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## CONTRIBUTIONS TO THE KNOWLEDGE OF THE PSYLLIDAE OF MEXICO

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(continued from last issue)

The remainder of the records are given in chronological order. Desierto de los Leones, 20 km. southwest of Mexico, D. F., swept from dense undergrowth in forest, September 23, 1923. Chapultepec Heights, southwest of Mexico, D. F., rolling hills with agave and *Opuntia*, swept in the floor of a dry barranca on *Viguiera* sp., February 5, 1924. Chapingo, Mexico, on alfalfa April 30, 1924. Chapingo, on *Senecio salignus* July 11, 1924. Summit of Mount Ajusco, south of Mexico, D. F., swept from grass, May 10, 1925. Chapultepec Heights, D. F., swept from low vegetation February 16, 1926. Cerro Huixtepec near San Cristobal Las Casas, Chiapas, 2700 meters, swept from grass between *Baccharis* bushes, June 14, 1926. Zontehuitz Mountain, north of San Cristobal Las Casas, swept from *Baccharis* and *Gaultheria* at the summit, 2800 meters, 280 specimens, June 20, 1926. San Cristobal Las Casas, swept from treeless hill, covered with flowers, in the village June 29, 1926; swept from flowers on top of a hill in the village, July 2, 1926; at light July 3, 1926. Santa Barbara on Mexico-Puebla road, swept from corn, May 14, 1927. Jalapa, Vera Cruz, on light, March 30, 1933. Bella Vista, 12 km. from Mexico, D. F. on highway to Cuernavaca, swept from shrubs, September 17, 1933. Lomas de Chapultepec, Mexico, D. F. swept from flowers of *Schinus molle*, May 27, 1928. Mexico, D. F., on *Salix*, September 5, 1938. Monte Alto mountain range, northwest border of the Valley of Mexico, swept on *Baccharis* shrubs, November 15, 1938. Lagunas de Zempoala, Morelos, swept on flowers of *Senecio salignus*, Lake Tonatihagua, May 5, 1941.

Originally described from specimens from California it has also been recorded from Arizona, New Mexico and Texas, United States.

The probable host is *Baccharis* sp.

The type is in the Crawford Collection, United States National Museum.

### *Trioza proximata* Crawford

Figs. 36, 37.

1911 *Trioza proximata* Crawford, Pom. Coll. Jour. Ent. 3:424, 429, 435

1941 *Trioza proximata* Caldwell, Ohio Jour. Sci. 41:422

Length to tip of folded wings 3 to 3.5 mm.

**Color:** Light green to testaceous. Tips of antennae and styliform portion of female genital segment black.

**Structure:** Head narrower than thorax. Occiput large, posterior margin of eyes opposite lateral ocelli. Vertex with discal sulci, prominent medial suture. Genal processes short, heavy, blunt, 0.5 as long as vertex. Antennae twice as long as width of head. Thorax broad, strongly arched. Pronotum strongly descending but not depressed below plane of vertex. Forewings large, 2.5 times as long as wide, rounded apically; Rs long, somewhat sinuate, marginal cells equal. Hind wings 0.7 as long as forewings. Metatibiae with serrate basal tubercle, 1 outer and 3 inner apical spines. Anterior portion of metacoxae short, raised.

Male proctiger long, caudal margin arcuately produced, prominent epiphysis at apex. Forceps long; in lateral view moderately broad, curved cephalad, tapering, apices black, with small black tooth; in caudal view almost straight sided, slightly arched, row of setae on medial margin. Female genital segment very long, 0.75 as long as remainder of body, proximal 0.3 large, tapering distal portion very slender, acuminate and appressed to ovipositor, latter extending beyond valves; dorsal valve longer than ventral.

This species is apparently quite common in Mexico, numerous specimens being at hand. Outside of Mexico it has been collected to date only in southern Arizona. Closely related to *T. collaris* it can usually be distinguished from the latter by its smaller size and more rounded wings. The female genital segment is distinctive. The male is very similar to *collaris*.

Specimens at hand bear data as follows: Desierto de los Leones, southwest of Mexico, D.F., swept from undergrowth in forest (*Senecio*, *Salvia*, etc.) September 23, 1923; swept from grass (Zacaton) in open pine forest between the Ajusco and the Xitle volcano, north of Mexico, D. F., October 7, 1923; lava fields of Pedregal, south of Mexico, D.F., swept from *Senecio praecox*, December 2, 1923; Mexico, D.F., suburb Hipodromo, swept from lawn after five rainless months, May 4, 1924; Chapingo, Mexico, *Senecio salignus*, July 11, 1924; Desierto de los Leones, swept from *Baccharis* sp., February 22, 1925; Peñon de Baño on the shores of Texcoco Lake, a small volcano with scanty xerothermic vegetation, January 31, 1926; San Jacinto, D. F., at light, November 16, 1931, June 30, 1932; Mount Telapón, Mexico, summit, 3900-4000 meters, swept on grass, September 29, 1940; Xoconusco Valley, near Ixtapan del Oro, Mexico swept on low weeds in a former corn field, June 8, 1941; swept from a lawn scattered with trees and shrubs in Chapultepec Park, Mexico, D. F., through the summer of 1941 (an ecological survey) on May 30, June 15 and 29, July 13 and October 9.

Originally described from specimens from Oaxaca and Orizaba it has also been recorded from Mexico, D. F., and environs by Caldwell.

Host: Unknown

Type in Crawford Collection, United States National Museum

***Trioza nigriscutum* n. sp.**

Figs. 38, 39.

Length to tip of folded wings 3.75 mm.

**Color:** General color, including forewings, greenish yellow. Mesoscutum,

except small marginal areas, black or dark brown, abdomen green.

**Structure:** Head nearly as wide as thorax, almost vertical. Vertex plane, discal impressions broad and shallow. Genal processes large, straight, acute, not touching from base, as long as vertex, on nearly same plane as vertex. Antennae 1.66 times as long as width of head. Thorax well arched. Pronotum depressed below plane of vertex. Prescutum nearly as long as wide. Forewings large, straight, 3 times as long as wide, bluntly angulate; costa unusually straight, Rs very long, somewhat sinuate, marginal cells equal. Hind wings 0.7 as long as forewings. Metatibiae with small basal tubercle, 1 outer and 3 inner apical spines. Metacoxae not produced anteriorly.

Male proctiger short, slightly produced caudad below apical epiphysis. Forceps shorter than proctiger; in lateral view stout, straight, slightly curved on caudal margin to blunt apices; in caudal view stout, slightly bowed to blunt apices, heavily setate on mesal margins.

**Holotype**, male, swept in dense bush in pine and oak tree forest on the summit of Cerro Vista Hermosa (2400 meters) in the Moshbiquil Range near San Cristobal Las Casas, Chiapas, July 17, 1926, in Dampf's collection.

Host: Unknown

***Trioza longigenae* n. sp.**

Fig. 40.

Length to tip of folded wings 3 mm.

**Color:** General color black. Antennae, tibiae and tarsi lighter. Head and thoracic dorsum conspicuously marked with white and red. Vertex white except median suture, discal impressions and line next to margin. Genal processes white. Thorax with 5 more or less complete white stripes margined with red. Wings hyaline except spot at tip of clavus, small one midway between this and base, black.

**Structure:** Body with short sparse pubescence. Head narrower than thorax. Vertex with deep discal impressions, prominent medial suture, sparsely pubescent, abruptly margined. Genal processes very long, slender, acute, divergent, longer than vertex. Antennae 1.5 times as long as width of head. Thorax quite flat for genus. Pronotum short, not depressed below vertex. Forewings broadly rounded as in *Psylla*, 2.4 times as long as wide; Rs straight, of moderate length, cubital cell larger than medial. Metatibiae with serrate basal carina, 1 outer and 3 inner apical spines. Metacoxae scarcely produced anteriorly.

Female genital segment shorter than rest of abdomen, valves subequal in length, both acute, ventral somewhat upturned.

**Holotype**, female, taken on a light, San Jacinto, D. F., 2240 meters, April 11, 1933, in Dampf's collection.

This species although a member of *Trioza* has the general appearance and coloration of many *Psylla*. The unique specimen is described because of its distinctness although the hind wings and most of the abdominal dorsum have been destroyed by pests.

Host: Unknown

***Trioza psyllihibitus* n. sp.**

Figs. 41, 42.

Length to tip of folded wings 2.5 mm.

**Color:** General color red. Legs, genitalia, antennae and distal half of genal processes light brown. Most of head and some markings on thorax white.

**Structure:** Head nearly as wide as thorax. Vertex with deep discal impressions, medial suture prominent, rounded to genae. Genal processes long, slender, divergent, acute, parallel to plane of vertex, nearly as long as vertex. Antennae 1.5 times as long as width of head. Thorax moderately arched. Pronotum short, not below vertex. Forewings small, broadly rounded, 2.5 times as long as wide; Rs long, slightly sinuate, marginal cells small, medial larger than cubital. Hind wings 0.75 as long as forewings. Metatibiae with small basal spur, 1 outer and 3 inner apical spines. Metacoxae scarcely produced anteriorly.

Male genitalia large. Proctiger strongly produced caudad below apical epiphysis. Forceps as long as proctiger; in lateral view straight, tapered distally to blunt apex; in caudal view moderately stout, nearly straight, a black mesally projecting tooth at apex.

**Holotype**, male, swept from dense bush in pine and oak tree forest on the summit of Cerro Vista Hermosa, 2400 meters, in the Moshbiquil range near San Cristobal Las Casas, July 17, 1926.

This species in general appearance resembles the genus *Psylla*, due to the rounded forewings and only moderately arched thorax. It seems to be most nearly related to *T. mexicana*.

Host: Unknown

Holotype in Dampf's collection.

***Trioza (Megatrioza) diospyri* (Ashmead)**

Figs. 43, 44, 45.

1881 *Psylla diospyri* Ashmead, Can. Ent. 13:222.

1885 *Trioza diospyri* Riley, Proc. Biol. Soc. Wash. 2:70.

1905 *Trioza koebelei* Kirkaldy, Can. Ent. 37:290.

1910 *Trioza latipennis* Crawford, Pom. Coll. Jour. Ent. 2:230.

1919 *Megatrioza diospyri* Crawford, Phil. Jour. Sci. 15:193.

1926 *Spanioza diospyri* Enderlein, Ent. Mitt. 15:400.

1926 *Phyllopecta diospyri* Ferris, Can. Ent. 58:16.

