

THE AMERICAN SPECIES OF TRIXOSCELIDÆ*

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Rondani (1856) erected the genus *Trixoscelis* for the European *Geomyza obscurella* Fallen, but his citation was overlooked for many years. Frey (1921) proposed the family Trixoscelidæ as differing from the Helomyzidæ in that the fronto-orbits are not shortened but extend to the suture. This family was accepted by Hendel (1928). Hendel was the first (1911) to report the occurrence of *Trixoscelis* in America, although previously species had been described by Coquilett (1902) and Aldrich (1908) under other generic names.

In 1913, I published a synopsis of the seven American species recorded up to that date. Since that time I have found so many new species as to warrant the present study. Although but a single genus (*Trixoscelis*) is found in Europe, with *Psiloplagia* in the Transcaspian region and *Diplogeomyza* and *Allophylopsis* in the Australian region, in America there are four genera. One of these, *Neossos*, is found in the nests of song birds around Washington, D. C., another, *Spilochroa*, occurs in the West Indies and Florida. All the genera are found in the Eastern part of America. Nothing is known of their habits, other than that the species are found in grassy spots, in woodlands, and in the desert. The European species have been written up by Loew (1865) and by Czerny (1903 and 1909) as *Geomyza*, and Collin (1943) has published the British species.

The Trixoscelidæ (emended by Hendel and by Collin to Trichoscelidæ) are differentiated from the other Muscidæ acalypterata by the following combination of characters: Antennæ two-jointed, the arista microscopically pubescent; palpi long and narrow, always yellow; two fronto-orbital bristles, the orbits extending to the suture; five dorsocentrals (in *Neossos* four), one mesopleural, two sternopleural, propleural present, acrostichals variable; wings with subcosta close to first vein, costa broken at end of subcosta and provided with more or less evident spines; anal vein not reaching margin; halteres pale yellow.

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KEY TO THE AMERICAN GENERA OF *TRIXOSCELIDÆ*.

1. Yellow species with all bristles yellow; back of cheeks equal to or one-half the eye-height. *Zagonia* Coquillett.
Usually blackish in ground-color, the bristles all black; cheeks usually one-half the eye-height or less. 2.
2. Mesopleura with a distinct bristle and some adjacent setulæ; two sternopleurals; acrostichals in two or four series; five uniform strong dorsocentrals; anterior fronto-orbital nearer the antennæ. 3.
Mesopleura without bristle or setulæ; only posterior sternopleural developed; acrostichals in six or eight rows; anterior pair of dorsocentrals underdeveloped; fronto-orbitals on posterior half of front.
Neossos Malloch
3. Cheeks one-eighth the eye-height; wings largely blackened but with many hyaline spots, or hyaline with brownish spots; acrostichals in four rows. *Spilochroa* Johnson
Cheeks one-eighth to two-thirds the eye-height; if wings are more or less clouded the dark marks are longitudinal. *Trixoscelis* Rondani

NEOSSUS Malloch

Malloch, 1927, p. 90. Curran, 1934, North Am. Dipt. p. 331 and 372.

Anterior fronto-orbital bent outwardly; eyes large, round; lateral setulæ of thorax abundant; abdomen shining; wings hyaline, costal setulæ not longer than diameter of costa.

KEY TO THE SPECIES OF *NEOSSUS*.

- Front nearly square, furnished with scattered setulæ; face shallowly concave; antennæ luteous; thorax fuscous, pleuræ testaceous; legs testaceous. (Md.) *marylandica* Malloch
Front narrower than long, bare; the black antennæ sunken; thorax entirely black; legs dark fuscous. (Cal.) *californica*. n. sp.

Neossos marylandica Malloch

Malloch, 1927, p. 90.

This species was reared from puparia found in the nests of purple martin, wren, bluebird, crested flycatcher and starling.

Neossos californica, new species

FEMALE.—Length 2 mm. Front rufous below, the orbits becoming black at the bristles and merging with the occiput, face deeply sunken, last antennal joint large and round, the arista black; cheeks one-sixth the eye-height, with a row of six strong setulæ. Thorax wholly black, subshining, the abdomen shining black and with small bristles. Legs fuscous, the front

coxæ. Wings hyaline, the veins yellowish, costal setulæ minute and sparse, anterior crossvein at three-fifths the discal cell, posterior crossvein equal to last section of fifth vein.

Holotype: Corona del Mar, California, 16 July 1945.

ZAGONIA Coquillett

Coquillett, 1904, Invert. Pacif. 27. Aldrich, 1910, Can. Ent. XL, 100. Melander, 1913, 297.

Synonym. *Silago*, part. Aldrich, Trans. Am. Ent. Soc. xxxiv. 98 (1908).

The yellow bristles and hairs of the body and legs are the only distinctive characters. The entire insects are yellow, the dark arista and costal setulæ being the only parts not yellow.

KEY TO THE SPECIES OF ZAGONIA.

Cheeks equal to diameter of eye, deeper behind, face receding; last joint of antennæ of female black, of male yellow. (Wash., Ida., Oreg., Calif.)

flava Coquillett

Cheeks one-half the diameter of the eye, scarcely deeper behind, face nearly vertical; antennæ of both sexes yellow. (Wash.) *flavicornis*. n. sp.

