genus

Type-species.—*Ilagia zebula,* new species

Related to *Aligia, Pseudaligia,* and *Euttettix* Van Duzee. As in *Euttettix,* the inner anteapical cell of the forewing is open basally; this contrasts with the closed inner anteapical cell found in *Aligia* and *Pseudaligia.* It differs from all these genera by features of the male genitalia. In *Ilagia* the aedeagus is rather small

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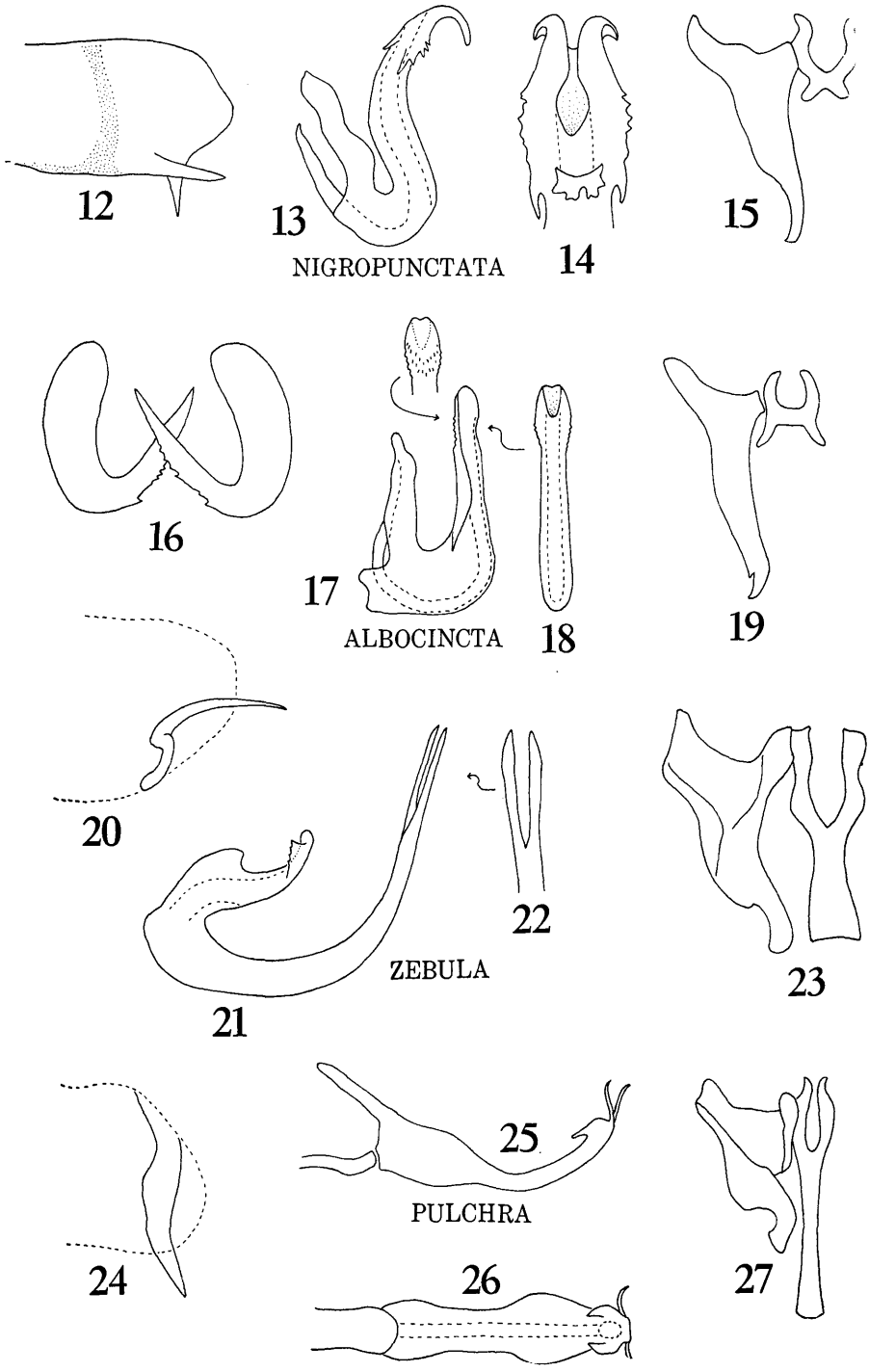
EXPLANATION OF FIGURES 12–27

FIGS. 12–27. *Pseudaligia nigropunctata,* n. g. and n. sp. Fig. 12, male pygofer ventrolaterally, dotted area indicates a thickening on inner surface; fig. 13, aedeagus laterally; fig. 14, aedeagal apex dorsally; fig. 15, connective and style dorsally. *Pseudaligia albocincta,* n. sp. Fig. 16, male pygofer posteriorly; fig. 17, aedeagus laterally; fig. 18, aedeagus posteriorly; fig. 19, connective and style dorsally. *Ilagia zebula,* n. g. and n. sp. Fig. 20, male pygofer laterally; fig. 21, aedeagus laterally; fig. 22, apical portion of ventral aedeagal process posteriorly; fig. 23, connective and style dorsally. *Frequenamia pulchra,* n. sp. Fig. 24, male pygofer laterally; fig. 25, aedeagus and portion of connective laterally; fig. 26, aedeagus dorsally; fig. 27, connective and style dorsally. Note: The processes in figures 20 and 24 are on the inner surface of the pygofer.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NIGROPUNCTATA
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ALBOCINCTA
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ZEBULA
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PULCHRA
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and has a massive ventral process; the connective is long and distinctly Y-shaped with a long stalk.