1928 *Phyllopecta diospyri* Ferris, Can. Ent. 60:245.

1938 *Phyllopecta diospyri* Caldwell, Ohio Biol. Surv., Bull. 34:249.

1941 *Phyllopecta diospyri* Caldwell, Ohio Jour. Sci. 41:422.

1941 *Trioza koebelei* Caldwell, Ohio Jour. Sci. 41:422.

Length to tip of folded wings 4.5 mm.

**Color:** General color shining black. Meso and metatibiae, all tarsi, genal processes and antennae except tip, light.

**Structure:** Entire body sparsely clothed with long hairlike setae. Head broad but narrower than thorax. Vertex plane, with slight discal impres-

sions. Genal processes short, rounded, about 0.5 as long as vertex, slightly divergent. Antennae about 1.5 times as long as width of head. Thorax strongly arched. Pronotum strongly depressed, entirely below level of vertex. Forewings very large, almost twice as long as body, about 2.75 times as long as wide, acutely angled at apex; marginal cells unusually large, medial very large, Rs short, less than 0.5 as long as wing, straight. Hind wings very small, less than 0.5 as long as forewings. Legs long. Metatibiae without basal armature, 1 outer and 3 inner apical spines. Metacoxae produced anteriorly as raised spur larger than meracanthus.

Male genital segment small. Proctiger somewhat longer than forceps, produced caudad as large blunt lobe, anus on prominent epiphysis. Forceps almost straight in lateral view; in caudal view broad, straight basally, apical 0.3 incurved, apex with several small black teeth. Female genital segment of medium size, about 0.5 as long as rest of abdomen, valves acute, ventral up-curved to meet dorsal, latter longer, entire segment usually pointing ventrad.

As the specific name indicates this form inhabits persimmon (*Diospyros*). It is wide spread throughout the southeastern part of the United States, being limited in its occurrence by the range of its host. Mr. O. H. Swezey has compared specimens of *diospyri* with the specimens from which Kirkaldy described *Trioza koebele*i and they are identical. Apparently there was a confusion of Koebele's data as both Kirkaldy's specimens and those on which the species *anceps* is based bear the number 1780. The latter is the species which forms galls on the leaves of the avocado. Caldwell has indicated in private correspondence that the specimens which he recorded as *koebele*i are in fact *diospyri*.

Specimens are at hand bearing the following data: Cuernavaca, November 5, 1922, E. C. Smyth; Torreon, Coahuila, swept on cotton, June 19, 1930; Hacienda Alamo near Saltillo, Coahuila, June 9, 1931, swept on alfalfa; swept from flowering onions, Agricultural School near Saltillo, Coahuila, June 10, 1931; Nuevo Laredo, Tamaulipas, swept in the air at sunset on border of the river, February 6, 1934.

Previous records for Mexico are La Providencia, near Acapulco, Guerrero, G. F. Ferris and Santa Engracia, Tamaulipas, November 4, 1938, J. S. Caldwell (recorded as *Trioza koebele*i).

Host: *Diospyros virginiana* L.

Type No. 14820, United States National Museum.

### *Trioza albifrons* Crawford

Figs. 46, 47, 48.

1910 *Trioza albifrons* Crawford, Pom. Coll. Jour. Ent. 2: 231, 355.

1910 *Trioza rotundipennis* Crawford, Pom. Coll. Jour. Ent. 2: 231, 236.

1910 *Trioza similis* Crawford, Pom. Coll. Jour. Ent. 2: 231, 352.

1910 *Trioza fovealis* Crawford, Pom. Coll. Jour. Ent. 2: 233.

1911 *Trioza similis fovealis* Crawford, Pom. Coll. Jour. Ent. 3: 423, 428, 438.

Length to tip of folded wings 3 to 3.5 mm.

Color: General color from green to light yellow to brown to black. In

lighter forms only eyes, distal 0.5 of antennae and last segment of tarsi, dark. In dark forms, rim of vertex, male genitalia and usually legs, light. (Between these extremes all variations in color occur).

**Structure:** Head small, narrower than thorax. Disc of vertex depressed, edges carinate, protruding in front. Genal processes acute, divergent, parallel to plane of vertex, about 0.66 as long as vertex. Antennae 1.5 times as long as width of head. Thorax strongly arched. Pronotum depressed below plane of vertex. Forewings varying from angular to round apically; Rs short to long, marginal cells equal. Hind wings 0.7 as long as forewings. Metatibiae without basal armature, 1 outer and 3 inner apical spines.

Male proctiger slightly longer than forceps, basal 0.75 roundly produced caudad. Forceps stout, arched heavy, black tipped apices, anterior margin excavate near apex. Female genital segment 0.5 to 0.65 as long as rest of abdomen, valves approximately equal, almost straight to acute or subacute apices.

This species is abundant throughout North America. It inhabits *Urtica* spp. and is very closely related to *T. urticae* an old world species, the type of the genus.

Numerous specimens are at hand with the following data: Xochimilco, D. F., September 30, 1923 swept from every description of biocoenosis (including *Urtica*); Popotla, D. F., June 19, 1924, swept from weeds along a water ditch; Mixquic, D. F., April 29 and May 17, 1938, on *Urtica dioica angustifolia*; El Chico, Hidalgo, September 15, 1938, swept on weeds along the road; Lagunas de Zempoala, Morelos, June 5, 1941, swept on grass.

Host: *Urtica* spp.

Type in the Crawford Collection, United States National Museum.

### ***Trioza incidata* n. sp.**

Figs. 49, 50, 51.

Length to tip of folded wings 2.75 mm.

**Color:** General color orange red. Abdomen, except male genitalia, thoracic venter and antennae fuscous. Genae and legs lighter.

**Structure:** Head large, as wide as mesoscutum. Vertex plane, scarcely impressed discally, rounded down anteriorly, median suture prominent. Genal processes 0.8 as long as vertex (as long as median suture), strongly tapered, contiguous basally, somewhat divergent. Antennae about 1.66 times as long as width of head. Thorax moderately arched. Pronotum large, depressed below vertex anteriorly. Forewings 2.5 times as long as wide, roundly angled at apex; Rs long, somewhat sinuate, marginal cells equal, radular areas prominent. Hind wings over 0.66 as long as forewings. Metatibiae with large, stout basal spurs, 1 outer and 3 inner apical spines. Metacoxae well developed anteriorly.

Male genitalia small. Proctiger roundly produced caudad below apical epiphysis. Forceps shorter than proctiger; in lateral view stout, straight, a deep broad oblique sulcus near apex forming a somewhat rounded antero-

lateral lobe and a longer, apically truncate process, mesal process terminating anteriorly as a sharp point; in caudal view stout basally, strongly bowed outward, narrowed to sharp, black nearly touching apices, many stout setae projecting mesad near base. Female genital segment shorter than rest of abdomen, bulbous basally, both valves very abruptly constricted to short caudal projections, dorsal valve longer than ventral, tip of each sharp.

**Holotype**, male **allotype**, female, 1 male and 2 female paratypes taken at a light, San Jacinto, D. F. (2240 meters), May 24 and 26, 1932. Other paratypes as follows: 1 male and 1 female taken in the same manner and same locality July 6, 1932; 1 female swept from low oak shrub, approximately 2500 meters, on slope of Monte Alto, northern part of the Valley of Mexico near Fernandez Leal, November 15, 1938; 2 males and 3 females swept from shrubs and bushes in mixed forest, Desierto de los Leones, September 23 and December 9, 1923; 1 male swept from dense shrubs on Cerro Huixtepec near San Cristobal Las Casas, Chiapas at 2600 meters June 14, 1926 seems to certainly be the same species. Another male swept from flowering plants in the Barranca de Chimalhuacan, Valley of Mexico, State of Mexico at 2300 meters, Dec. 20, 1931, is very similar except in some characters of the head and in coloration.

Host: Unknown

Holotype, allotype and paratypes in author's collection, paratypes in Dampf's collection.

The name (p. part of **incido**, L. v.—notched) alludes to the male forceps.

### ***Trioza mexicana* Crawford**

Figs. 52, 53, 54.

1911 ***Trioza mexicana*** Crawford, Pom. Coll. Jour. Ent. 3: 424, 428, 439.

1944 ***Trioza mexicana*** Caldwell, Ohio Jour. Sci. 44:62.

Length to tip of folded wings 3.75 mm.

**Color:** General color reddish brown. Males especially often chocolate brown with pale yellow markings, quite variable. Wings more or less fumose.

**Structure:** Head large, narrower than thorax. Vertex narrow, 0.7 as long as wide, with shallow discal impressions, anterior margin not abrupt, rounded to genae. Genal processes slender, acute, divergent apically, almost as long as medial length of vertex, 0.7 total length of vertex. Antennae from 1.6 to nearly 2 times as long as width of head. Thorax well arched. Pronotum strongly descending, not depressed below plane of vertex. Forewings large, about 2.5 times as long as wide, broadly rounded to angulate apically; Rs long, slightly sinuate, marginal cells of moderate size, about equal, radular areas on margin very prominent. Hind wings 0.77 as long as forewings. Metatibiae with small basal spur, 1 outer and 3 inner apical spines. Metacoxae slightly produced anteriorly.

Male proctiger large, roundly produced caudad, small apical epiphysis. Forceps large, in lateral view stout, turned cephalad and mesad toward apex, tips acute, in caudal view slender, nearly straight to black incurved tips, row of heavy setae on mesal margin. Female genital segment large, as long as

rest of abdomen or nearly so, valves straight, attenuate, black apically, serrate toward apex, ovipositor large, stout, blunt, exceeding valves.

At present known only from Mexico this species is quite variable in most characters. The specimens on which Crawford based the original description were taken near Cuernavaca, Morelos, on a species of *Rhus*, at 10,000 feet. Specimens at hand bear the following data:

Desierto de los Leones, *Pinus* and *Abies* forest 20 km. southwest of Mexico, D. F., swept from shrubs and bushes in the luxuriant undergrowth, July 20, 1924; same locality, from *Arbutus glandulosa*, March 29, 1925; San Jacinto, D. F., taken at light, March 19, 1933; Desierto de los Leones, swept from shrubs, May 22, 1938; Lomas de Chapultepec, near Mexico, D. F., on light, May 29, 1940 and June 1 and 5, 1941. Caldwell has recorded specimens taken on *Pocatepetl*.

Host: Unknown

Type in Crawford Collection, United States National Museum.

***Trioza mexicana minor* Tuthill**

Figs. 55, 56.