Zagonia flava Coquillett

Coquillett, 1904. Inv. Pacif. 27. Melander, 1913, p. 297. Curran, 1934, No. Am. Dipt. 372, f. 3, 4.

Synonym. *Silago oregona* Aldrich, 1908, p. 99.

Length 3 mm. Front up-heaved above antennæ, the anterior fronto-orbital closer to the posterior than to the lunule, one-half the length of the posterior; a single row of occipitals forming an S-shaped line; face receding; cheeks wide, much deeper behind, equal to diameter of the small horizontal eye; hind metatarsi about as thick as the tibiæ, the following joint more than two-thirds as long as the metatarsus; the black setulæ of the costa longer than the width of the costa.

Eighty-five specimens. Idaho, opposite Grande Ronde River, May. Washington, Wawawai, Almota, Alpowa, Prosser, Dungeness and Mount Vernon, May and June. Oregon, Corvallis, June. California, Riverside, Palm Springs, April and May.

Zagonia flavicornis, new species

Length 2.5 mm. Entirely flavous, the arista except base and the minute costal setulæ alone black. Front not bulbose, the anterior fronto-orbital bristle closer to the frontal suture than to the posterior, face not receding, the cheeks about half the diameter of the rounded eye; a few setulæ near

the row of occipital setulæ below. Hind metatarsi slender, twice as long as the following joint. Wings subhyaline, with flavous tinge, veins yellow, anterior crossvein at middle of discal cell, posterior crossvein one-fourth longer than the last section of fifth vein. The dorsal setæ are long and yellow.

Sixteen specimens: Omak, 29 May, 1916, and Pullman, 4 June, 1922, Washington.

SPILOCHROA Williston

Williston, 1907, Jour. N. Y. Ent. Soc. XV, 2. Melander, 1913, t.c. XXI, 284.

Similar to *Trixoscelis*, but the wings reticulate with hyaline spots on a darkened ground.

KEY TO THE SPECIES OF *SPILOCHROA*.

- Thorax rufous, some marked darker spots at bases of bristles, abdomen marked with gray at base and brown with gray spots apically; wings mostly brown. (Jamaica, Fla.) *ornata* Johnson
 Thorax blackish, unspotted, abdomen black, dorsum gray separated by a median black line; legs fuscous; wings mostly hyaline. (N. Mex.) *punctipennis* Melander

Spilochroa ornata Johnson

Johnson, 1895, p. 306 (*Heterochroa*). Czerny, 1903, Wien. ent. Ztg. XXII. 97 (*Peratochætus*). Williston, 1908, Manual, 3 ed., p. 297, f. 3, 4. Melander, 1913, p. 288.

Head, antennæ, thorax and legs rufo-testaceous, abdomen spotted with gray on each side of middle line and with smaller lateral spots; wings heavily infumated, marked with numerous white spots.

Jamaica; Drayton's Island, Florida.

Spilochroa punctipennis Melander

Melander, 1913, Psyche, XX, 167.

Upper parts of head blackish, thorax black, pleuræ fuscous, abdomen black, the dorsum cinereous interrupted by a median line; wings more largely hyaline, the dark marks less intense and more confluent than in *ornata*.

New Mexico; Pecos, July 26; Las Vegas Hot Springs, August.

TRIXOSCELIS Rondani

Rondani, 1856, Gen. ital. ordinis dipterorum, 134. Melander, 1913, p. 296. Collin, 1943, p. 235.

Synonym. *Geomyza* Loew, 1865, pp. 14-25. Czerny, 1903, pp. 123-127; 1909, x p. 281.

Synonym. *Parodinia* Coquillett, 1902, p. 186. Malloch, 1913, p. 274.

Synonym. *Siligo*, Aldrich in part, 1908, p. 98.

Two presutural and one postsutural dorsocentrals; antennæ with the last joint round to elliptical; cheeks variable, ranging from one-eighth to one-half the head-weight; wings hyaline or clouded.

TABLE OF THE AMERICAN SPECIES OF TRIXOSCELIS.