Ilagia zebula, new species

(Fig. 20–23)

Length.—5.6 mm.

Coloration.—Ground color tan to yellowish, heavily marked with darker shades of brown; face with central portion of clypeus and clypeal arcs, areas under eyes and around antennal bases, lateral edges of lora, and clypellus mesally, all dark brown; crown with a pair of rather small irregular dark brown spots at apex, ocelli partly ringed with brown, rest of coronal surface mottled with yellowish brown; pronotum, except for anterior mesal portion, mottled with dark brown; scutellum with basal angles brown and vague embrowning on midline; forewing milky or whitish, veins dark brown, cells variably marked with dark brown.

Structure.—Form very robust; crown not longer at middle than next to eyes, a slight transverse depression behind anterior margin; in lateral view, coronal margin between ocelli thin and sharp; forewing without extra veinlets.

Male genitalia.—Pygofer in lateral view with a slender, somewhat sickle-shaped process on inner surface arising from ventral margin (fig. 20); aedeagus in lateral view recurved distally with a toothed fin near apex, gonopore large and occupying most of ventral surface, ventral process very long and deeply forked at apex (figs. 21 and 22); in dorsal view, connective stout and nearly as long as style, style with mesal lobe heavy and somewhat bulbous apically, lateral lobe only a rounded convexity (fig. 23).

Female genitalia.—Female unknown.

Type.—Holotype male, Tamazunchale, San Luis Potosi, Mexico, XI–2–45, DeLong, Hershberger, and Elliott.

Notes.—The sharp coronal margin and the male genital structures provide the distinguishing characters of *zebula.*

Frequenamia pulchra, new species

(Fig. 24–27)

Length.—4.5–5.5 mm.

Coloration.—Ground color pale brown to yellowish white with extensive darker markings; face, except for genae laterally and spaces between clypeal arcs, heavily washed with dark brown to black; crown with four pale brown to black spots just above anterior margin, discal area on either side of darkened coronal suture with an irregularly quadrangular or triangular orange patch, patch usually bordered with dark brown anteriorly and with one or two small brown spots posteriorly; pronotum mottled with light to dark brown, except mesally on anterior margin; scutellum with all angles variably orange except at their extreme apices; orange areas variably bordered irregularly with brown to dark brown, midline usually darkened; forewing whitish, veins brown, cells heavily marked with irregular brown or dark brown areas, a distinct whitish area delimited on clavus at two thirds its length, usually with two variably distinct whitish areas on costal margin in distal half.

Structure.—Form moderately robust; crown at middle not longer than next to eye, postmarginal depression distinct; forewing with inner anteapical cell open basally with many crossveins in brachial cell.

Male genitalia.—Pygofer in lateral view with a broad blade-like process arising from dorsal margin distally and directed downward (fig. 24); aedeagus in lateral view broadest basally, shaft narrowed, apex distally with a pair of moderately long slender processes, and proximally with a long tooth (fig. 25); aedeagus in dorsal view broadest subapically (fig. 26); in dorsal view, connective much longer than style with stalk slender, style with mesal lobe a rounded convexity (fig. 27).

Female genitalia.—Seventh sternum with posterior margin strongly produced from lateral angles and convexly rounded.

Types.—Holotype male, allotype female, and nine paratype males, Chiapa de Corzo, Mexico on Grijalva River, A. Dampf. Additional paratypes: two males, Reforma Tabasca, Mexico,

VI–23–38, A. Dampf; three females, Tehauntepec, Oaxaca, Mexico, X–13–41, DeLong, Good, Caldwell, and Plummer; three females, Tetela del Rio, Guerrero, VIII–13–30, J. Parra; one male and one female, Monterey, Mexico, VIII–11–36, E. D. Ball; one female, Vera Cruz, Mexico, 1959, N. L. Krauss.

Notes.—This is the second species assigned to the genus *Frequenamia* DeLong (1947: 63). The type-species, *guerrera* DeLong, is also known only from Mexico. The two species are easily separated on the basis of external characters. The head of *guerrera* is less rounded, the orange markings on the crown are lacking, the pronotum lacks extensive brown mottling, and the forewings are only lightly marked with brown. The male genitalia provide many additional features for separating *pulchra* and *guerrera*. In *pulchra*, the aedeagus has but one pair of slender apical processes and the mesal lobe of the style is comparatively short and hooked (figs. 25 and 27), whereas in *guerrera* the aedeagus has two pairs of slender apical processes and the mesal lobe of the style is long and somewhat undulated (DeLong 1947: figs. 2 and 3).

LITERATURE CITED

DeLong, D. M. 1947. A new genus (*Frequenamia*) and species of Mexican leafhoppers related to *Mesamia* (Homoptera: Cicadellidae). Bull. Brooklyn Ent. Soc. 42: 63–64.

Hepner, L. W. 1942. A revision of the genus *Aligia* (Homoptera, Cicadellidae) North of Mexico. Kansas Univ. Sci. Bull. 28: 253–293.