1911 *Trioza mexicana minuta* Crawford, Pom. Coll. Ent. 3:424, 429, 440.

[non] *Trioza minuta* Crawford, Pom. Coll. Jour. Ent. 2: 232, 1910.

1941 *Trioza mexicana minuta* Caldwell, Ohio Jour. Sci. 41:422.

1943 *Trioza mexicana minor* Tuthill, Ia. St. Coll. Jour. Sci. 17:576.

Length to tip of folded wings 3 mm.

This subspecies is distinguished from the typical form by its smaller size, some difference in the genital processes and the shorter female genital segment. It was originally described from Oaxaca. Specimens are at hand from scattered localities in Mexico as given below. It is also known from Arizona, United States.

Peñon Viejo, halfway between Mexico and Chapingo, swept from *Sedum dendroides* near the shore of Lake Texcoco, a characteristic xerophil vegetation, March 3, 1924. Mountain range of Tlaloc, near Chapingo, swept from *Abies*, June 15, 1924. Cordoba, Veracruz, swept in the bed of the Rio San Antonio, November 20, 1924. Desierto de los Leones, 20 km. southwest of Mexico, swept from *Baccharis* sp. in flower, February 22, 1925. Zontehuitz Mountain, north of San Cristobal Las Casas, Chiapas, swept on *Baccharis* and *Gaultheria* at 2800 meters, June 20, 1926. San Jacinto, D. F., taken at light, May 4, June 4, June 30, October 29, 1932 and April 11, 1933. Yotao, Oaxaca, in the Sierra Juarez, at light, November 15, 1937, Francisco Reyes collector. Slopes of Monte Alto, northern part of the Valley of Mexico, near Fernandez Leal, swept from low oak shrub, appr. 2500 meters, November 15, 1938.

Previous records are Mexico, D. F., September 1 and 13, 1939 (Caldwell).

Host: Unknown

Type in Crawford Collection, United States National Museum.

***Trioza mexicana curtigena* n. subsp.**

Length to tip of folded wings 2.75 mm.

Color: General color orange red. Abdomen fuscous ventrally.



**Structure:** Head as wide as thorax. Vertex plane, with broad discal impressions, rounded down anteriorly. Genal processes small, divergent, 0.5 as long as vertex. Antennae but slightly longer than width of head. Thorax well arched. Pronotum large, caudal margin deeply emarginate medially, nearly vertical. Forewings straight, broadly rounded, nearly 2.75 times as long as wide; Rs long, straight, marginal cells small, medial somewhat larger than cubital. Hind wings unusually large, 0.75 as long as forewings. Metatibiae with basal spur, 1 outer and 3 inner apical spines. Metacoxae scarcely produced anteriorly.

Female genital segment as long as rest of abdomen, large basally, attenuate apically; dorsal valve with styliform portion acute, spinose, somewhat upturned; ventral valve nearly as long as dorsal, upturned to acute apex.

**Holotype**, female, San Jacinto, D. F., 2240 meters, September 5, 1932, on light. Paratypes also collected on light at San Jacinto, D. F. as follows: 1 female, May 4, 1932; 1 female, June 4, 1932; 2 females, April 11, 1933.

The relationship of this form to *T. mexicana minor* is doubtful. Unfortunately no males are associated with any of the specimens at hand. Two mutilated males which seem to correspond to the above specimens are at hand from the mountain range of Tlaloc, near Chapingo, swept from *Abies* branches at 3000 meters, June 15, 1924. These males have genitalia very similar to *T. mexicana minor*. It is hoped that further collecting will serve to establish the status of these two entities. The subspecies *curtigena* differs from *minor* in the shorter antennae, shorter genal processes, longer wings with Rs straight and in the genitalia. The styliform portion of the female genital segment is much shorter in *curtigena* than in *minor* and is somewhat upturned giving it a quite distinctive appearance.

Host: Unknown

Holotype and paratype in author's collection, paratypes in Dampf's collection.

#### Genus *Paratrioza* Crawford

1910 *Paratrioza* Crawford, Pom. Coll. Jour. Ent. 2:228, 229

1911 *Allotrioza* Crawford (*pro parte*), Pom. Coll. Jour. Ent. 3: 423, 442.

Head narrower than thorax, scarcely deflexed. Vertex very distinctly margined, anterior margin usually slightly overhanging. Genae usually produced as short, broad, padlike processes, sometimes conical, sometimes not at all produced, never spherically swollen. Clypeus visible from anterior view. Antennae slender, variable in length. Thorax moderately arched. Pronotum short, descending anteriorly. Proepisternum strongly produced laterad. Forewings membranous, elongate, acutely angled to somewhat rounded apically, venation triozone. Hind wings much shorter than forewings. Metatibiae with basal spur, 1 outer and 2 inner apical spines. Metacoxae often with anteriorly projecting process.

Logotype: *Paratrioza cockerelli* (Sulc).

Only two species are represented in the Mexican fauna. One additional species, *P. dorsalis* assuredly occurs in the northern portion of the country

as it is known from southern Arizona. *P. lavaterae*, described from California probably occurs also. *P. simila*, Caldwell, is evidently identical with *P. dubia* and *P. plummeri* seems to belong to the genus *Kuwayama*.

#### KEY TO THE SPECIES OF PARATRIOZA

1. Genae produced as small conical processes; caudal lobes of male proctiger shorter than axial portion ..... **cockerelli**  
 Genae produced as flattened padlike lobes; caudal lobes of male proctiger longer than axial portion ..... **dubia**

#### ***Paratrioza cockerelli* (Sulc)**

Figs. 57, 58, 59.

1909 *Triozia cockerelli* Sulc, Acta Soc. Ent. Bohemicae 6:102-108.

1910 *Paratrioza ocellata* Crawford, Pom. Coll. Jour. Ent. 2: 229.

1910 *Paratrioza pulchella* Crawford, Pom. Coll. Jour. Ent. 2: 229.

1911 *Paratrioza cockerelli* Crawford, Pom. Coll. Jour. Ent. 3: 446, 448.

1925 *Paratrioza cockerelli* Ferris, Can. Ent. 57: 47-48.

1941 *Paratrioza cockerelli* Caldwell, Ohio Jour. Sci. 41:421.

Length to tip of folded wings 3 mm.

**Color:** General color typically black, with lighter markings varying from white to red. Vertex black except margin and transverse discal area light, dorsum of thorax with light longitudinal stripes. At least posterior portion of pronotum light. Prescutum with medial longitudinal band and horseshoe-shaped macula on each side, light. Scutum with two broad medial stripes, narrow one laterad and lateral margin, light. Posterior margin of abdominal tergites white, first one most prominently so. Extent of pattern variable, often appearing as dark markings on light ground color. Genal processes and legs usually light. Apex of antennal segments black. Wings hyaline.

**Structure:** Head of moderate size, narrower than thorax. Margins of vertex raised and abrupt; vertex discally impressed, medial suture prominent. Genal processes very small but distinct, divergent, acute. Clypeus visible from anterior or lateral view. Antennae 1.5 times as long as width of head. Thorax strongly arched. Pronotum strongly descending cephalad but not entirely depressed below plane of vertex. Forewings straight, roundly angular, about 2.5 times as long as wide; venation typical triozine, Rs long and sinuate. Hind wings 0.75 as long as forewings. Metatibiae with 2 inner and 1 outer apical spines, large basal spur. Caudal spur of metacoxae small, erect, straight, anterior one about same size but flattened.

Male proctiger in lateral view produced caudad as lobe of variable size and shape, from slender to almost triangular, length through lobe not greater than that of axial portion, with distinct apical epiphysis. Forceps as long as proctiger; in lateral view slightly curved cephalad apically to acute apices, flattened and somewhat incurved apically; in caudal view straight, narrow. Female genital segment short, about as long as last abdominal sternite; dorsal valve down-curved, black-tipped, acute, anal pore 0.5 total length; ventral valve shorter, black and acute at apex, slightly produced.

This important pest of potatoes and other solanaceous plants is widely distributed in western North America. Its occurrence in Mexico has been known for several years. Caldwell has recorded it from Santa Engracia, Tamaulipas, and Mexico, D. F.

Numerous specimens are at hand bearing the following data: San Jacinto, D. F., swept from weeds, September 10, 1923; Chimalhuacan, on Texcoco Lake, east of Mexico, swept from weeds in a garden, October 21, 1923; Peñon de Baño on the shore of Texcoco Lake, a small volcano with scanty xerothermic vegetation, January 31, 1926; swept from flowering potatoes, Guadalajara, Jalisco, June 11, 1927; swept from alfalfa, San Jacinto, D. F., May 28 and June 17, 1929; near Maltrata, Veracruz, tomatoes, May 17, 1930; swept from flowering onions at Agricultural School near Saltillo, Coahuila, June 10, 1931; Hacienda Fresno near Torreón, Coahuila, swept on weeds bordering a cotton field June 11, 1931; swept from tomatoes, El Dorado, Sinaloa, near sea level, March 22, 1932; Ciudad Camargo, Chihuahua, on beans, May 14, 1932, E. Q. Rocha collector; San Jacinto, D. F., on light, September 29, 1932; swept from *Urtica*, Mixquic, D. F., Xochimilco region, June 18, 1938; Hacienda de La Labor (Lourdes), San Luis Potosí, swept in the kitchen garden, November 28, 1938; swept from flowering *Senecio salignus* in company with *P. dubia*, Lagunas de Zempoala, Morelos, Tonatihu Lake, May 5, 1941; swept from weeds near the Agricultural School, Ayotzinapa, Tixtla Valley, Guerrero, 1500 meters, January 14, 1941.

Hosts: Potatoes, tomatoes, peppers and various other solanaceous plants.

#### ***Paratrioza dubia* Tuthill**

Figs. 60, 61, 62.

1943 *Paratrioza dubia* Tuthill, Ia. St. Coll. Jour. Sci. 17:591.

1944 *Paratrioza simila* Caldwell, Ohio Jour. Sci. 44:60.

Length to tip of folded wings 3.5 to 3.75 mm.

**Color:** Ground color of head and thoracic dorsum dirty white, more or less suffused with red, with prominent orange to dark brown markings. Vertex with narrow anterior band, short transverse band posteriorly, latter often broken. Genae light at least basally. Antennae light, apex of segments dark. Thoracic dorsum with variable longitudinal stripes. Venter dark. Legs light. Abdomen chocolate brown, first tergite white margined, last three with light area medially. Wings somewhat fumose. Genitalia light.

**Structure:** Head narrower than thorax. Vertex almost twice as wide as long, margins sharply raised, discally strongly depressed, 2 foveae near caudal margin, medial suture prominent. Genae slightly produced, padlike, not conical. Antennae twice as long as width of head. Thorax well arched. Pronotum short, depressed below plane of vertex. Prescutum acute anteriorly. Forewings large, straight, angulate, 2.75 times as long as wide; Rs long, sinuate, reaching furcation of media, marginal cells about equal. Hind wings slender, 0.66 as long as forewings. Legs large, metatibiae with small single or double basal spur, 1 outer, 2 inner apical spines. Metacoxae with caudal spur of moderate size, small anterior one.

Male proctiger with large slanting caudal lobes, axis through lobes longer than axial portion, lobes enclosing forceps, anus on oblique epiphysis. Forceps shorter than proctiger; in lateral view slender, very strongly curved cephalad to sharp apices; in caudal view broad basally then slender, slightly arched to apices. Female genital segment short, ventral valve quite flat, rounded and dark apically; dorsal valve narrower, hood-shaped, overhanging, apex black.

This species is represented in the material at hand by a great many specimens. It apparently occurs on *Senecio salignus* in great numbers. This is probably the host plant as many of the specimens taken from it are quite teneral.

Chapingo, Mexico, February 25, and 26, 1924, approximately 350 specimens swept from *Senecio salignus* in full flower; same locality, March 1, 15, and 17, 1924, swept from *Senecio salignus*, approximately 240 specimens (many teneral); Peñon Viejo, halfway between Mexico and Chapingo, swept from a solitary bush of *Senecio salignus* 3 adults, March 5, 1924; Chapingo, April 9 and 23, 1924, from *Senecio salignus* (fruiting), 177 specimens; Chapingo, May 16, 1924, 53 specimens from fruiting *Senecio salignus*; Chapingo, July 11, 1924, 31 specimens from *Senecio salignus*; Desierto de los Leones, March 29, 1925, swept from *Senecio salignus*, 1 specimen; San Cristobal Las Casas, Chiapas, June 4, 1926, swept from weeds outside the village, border of a meadow in flower, 1 specimen; same locality June 9, 1926, 7 specimens; Xoloc, Mexico, swept on *Senecio salignus* in flower, March 10, 1929, 74 specimens; San Jacinto, Mexico, September 24, 1929, swept from weeds along experimental vegetable plots, 4 specimens; Tenancingo, Mexico, swept from *Senecio salignus*, March 4, 1933; swept shrubs near a point called Bella Vista, 12 km. from Mexico on the highway to Cuernavaca, September 17, 1933, 4 specimens; Telapón Mountain, Tlaloc-Ixtachihuatl range in the Valley of Mexico, swept in open pine forest, July 25, 1937, 2 specimens; Lomas de Chapultepec, suburb of Mexico, swept from weeds, April 2, 1939, 1 specimen; Texcatenco near Oxcoacac, Mexico, Lerma Valley, swept from weeds, October 5, 1939, 1 specimen; Llano Grande, base of Mount Telapón, Mexico, swept from grass and shrubs, September 29, 1940, 5 specimens; Tonatihagua Lake, Lagunas de Zempoala, Morelos, swept from *Senecio salignus*, May 5, and June 5, 1941, 20 specimens.

Caldwell has recorded this species from Carapan, Michoacan, Rio Frio, Puebla, and San Cristobal, Guatemala under the name *P. simila*. These are the only recorded specimens other than the type series from Arizona and one pair of specimens from California.

Type in Snow Collection, University of Kansas, Lawrence, Kansas.

#### Genus *Kuwayama* Crawford

1911 *Epitrioza* Crawford, Pom. Coll. Jour. Ent. 3: 423, 452.

[non] *Epitrioza* Kuwayama, Trans. Sapp. Nat. Hist. Soc. 3: 55, 1910.

1911 *Kuwayama* Crawford, Pom. Coll. Jour. Ent. 3: 503.

Head but slightly narrower than thorax, scarcely deflexed. Vertex not

sharply margined, rounded anteriorly. Genae roundly swollen, prominent, antennae slender, moderately long. Thorax not strongly arched. Pronotum short, descending anteriorly. Forewings membranous, elongate, acute to subacute apically, venation triozone. Hind wings slender. Metatibiae with basal spur, 1 outer and 2 inner apical spines. Male proctiger without caudal lobes. Female genital segment elongate.

Orthotype: **Kuwayama medicaginis** (Crawford)

This genus is near **Paratrioza** on the one hand and **Rhinopsylla** in the **Car-sidarinae** on the other. The genae are often produced forward between the antennae giving an appearance of a cleft head as in **Rhinopsylla**. On the basis of the head characters alone these two genera cannot be distinguished. This accounts for Crawford having placed the same species in both of these genera. With the examination of a larger number of species of **Kuwayama** it becomes apparent that the general type of genital structure of both sexes is distinctive.

The species recently described by the author as **Rhinopsylla caldwelli**, found in Florida, is properly referred to **Kuwayama**. That described as **Paratrioza plummeri** by Caldwell is probably identical with **K. longipennis** here described as new. Since no specimens of **P. plummeri** are available for comparison the name **longipennis** is used until this question can be settled with certainty.

#### KEY TO THE SPECIES OF KUWAYAMA

1. Antennae 2.5 times as long as width of head; clypeus very prominent, black ..... **oaxacensis**  
 Antennae not over twice as long as width of head, clypeus smaller, not black ..... 2
2. Length to tip of folded wings 3.25 mm. or over; forewings 3 times as long as wide ..... **longipennis**  
 Length to tip of folded wings 3 mm; forewings not over 2.75 times as long as wide ..... 3
3. Male forceps with prominent antero-lateral projection; dorsal valve of female genital segment straight apically ..... **medicaginis**  
 Male forceps without accessory lobe; dorsal valve of female genital segment upturned apically ..... **sincera**

#### **Kuwayama medicaginis** (Crawford)

Figs. 63, 64, 65.

1910 **Paratrioza medicaginis** Crawford, Pom. Coll. Jour. Ent. 2: 229.

1911 **Epitrioza medicaginis** Crawford, Pom. Coll. Jour. Ent. 3: 452.

1914 **Kuwayama medicaginis** Crawford, U. S. Nat. Mus., Bull. 85:66.

1941 **Kuwayama medicaginis** Caldwell, Ohio Jour. Sci. 41:421.

Length to tip of folded wings 3 mm.

**Color:** General color sordid white to yellowish. Flavous markings on vertex and thorax, latter forming incomplete longitudinal stripes. Distal tarsal segments and apical 0.63 of antennae fuscous. (Crawford writes "yellowish green throughout." This is probably the color of living and fresh specimens).

**Structure:** Head narrower than thorax. Vertex long, discal impressions very deep; anterior margin overhanging median ocellus, somewhat rounded down. Genae roundly swollen ventrally, not touching. Clypeus plainly visible from front. Antennae 1.6 times as long as width of head. Thorax moderately arched. Pronotum not depressed below plane of vertex. Forewings slender, straight, angulate, almost 3 times as long as broad; Rs long, somewhat sinuate, marginal cells about equal. Metatibiae with prominent basal spur, 1 outer and 2 inner apical spines. Metacoxae raised anteriorly, plate-like.

Male proctiger short, curved caudad, caudal margin roundly produced, narrow apical epiphysis. Forceps almost as long as proctiger, broad basally, narrowed to obliquely truncate apices, flattened apically, apical margin heavy, crenate, black; a prominent, acute antero-lateral projection shorter than principal portion; base heavily pubescent. Female genital segment almost as long as rest of abdomen; apical portion of ventral valve very slender, acute, dark; dorsal valve longer, roundly blunt, black apically.

This insect is moderately abundant in southwestern United States. Originally described from Colorado it has been recorded from Texas, New Mexico, Arizona and California.

Specimens at hand are from the following scattered localities in the northern part of Mexico. Monclova, Coahuila, November 22, 1909, F. C. Bishopp. Chapingo, Mexico, May 30, 1924. Ciudad Juarez, Chihuahua, swept from young Acala cotton, July 4, 1927. Torreon, Coahuila, swept from cotton, June 19, 1930. Hacienda Alamo, near Saltillo, Coahuila, swept from alfalfa with some weeds, June 9, 1931. Hacienda Fresno near Torreon, Coahuila, swept on weeds bordering a cotton field, June 11, 1931; same data except from alfalfa; same data except from corn. Hacienda Nijini, Ixtlahuaca Valley, Mexico, swept from corn, July 1, 1931. Ciudad Camargo, Chihuahua, taken from beans, May 14, 1932, E. Q. Rocha collector. Tlahualilo, Durango, September 3-17, 1923, taken in airplane traps at altitudes of from 500 to 2000 feet. Previous Mexican records are Jalapa, Veracruz (doubtful), Santa Engracia, Tamaulipas and Mexico, D. F.

Host: Unknown

Type in Crawford Collection, United States National Museum.

**Kuwayama sincera n. sp.**

Figs. 66, 67, 68.

Length to tip of folded wings 3 mm.

**Color:** Dirty white with longitudinal markings on thoracic dorsum orange to chocolate brown. Typically brown on venter including clypeus and genae, sometimes light. Abdomen brown. Legs more or less embrowned.

**Structure:** Head small, narrower than thorax. Vertex with deep sulcus each side of prominent medial suture. Genae swollen, subhemispherical, slightly elongated. Antennae twice as long as width of head. Thorax narrow, moderately arched. Pronotum long, depressed below plane of vertex. Prescutum produced anteriorly as small epiphysis. Forewings 2.75 times as long as wide, angular; Rs long, sinuate, cubital cell larger than medial, radular areas

prominent. Hind wings large, 0.66 as long as forewings. Metatibiae with double basal spur, 1 outer and 2 inner apical spines. Metacoxae produced anteriorly as raised plate, posterior spurs large.

Male proctiger long, roundly, evenly produced caudad, with apical epiphysis. Forceps shorter than proctiger; in lateral view straight, cephalic margin excavate in apical 0.33, apex black, acute, incurved; in caudal view broad, straight, incurved apically, tips black. Female genital segment 0.5 as long as rest of abdomen; dorsal valve longer than ventral, apex styliform, upturned, ventral valve acute.

This species is similar to *Kuwayama medicaginis* in general appearance and structure. The genitalia of both sexes are very different however.

**Holotype**, male, **allotype**, female, 4 male and 3 female paratypes swept from low vegetation, Lomas de Chapultepec, Mexico, D. F., July 25, 1939. Additional paratypes with these data: Lomas de Chapultepec, D. F., on a yellow flowering composite, October 1, 1932; Desierto de los Leones, D. F., from a variety of plants on December 9, 1923, February 22, March 29, 1925, January 8, 1933; Chapingo, Mexico, February 25 and March 5, 1924; Cerro de Hongos, southwest of Mexico, swept from low vegetation, April 5, 1925; summit of Mount Ajusco, south of Mexico, swept from grass, treeless region, May 10, 1925, swept from *Senecio salignus* in flower, Xoloc, Mexico, March 10, 1929; swept from corn near Mexico, 1929; Cerro de Guadalupe, Valley of Mexico, on a yellow flowering composite, October 9, 1932; Presa de Dolores, Mexico, D. F., swept from flowers, *Cosmos*, *Cuphea*, *Tithonia*, etc., October 27, 1933; swept from low oak shrub on the slopes of Monte Alto near Fernandez Leal, northern part of the Valley of Mexico, November 15, 1938; swept from a lawn scattered with trees and shrubs, Chapultepec Park, Mexico, D. F., July 27, 1941; swept from flowering shrubs in mixed forest, Contreras, D. F., March 3, 1940.

Host: Unknown

Holotype, allotype and paratypes in author's collection, paraotypes in Dampf's collection.

### **Kuwayama oaxacensis** (Crawford)

Figs. 69, 70, 71.

1911 *Epitrioza oaxacensis* Crawford, Pom. Coll. Jour. Ent. 3: 452, 453.

1911 *Rhinopsylla jalapensis* Crawford, Pom. Coll. Jour. Ent. 3: 490.

1914 *Kuwayama oaxacensis* Crawford, U. S. Nat. Mus., Bull. 85:66.

1941 *Kuwayama oaxacensis* Caldwell, Ohio Jour. Sci. 41: 421.

Length to tip of folded wings 3.5 mm.

**Color:** General color tan (probably greenish when alive). Antennae entirely dark brown. Clypeus black. Most thoracic sclerites brown margined. Pro and mesothoracic legs more or less embrowned. Abdominal dorsum brown. Amount of embrowning quite variable. Head may be entirely dark brown.

**Structure:** Body slender, wings large. More or less pubescence on head and body. Head narrower than thorax. Vertex with deep sulcate impressions,

strongly excavate anteriorly. Lateral ocelli on prominent ridges. Genae but slightly cut off from vertex, roundly swollen. Antennae slender, 2.5 times as long as width of head. Clypeus prominent, visible from front. Thorax well arched. Pronotum long, not depressed below plane of vertex. Forewings large, angulate, 2.6 times as long as wide; venational characters somewhat variable, Rs rarely reaching furcation of media, marginal cells nearly equal, cubital sometimes somewhat elongate. Hind wings slightly over 0.5 as long as forewings. Metatibiae with sharp basal carina terminating in small spur, 1 outer and 2 inner apical spines. Metacoxae slightly produced anteriorly.

Male proctiger long, slender, roundly produced caudad. Forceps shorter than proctiger; in lateral view straight, more or less angularly produced on cephalic margin, apex roundly truncate; in caudal view stout, slightly arched to blunt apices; apices sharp, incurved, visible only in dorsal view or by dissection. Female genital segment as long as rest of abdomen, slender; dorsal valve slender, slightly upturned apically, tip blunt, ventral valve shorter than dorsal; straight, acute.

Paratypes of both *Kuwayama oaxacensis* and *Rhinopsylla jalapensis* are at hand. The latter specimens are fully matured and darkly colored, the former is teneral. There are no structural differences evident which are not common in the large series of specimens at hand. These differences are slight variations in the venation of the forewings and in the genae. The paratypes of *R. jalapensis* are the darkest specimens of all I have seen, having the entire head almost black. In all specimens except those that are quite teneral the clypeus is black and is a very prominent feature.

In addition to the paratypes mentioned above which are from Oaxaca and Jalapa specimens are at hand with the following data: Tlalpam, D. F. swept in fallow cornfield covered with *Gnaphalium*, *Verbena*, etc., September 16, 1923; Desierto de los Leones, D. F., swept from bush (*Senecio*, *Salvia*, etc.) September 23, 1923; Chapultepec Heights, D. F., swept in the bed of a dry barranca on *Viguiera*, sp., February 5, 1924; swept from weeds and shrubs, Cinco Encinos, near Barreal, Cordoba, Veracruz, 850 meters, September 11, 1924; Coscomatepec, 30 km., north of Cordoba, Veracruz, 1580 meters, swept in former cornfield, November 30, 1924; swept from running railway between Maltrata and Alta Luz, where the railway line ascends the central plateau of Mexico, 2300 meters, October 5, 1924; slopes of San Antonio River, Cordoba, Veracruz, swept luxuriant weeds, October 19, 1924; swept shrubs and weeds from the train between Coscomatepec and Tomatlan, Veracruz, 1500 meters, November 30, 1924; swept from a lawn in Manzanillo, northeast of Cordoba, 1000 meters, December 2, 1924; Cauatla, Morelos, on light, September 2, 1937, R. Ruiz Soto collector; Rancho Palmira near Cuernavaca, Morelos, swept from luxuriant weeds, June 5, 1938; Ayotzinapa, Guerrero, between Chilpancingo and Tixtla swept from weeds and with flies swarming over a manure pile January 11, 14, 15 and 19, 1941; Mexico-Toluca road, km. 20, November 24, 1938, J. S. Caldwell; Concepcion, Guatemala, 1400 feet, C. N. Ainslie.

Host: Unknown.



Type in Crawford Collection, United States National Museum (a mutilated female), Oaxaca, August 10, 1910.

**Kuwayama longipennis** n. sp.

Figs. 72, 73, 74.

Length to tip of folded wings 3.25–3.50 mm.

**Color:** General body color tawny. Abdomen brown dorsally, light ventrally.

**Structure:** Body slender. Head nearly as broad as thorax. Vertex deeply impressed discally. Genae roundly swollen. Antennae slender, almost twice as long as width of head. Eyes far forward on head. Thorax strongly arched. Pronotum small, not depressed below plane of vertex. Forewings large, slender, angulate, 3 times as long as wide; Rs slightly sinuate, marginal cells large, equal. Hind wings large, 0.66 as long as forewings. Metatibiae with very large basal spur, 1 outer and 2 inner apical spines. Metacoxae moderately produced anteriorly.

Male genitalia small. Proctiger straight, narrowed apically. Forceps nearly as long as proctiger; in lateral view stout, straight, slightly swollen midway, narrowed to slender, forward curving black tooth; in caudal view slender, straight, incurving black tooth apically. Female genital segment small, shorter than rest of abdomen; dorsal valve stout, blunt, straight; ventral valve shorter than dorsal, sharply turned up to acute apex.

**Holotype**, male **allotype**, female, swept from flowers of *Schinus molle*, Chapingo, D. F., May 19, 1924.

Holotype in author's collection, allotype in Dampf's collection.

Host: Unknown.

Genus **Leuronota** Crawford

1914 **Leuronota** Crawford, U. S. Nat. Mus., Bull. 85: 67.

Head narrower than thorax, scarcely or not at all deflexed. Genae produced as conical processes, porrect. Antennae slender, long. Eyes hemispherical. Thorax scarcely arched. Pronotum flat, long, on same plane as vertex and prescutum, produced cephalad medially as blunt epiphysis, very narrow. Proepisterna very large, visible in dorsal view as prominent quadrate lateral processes. Prescutum flat with small medial anterior epiphysis. Mesopleurites strongly developed. Forewings long, slender, angulate, venation triozine. Legs long. Metatibiae with basal spur, 1 outer and 2 or 3 inner apical spines.

**Orthotype:** **Leuronota maculata** (Crawford)

This genus is quite distinct from the other genera of Triozinae found in the Americas. Members are known to occur in the Orient and Pacific Islands as well as both North and South America. In addition to the two species treated here, which have been found in Mexico, two others are known from Central America; **L. acutipennis** Crawford, described from Nicaragua and **L. magna** Laing from Panama.

## KEY TO SPECIES OF LEURONOTA

1. Forewings with variable maculation formed of small brown dots **maculata**  
Forewings uniformly brown except for a pale area along costal border  
..... **michoacana**

**Leuronota maculata** (Crawford)

Figs. 75, 76, 77.

1910 **Trioza maculata** Crawford, Pom. Coll. Jour. Ent. 2: 230, 349.1911 **Allotrioza maculata** Crawford, Pom. Coll. Jour. Ent. 3: 444, 446.1914 **Leuronota maculata** Crawford, U. S. Nat. Mus., Bull. 85:68.1928 **Leuronota maculata** Ferris, Can. Ent. 60: 240.

Length to tip of folded wings 3.25 to 4 mm.

**Color:** General color dirty white to brown, abdomen darker. Forewings with numerous small brown dots forming maculae as figured, amount of maculation quite variable.

**Structure:** Entire body more or less pubescent. Head narrower than thorax, not deflexed. Vertex almost plane, discal foveae more or less prominent. Genal processes short, blunt, divergent apically, about 0.5 as long as vertex, somewhat deflexed from plane of vertex. Antennae slender, 2.5 times as long as width of head. Clypeus large, visible in cephalic view. Thorax scarcely arched. Pronotum flat, above plane of vertex, acute epiphysis medially on anterior margin fitting into excavate posterior margin of vertex. Prescutum broad, lateral margins long. Forewings slender, 3 times as long as wide or slightly over, roundly angulate; Rs straight then arched to costal margin, cubital cell larger than medial. Metatibiae with 1 outer and 3 inner apical spines.

Male proctiger of medium length, rather stout, straight, anal pore opening antero-dorsally. Forceps very short; in lateral view broad, produced dorso-cephalically as long acute lobes; in dorso-caudal view broad, flattened, arched to black-tipped apices. Female genital segment 0.5 as long as rest of abdomen, thick dorso-ventrally; dorsal valve somewhat hoodshaped, exceeding ventral, ventral margin of latter straight for about 0.5 its length then sharply upturned to acute apex.

One specimen, female, Monterey, Nuevo Leon, November 25, 1909, F. C. Bishopp is in the U. S. National Museum. It has also been recorded from Sihuatenejo, Guerrero by Ferris, both nymphs and adults occurring on **Celtis iguanea**.

Host: **Celtis** spp.

Type in Crawford Collection, United States National Museum.

**Leuronota michoacana** Ferris

Figs. 78, 79.

1928 **Leuronota michoacana** Ferris, Can. Ent. 60:241.

Length to tip of folded wings 4 mm.

**Color:** General color dark brown with pale markings on head and thorax and pale area along costal border of forewing.

**Structure:** Head narrower than thorax, only slightly deflexed. Genal processes slightly below plane of vertex, acute and quite divergent, about 0.5 as long as vertex. Antennae slender, 2.5 times as long as width of head. Thorax flat. Pronotum flat, not at all depressed, with small median epiphysis. Forewings 3 times as long as wide, straight, bluntly pointed. Hind wings with venation well developed, entire surface beset with minute points, 0.75 as long as forewings. Metatibiae with serrate basal carina, 1 outer and 3 inner apical spines.

Male proctiger straight, truncate apically. Forceps shorter than proctiger; in lateral view straight for short distance at base then curved cephalad and dorsad, tapering to blunt tip. Female genital segment short and blunt; dorsal valve longer than ventral, downturned to rounded apex, circum-anal pore ring of double row of pores; ventral valve upturned, acute.

Known only from the type series which was collected at Chinicuila, Michoacan, February 1926 by G. F. Ferris. The adults were taken in company with nymphs both of which Ferris has described and figured in detail. I have examined some of this type material through the courtesy of G. F. Ferris.

Host: Unknown.

#### Genus *Metatrioza*

1939 *Metatrioza* Tuthill, Bull. Brooklyn Ent. Soc. 34: 53.

Head large, at least as broad as thorax. Vertex with sharp anterior and posterior margins, strongly concave between eyes, medial suture prominent. Genal processes not contiguous. Clypeus very small. Dorsum of thorax rather broad and flat, pronotum not depressed below head. Forewings with triozone venation, cubital cell very large. Metatibiae with large basal spur, 1 outer and 2 inner apical spines.

Orthotype: *Metatrioza pubescens* Tuthill.

Although not recorded from Mexico this genus is included because it undoubtedly occurs in the northern portion of the country. The only described species is known only from the type series which was collected in southern Arizona, in the Baboquivari Mountains.

#### Genus *Ceropsylla* Riley

1885 *Ceropsylla* Riley, Proc. Biol. Soc. Wash. 2:76.

Head narrower than thorax. Vertex somewhat rounded or flat with deep sulci, overhanging median ocellus, portion bearing lateral ocelli raised. Genae produced as short blunt processes extending somewhat forward, a second small rounded processes next eye, below antennal insertion. Antennae slender, long, arising close together and far down on genae. Eyes hemispherical, very large. Thorax strongly arched. Pronotum very short, vertical, depressed below vertex and prescutum. Proepisternum produced laterad, plate-like. Prescutum strongly arched. Mesopleurites strongly developed, episternum very large, swollen. Forewings large, membranous, angulate apically, basal vein very long, parallel to costa, cubitus branching separately, R short to obsolete, R<sub>1</sub> rather long, R<sub>s</sub> short, cubital cell larger than medial, no pterostigma.

Hind wings much shorter than forewings. Metatibiae with basal spur, 1 outer and 2 inner apical spines.

Haplotype: *Ceropsylla sideroxyli* Riley

The characters of the head and forewing will serve to distinguish this from the other genera of *Triozinae*. The location of the antennal insertion is quite distinctive, being far down on the genal processes. The venation of the forewing is distinct. The very long basal vein and the separate branching of cubitus from the basal vein are the most striking features. The branching of the basal vein does not approximate a trichotomous condition, the common stem of R and M being quite long.

#### KEY TO THE SPECIES OF CEROPSYLLA

1. Vertex with deep discal sulci, female genital segment longer than rest of abdomen ..... 2  
    Vertex without deep discal sulci, female genital segment shorter than rest of abdomen ..... *sideroxyli*
2. Length to tip of folded wings 2.25 mm; vertex uniformly black ..... *discrepans*  
    Length to tip of folded wings 3.25 mm; vertex light except discal sulci ..... *pulchra*

#### *Ceropsylla sideroxyli* Riley

Figs. 80, 81, 82.

1885 *Ceropsylla sideroxyli* Riley, Proc. Biol. Soc. Wash. 2:76.

1928 *Ceropsylla sideroxyli* Ferris, Can. Ent. 60:245.

Length to tip of folded wings 4 mm.

**Color:** General color green to yellow. Front of head between antennae, including genal processes, prescutum and scutum dark brown. Antennae dark. Wings hyaline.

**Structure:** Dorsum with short pubescence. Head small, narrower than thorax. Vertex very small, rounded downward both posteriorly and anteriorly, except over median ocellus. Eyes very large. Lateral ocelli on raised prominences, far forward, almost midway of eyes. Genae separated medially to above bases of antennae, below antennae genae produced into short, bluntly rounded processes. Antennae 1.8 times as long as width of head, arising far down on genae and close together. Thorax strongly arched. Pronotum depressed below plane of vertex. Prescutum large, rounded anteriorly, as long as wide. Forewings long, slender, acutely angled, 3 times as long as wide; basal vein very long, R and M with common stem, R obsolete, Rs very short, straight, cubital cell larger than medial. Metatibiae with small basal spur, 1 outer and 2 inner apical spines. Metacoxae with posterior spur of moderate size, anteriorly somewhat produced but not spiniform.

Male proctiger produced caudad as broad rounded lobe. Forceps shorter than proctiger; in lateral view slender, slightly curved cephalad, short, slender, curved process near base on anterior margin; in caudal view slender to

spatulate apices. Female genital segment longer than preceding sternite; ventral valve very broad, slightly sinuate to medial, broad, truncate tooth; dorsal valve exceeding ventral, narrower, blunt.

Originally described from Florida, United States this species has previously been recorded from Zacatula, Guerrero, near the mouth of the Balsas River by Ferris. This record was based upon nymphs taken from "*Sideroxylon* sp." One specimen is at hand from Esmerelda, Chiapas, collected November 18, 1930.

Type no. 695 United States National Museum.

Host: *Sideroxylon foetidissimum* Jacq.

***Ceropsylla discrepans* n. sp.**

Figs. 83, 84.

Length to tip of folded wings 2.25 mm.

**Color:** General color dark brown. Legs white. Wings hyaline. Abdomen yellow ventrad.

**Structure:** Head large, wider than thorax. Caudal margin of vertex strongly arcuate, 2 deep discal sulci, median suture prominent, bulging anteriorly over antennal insertions. Genae produced as short, blunt contiguous lobes. Eyes very large. (Antennae missing from specimen at hand). Thorax well arched, dorsum punctate. Pronotum strongly depressed, almost invisible in dorsal view. Prescutum bluntly rounded anteriorly. Forewings slender basally, much broader toward apex, 2.25 times as long as wide, very obtusely angular;  $R + M + Cu$  long,  $R$  and  $M$  with common petiole,  $Rs$  short, curved to costa, cubital cell larger than medial. Hind wings 0.66 as long as forewings. Legs long, slender. Metatibiae with very small serrate carina basally, 1 outer and 2 inner apical spines. Metacoxae produced anteriorly as raised plates.

Female genital segment longer than rest of abdomen, straight, evenly narrowed from base, valves almost equal, both sharp apically.

Described from one female taken at a light by Dr. R. Nettel at Finca "La Fortuna", Chiapas, October 25, 1938. This holotypic specimen is in Dampf's collection.

Host: Unknown

***Ceropsylla pulchra* n. sp.**

Figs. 85, 86

Length to tip of folded wings 3.25 mm.

**Color:** General color fulvus with brown markings, most sclerites brown margined. Vertex light yellow with discal sulci dark brown. Legs nearly white. Wings hyaline.

**Structure:** Head wider than thorax. Vertex strongly concave caudad, discal sulci prominent, overhanging antennal insertions. Genae produced as short, blunt, contiguous processes. Eyes very large. (Antennae lacking from specimen at hand). Thorax moderately arched. Pronotum very strongly de-

pressed. Prescutum broadly rounded anteriorly. Forewings short, 2.25 times as long as wide, very obtusely angular; basal vein long, R and M with common petiole, Rs moderately long, curved to costa, cubital cell larger than medial. Hind wings large, 0.7 as long as forewings. Metatibiae with very small serrate basal carina, 1 outer and 2 inner apical spines.

Female genital segment longer than rest of abdomen, very slender, valves equal, attenuate to sharp apices.

This species resembles *C. discrepans* very much but differs from it in the larger size, color, and the much more slender and attenuate female genital segment. It is quite probable that the males will show additional differences when they become known.

Described from a unique female collected at light by J. Parra at El Palenque, Chiapas, in virgin mountain forest, March 5, 1931. Type in Dampf's collection.

Host: Unknown.

### Genus *Myrmecephala* n. g.

Head narrower than thorax, short. Vertex short, smoothly rounded to sides and to genae, medial suture distinct. Genae produced as large bluntly conical processes longer than vertex. Eyes small, hemispherical. Antennae slender, moderately long, pronotum vertical, scutum flat. Forewings slender, venation trioizine, basal vein long, Rs very short, medial cell larger than cubital. Metatibiae with 1 outer and 3 inner apical spines.

Generotype: *Myrmecephala prima* n. sp.

The appearance of the head of the species on which this genus is based is quite suggestive of the head of an ant. The name is derived from the Greek nouns *myrmex*—ant and *cephala*—head. The smooth bulging vertex continuous with the genae will serve to distinguish it from the other genera of Triozinae. This genus shows very strong affinities to *Triozoida* but the armature of the apex of the metatibiae is typical trioizine and but very slightly developed.

### EXPLANATION OF PLATE I

#### FIG.

1. *Trioza magnoliae*—female cauda.
2. *Trioza magnoliae*—forewing.
3. *Trioza magnoliae*—male cauda.
4. *Trioza bifurca*—female cauda.
5. *Trioza bifurca*—forewing.
6. *Trioza bifurca*—male cauda.
7. *Trioza minuta* var. *arizonae*—female cauda.
8. *Trioza minuta* var. *arizonae*—male cauda.
9. *Trioza minuta* var. *arizonae*—forewing.
10. *Trioza rubra*—female cauda.
11. *Trioza rubra*—male cauda.

#### FIG.

12. *Trioza rubra*—forewing.
13. *Trioza russellae*—male cauda.
14. *Trioza russellae*—female cauda.
15. *Trioza russellae*—forewing.
16. *Trioza anceps*—forewing.
17. *Trioza anceps*—female cauda.
18. *Trioza inusitata*—female cauda.
19. *Trioza inusitata*—forewing.
20. *Trioza bella*—forewing.
21. *Trioza bella*—male cauda.
22. *Trioza dampfi*—male cauda.
23. *Trioza dampfi*—female cauda.
24. *Trioza dampfi*—forewing.

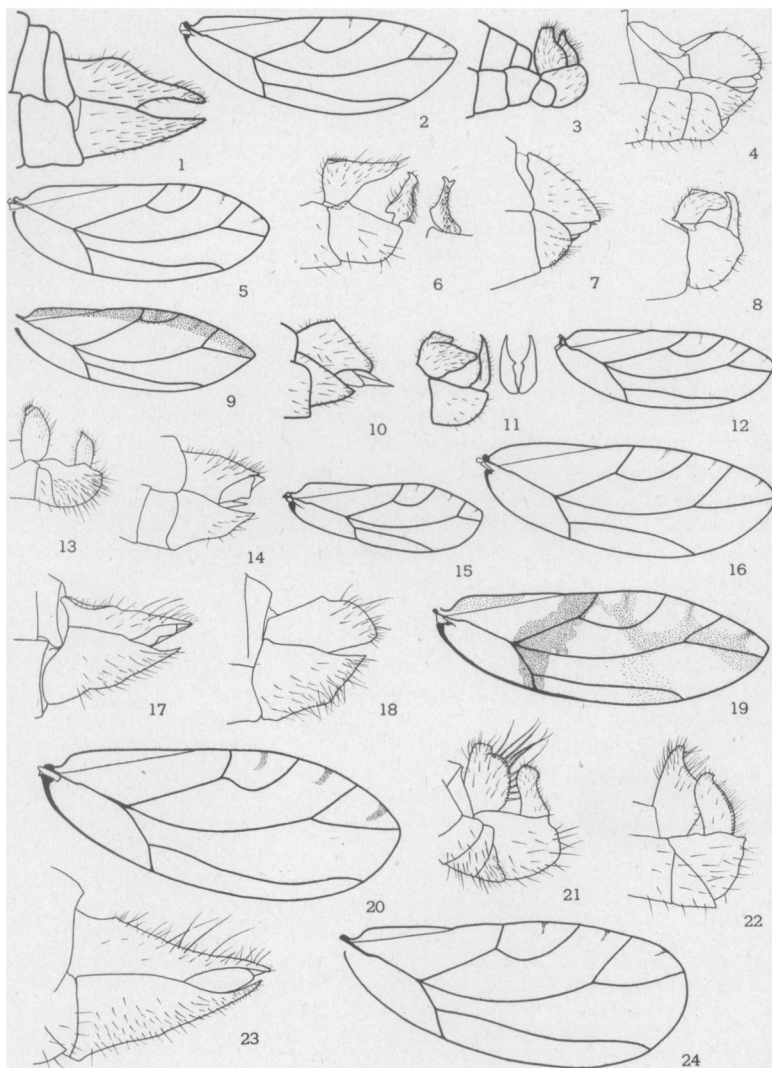


PLATE I

***Myrmecephala prima* n. sp.**

Figs. 87, 88, 89, 90.

Length to tip of folded wings 3.5 mm.

**Color:** Head, pro and mesothorax shining black. Metathorax, abdominal sternites, proximal segments of legs yellow. Abdominal tergites dark brown. Antennae white except 3 terminal segments black. Forewings hyaline except basal vein and R with bordering membrane dark brown, anal margin near base also embrowned. Hind wings hyaline.

**Structure:** Head small, vertex pubescent, short, caudal margin straight, without discal impressions, smoothly rounded to genae. Genae produced as large, straight, blunt processes, separate from base, longer than vertex in dorsal view, 0.5 as long as width of vertex. Clypeus small, not visible from front. Eyes small, hemispherical. Antennae slender, 3 times as long as width of head. Thorax strongly arched, sparsely pubescent, punctate. Pronotum short, very strongly depressed below vertex. Forewings acutely angulate, 3 times as wide as long, anal margin straight, costal margin evenly arcuate; basal vein long, furcation not quite trichotomous, Cu branching off somewhat before R and M, Rs short, arched to costa, not reaching furcation of M, medial cell slightly larger than cubital. Hind wings small, 0.6 as long as forewings. Metatibiae with serrate basal carina, 1 outer and 3 inner apical spines. Metacoxae raised anteriorly.

Male genitalia small, proctiger short, strongly produced caudad, with prominent apical epiphysis. Forceps shorter than proctiger, in lateral view stout, flaring to rounded apex; in caudal view slender, nearly straight; in dorsal view long, black margined, a small mesally projecting tooth at each end. Female genital segment 0.66 as long as rest of abdomen, straight; dorsal valve straight, acute; ventral valve shorter than dorsal, slender and up-turned apically.

**Holotype**, male, **allotype**, female, 2 male and 2 female paratypes collected at San Pedro de Montes de Oca, Costa Rica, by C. H. Ballou on December 17, 1933 and February 3, 1915, taken on *Ipomoea tiliacea* (Wild.), sweet potato and *Tabernaemontana bignoniiflora* Miers. One male paratype swept from flow-

## EXPLANATION OF PLATE II

## FIG.

25. *Trioza grandipennis*—female cauda.
26. *Trioza grandipennis*—forewing.
27. *Trioza grandipennis*—male cauda.
28. *Trioza nigriconus*—forewing.
29. *Trioza nigriconus*—male cauda.
30. *Trioza maritima*—forewing.
31. *Trioza maritima*—male cauda.
32. *Trioza maritima*—female cauda.
33. *Trioza collaris*—female cauda.
34. *Trioza collaris*—male cauda.
35. *Trioza collaris*—forewing.

## FIG.

36. *Trioza proximata*—male cauda.
37. *Trioza proximata*—female cauda.
38. *Trioza nigriscutum*—forewing.
39. *Trioza nigriscutum*—male cauda.
40. *Trioza longigenae*—forewing.
41. *Trioza psyllihabit*—male cauda.
42. *Trioza psyllihabit*—forewing.
43. *Trioza diospyri*—forewing.
44. *Trioza diospyri*—male cauda.
45. *Trioza diospyri*—female cauda.



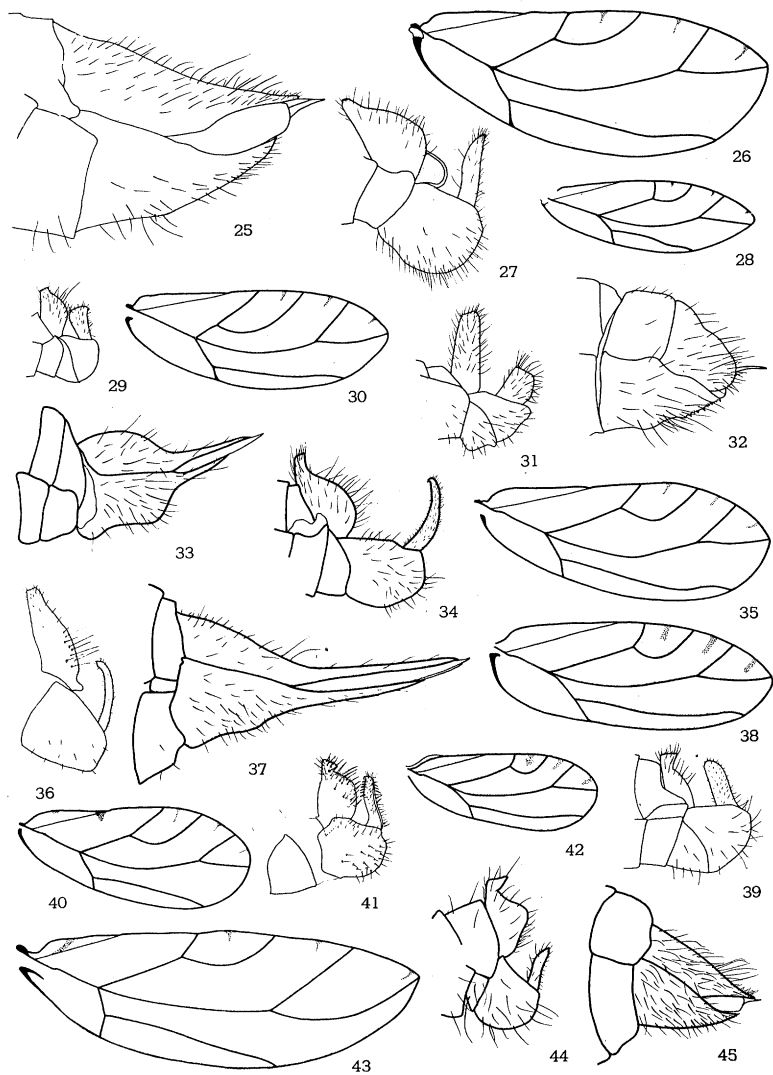


PLATE II

ering *Convolvulus* near the shore of the lake at Tuxpan near Iguala, Guerrero, Mexico, December 9, 1929, Alfonso Dampf.

Holotype, no. 56963 U. S. N. M., allotype and paratypes in United States National Museum, one pair in author's collection, Mexican specimen in Dampf's collection.

### Genus *Triozoida* Crawford

1911 *Triozoida* Crawford, Pom. Coll. Jour. Ent. 3: 491.

Head narrower than thorax. Vertex smooth, concave between eyes, somewhat bulging anteriorly over median ocellus, lateral ocelli on raised areas. Median ocellus visible only from front. Genae continuous with vertex, produced as large, stout, widely separated processes. Antennae moderately long, not over twice as long as width of head. Thorax broad, well arched. Forewings long, straight, acutely angled; branching of R, M and Cu from basal vein variable. Hind wings large. Legs short, stout. Metatibiae with 2 or 3 outer and 2 or 3 inner apical spines, variable.

Orthotype: *Triozoida johnsonii* Crawford.

Several characters serve to distinguish this genus from *Ceropsylla* to which it was referred by Crawford. Chief of these are the genae, the wings and the metatibiae. The genal processes are large and are widely separated whereas in *Ceropsylla* they are short and appressed. The venation of the forewings differs in that the branching of the basal vein is trichotomous or very nearly so, this character is quite variable but the common petiole of R and M or M and Cu is not as pronounced as in *Ceropsylla*. The presence of more than one spine on the outer margin of the apex of the metatibiae serves to distinguish this group from all of the other known genera of the Triozinae. These metatibial spines are large and stout.

### *Triozoida johnsonii* Crawford

Figs. 91, 92, 93.

1911 *Triozoida johnsonii* Crawford, Pom. Coll. Jour. Ent. 3: 492.

1914 *Ceropsylla johnsonii* Crawford, U. S. Nat. Mus., Bull. 85: 103.

### EXPLANATION OF PLATE III

#### FIG.

46. *Triozia albifrons*—female cauda.
47. *Triozia albifrons*—forewing.
48. *Triozia albifrons*—male cauda.
49. *Triozia incidata*—forewing.
50. *Triozia incidata*—female cauda.
51. *Triozia incidata*—male cauda.
52. *Triozia mexicana*—forewing.
53. *Triozia mexicana*—male cauda.
54. *Triozia mexicana*—female cauda.
55. *Triozia mexicana minor*—female cauda.
56. *Triozia mexicana minor*—male cauda.
57. *Paratriozia cockerelli*—forewing.
58. *Paratriozia cockerelli*—male cauda.

#### FIG.

59. *Paratriozia cockerelli*—female cauda.
60. *Paratriozia dubia*—forewing.
61. *Paratriozia dubia*—female cauda.
62. *Paratriozia dubia*—male cauda.
63. *Kuwayama medicaginis*—male cauda.
64. *Kuwayama medicaginis*—forewing.
65. *Kuwayama medicaginis*—female cauda.
66. *Kuwayama sincera*—female cauda.
67. *Kuwayama sincera*—male cauda.
68. *Kuwayama sincera*—forewing.
69. *Kuwayama oaxacensis*—female cauda.
70. *Kuwayama oaxacensis*—forewing.
71. *Kuwayama oaxacensis*—male cauda.

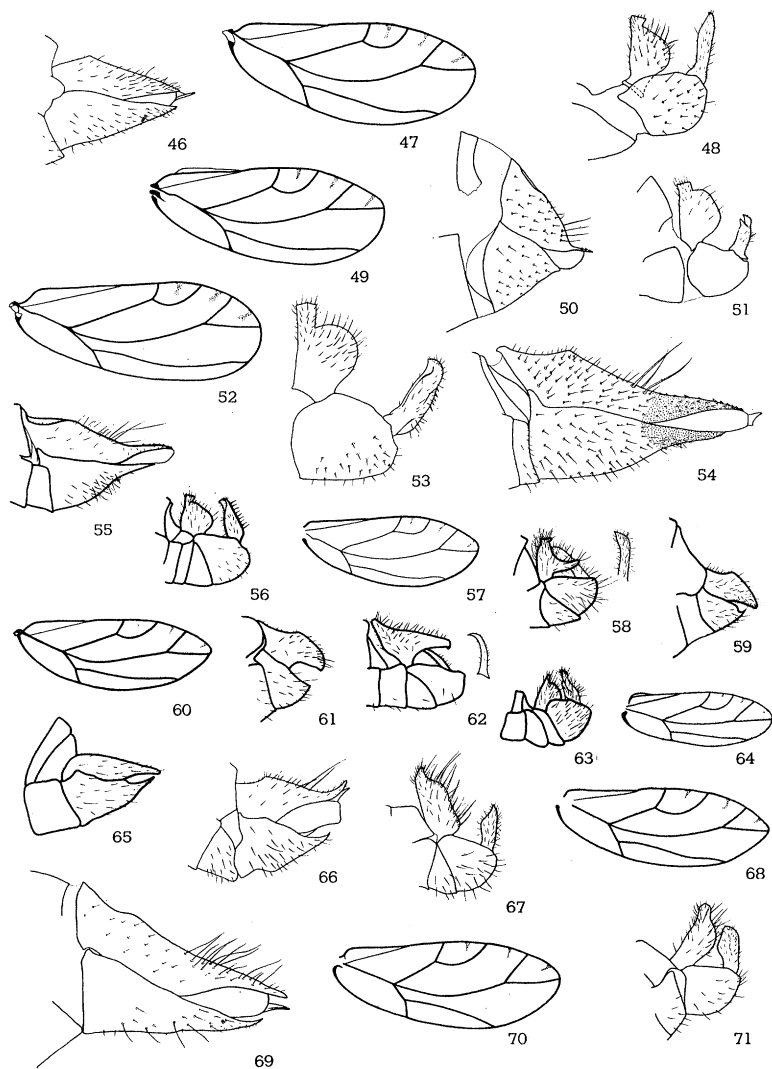


PLATE III

1925 *Ceropsylla johnsonii* Crawford, Broteria, Ser. Zool., 22:64.

1941 *Ceropsylla johnsonii* Caldwell, Ohio Jour. Sci., 41:422.

Length to tip of folded wings 4.5 mm.

**Color:** General color light brown. Head dark brown to black including antennae and clypeus. Thorax yellowish ventrad. Pro and meso tibiae and tarsi dark. Forewings hyaline except narrow brown margin along basal vein and R to its furcation.. Hind wings hyaline.

**Structure:** Head narrower than thorax. Vertex pubescent, strongly concave between eyes, protruding mesally over median ocellus, medial suture prominent, lateral ocelli on raised areas. Eyes large. Genae produced as large blunt processes, separate from base, 0.6 as long as dorsal aspect of vertex. Antennae slender, arising far down on genae, twice as long as width of head. Thorax strongly arched, broad, dorsum sparsely pubescent. Pronotum long, vertical. Mesopleurites strong developed. Forewings straight, tapered to acute apex, 3 times as long as wide; basal vein short, Rs moderately long, somewhat sinuate, medial cell much larger than cubital. Hind wings 0.6 as long as forewings. Legs short, stout. Metatibiae with basal spur, 2 or 3 outer and 3 inner apical spines. Metacoxae produced anteriorly, somewhat raised.

"Male—Forceps almost as long as anal valve (proctiger), simple, converging uniformly from base to tip, arcuate, toothed at apex, rather densely pubescent; anal valve with a short, subacute lobate process caudad from sub-apical portion of axis, pubescent", Crawford. Female genital segment shorter than rest of abdomen, valves equal; dorsal valve straight, blunt; ventral valve upturned to sharp apex.

Originally described from one male collected at Belize, British Honduras this species has been recorded from Valles, San Luis Potosi, by Caldwell. One female in the material at hand was collected at Finca Vergel, Chiapas, May 28, 1935 by Alfonso Dampf. It has been compared with the type in the United States National Museum. Crawford assigned a female from Sao Paulo, Brazil to this species but without description of the genitalia.

Host: Unknown.

#### EXPLANATION OF PLATE IV

##### FIG.

72. *Kuwayama longipennis*—female cauda.
73. *Kuwayama longipennis*—male cauda.
74. *Kuwayama longipennis*—forewing.
75. *Leuronota maculata*—male cauda.
76. *Leuronota maculata*—female cauda.
77. *Leuronota maculata*—forewing.
78. *Leuronota michoacana*—female cauda.
79. *Leuronota michoacana*—forewing.
80. *Ceropsylla sideroxyli*—forewing.
81. *Ceropsylla sideroxyli*—female cauda.
82. *Ceropsylla sideroxyli*—cephalic aspect of head.
83. *Ceropsylla discrepans*—female cauda.

##### FIG.

84. *Ceropsylla discrepans*—forewing.
85. *Ceropsylla pulchra*—female cauda.
86. *Ceropsylla pulchra*—forewing.
87. *Myrmecephala prima*—cephalic aspect of head.
88. *Myrmecephala prima*—male cauda.
89. *Myrmecephala prima*—forewing.
90. *Myrmecephala prima*—female cauda.
91. *Triozoida johnsonii*—female cauda.
92. *Triozoida johnsonii*—forewing.
93. *Triozoida johnsonii*—cephalic aspect of head.

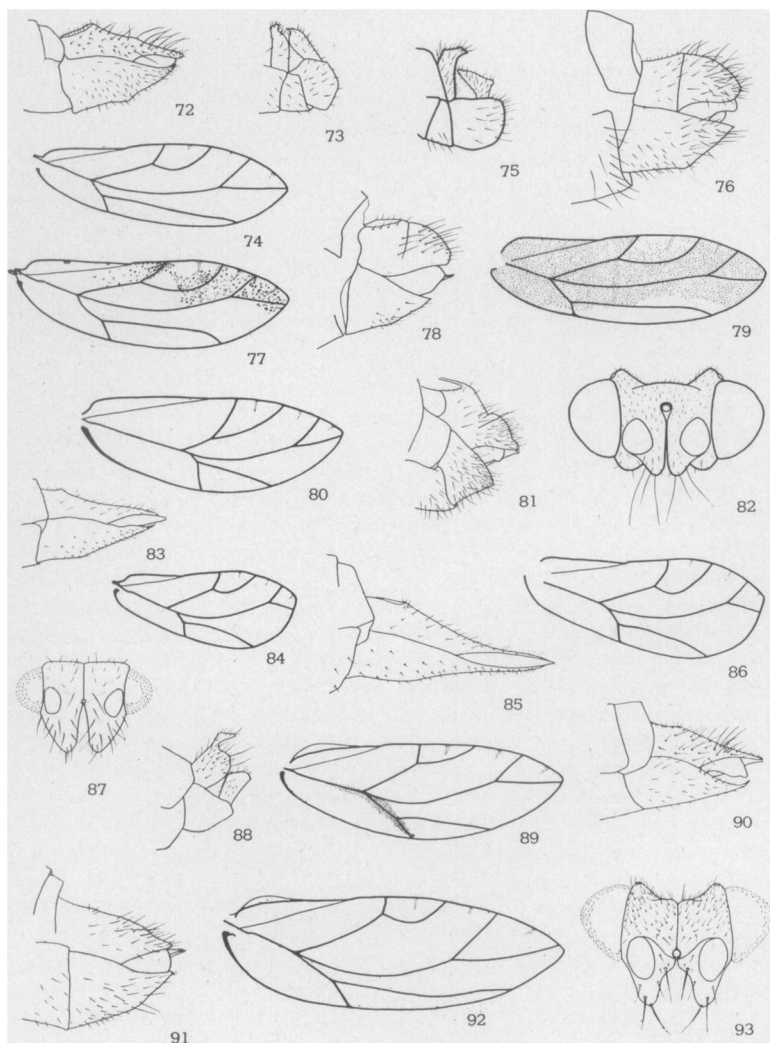


PLATE IV