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|--|----------------------------|
| 1. Wings more or less infumated, at least the costa darkened | 2. |
| Wings clear, or whitish, costa yellowish, not darker than the middle veins | 8 |
| 2. Abdomen shining black; antennæ mostly reddish; front legs brown; wings strongly infumated along veins and posterior crossvein. (Manitoba, Wash.) | <i>fumipennis</i> Melander |
| Abdomen more or less pollinose, at most subshining | 3. |
| 3. Both crossveins and costa at end of first vein marked with smoky tinge, marginal cell not infumated; notum with brownish tone, pleuræ and abdomen yellowish; legs all yellow; cheeks one-thirds the eye-height. (Ariz., Colo.) | <i>buccata</i> . n. sp. |
| Anterior crossvein not clouded, marginal cell darker than submarginal; cheeks narrower | 4. |
| 4. Front legs black; antennæ mostly yellow; markings of wing strong, tips of third and fourth veins darkened, posterior crossvein clouded, equal to last section of fifth vein; thorax dark cinereous, acrostichals in four rows; proboscis black. (Cal.) | <i>signifera</i> . n. sp. |
| Legs yellowish, at most front femora or tarsi darkened; antennæ mostly black including base; proboscis yellowish; pollen of thorax somewhat yellowish in tone | 5. |
| 5. Infumation of wing relatively strong along veins and posterior crossvein; tarsi yellowish; posterior crossvein not shorter than last section of fifth vein | 6. |
| Infumation of wing suffused, posterior crossvein not clouded, shorter than last section of fifth vein; pollen of thorax with yellowish tone, not vittate; pygidium dark testaceous to black; front tarsi of female darkened. (Wash., Calif.) | <i>suffusa</i> . n. sp. |
| 6. Veins around anterior crossvein pale, posterior crossvein equal to last section of fifth vein, discal cell at end equal to first posterior cell before it; notum pale yellowish gray, with weak brown vittæ on dorso-central rows; pygidium yellow; legs all yellow. (Calif.) | <i>pygochroa</i> . n. sp. |
| All veins blackish except at base, posterior crossvein longer than last section of fifth vein, discal cell at end wider than first posterior cell before it; pygidium darker | 7 |

7. Notum with five brown vittæ; front brown except the gray orbits, costa blackish from base; front femora infuscated. (Calif.) **deserta**. n. sp.
 Notum cinereous, evittate; front anteriorly flavous; base of costa and of veins pale; legs yellow. (Calif.) **mohavea**. n. sp.
8. All femora and coxæ black 9.
 Coxæ and at least posterior femora largely or wholly yellowish, at least not black 10.
9. Abdomen polished black; face all whitish; front tibiæ and tarsi black; acrostichals scattered and sparse. (Calif.) **nitidiventris**. n. sp.
 Abdomen cinereous; middle of face dark; all tibiæ and tarsi yellow; middle rows of achrostichals very distinct. (Calif.) *litorea* Aldrich
10. Front femora more or less black or brown 11.
 All legs light yellow, rarely the front femora somewhat darkened 15.
11. Thorax vittate with brownish, sometimes very faint; cheeks one-sixth the eye-height 12.
 Thorax showing no trace of brown vittæ 14.
12. A median vitta in addition to the pair on the dorso-central rows; acrostichals biseriate, weak, precutellars undeveloped; desert species. (Ariz., Mex., Calif.) **triplex**. n. sp.
 Only two vittæ inside the dorsocentral rows; acrostichals in four irregular rows 13.
13. Sternopleura shining, upper pleuræ with yellow pollen; abdomen somewhat shining; third and fourth veins slightly converging; last antennal joint distinctly longer than deep, mostly yellow; precutellar bristles strong. (Ariz.) *claripennis* Malloch
 Sternopleura cinereous, upper pleuræ with brown pollen; abdomen cinereous; third and fourth veins distally parallel; last antennal joint round, blackish except lower edge; precutellars not developed. (Ariz., Utah, Calif.) **sagulata**. n. sp.
14. Tarsi slender; last antennal joint circular; male antennæ usually yellow and tibiæ yellow; female with last antennal joint darkened, but lighter below, and front tibiæ and tarsi black; cheeks one-sixth the eye-height; proboscis yellow; acrostichals weak, laterally straggling. (Western North America; Europe) *frontalis* Fallen
 Hind metatarsi of male more or less enlarged and darker than the tibiæ, of female slender and concolorous; last antennal joint oval, mostly uniformly blackish; cheeks one-third the eye-height; acrostichals strong, in four rows, the precutellar pair strong; last section of fifth vein shorter than posterior crossvein. (Wash., Oreg., Calif.) **tumida**. n. sp.
15. Last antennal joint black both inside and out, and rounded; four irregular rows of acrostichals; costa and veins yellow; posterior crossvein twice as long as last section of fifth vein. (Colo., Calif.) *cinerea* Coquillett
 Last antennal joint mostly or all yellow, at least not wholly black 16.

16. Abdomen wholly bright yellow, contrasting with the cinereous thorax; two rows of sparse acrostichals; antennæ pale yellow, the last joint round. (Calif.) *dimidiata*. n. sp.
 Abdomen blackish in ground color, at least not lighter and contrasting with the thorax 17.
17. Cheeks about one-eighth the eye-height; last antennal joint round 18.
 Cheeks about one-third to one-half the eye-height, increasing behind; some setulæ outside the dorsocentral rows 19.
18. Pleuræ and mesonotum gray-black; two rows of acrostichals; one row of occipitals; no setulæ outside the dorsocentral rows. (Calif.) *plebs*. n. sp.
 Pleuræ and mesonotum yellowish; about four rows of acrostichals; two or three rows of occipitals. (Wash.) *flavida*. n. sp.
19. Pleuræ and mesonotum gray-black; two or three rows of occipitals; last antennal joint round and yellow; two rows of acrostichals. (Colo., Wash., Calif.) *nuda* Coquillett.
 Pleuræ and mesonotum yellowish; last antennal joint one-half longer than deep, blackish except at extreme base; upper occiput yellowish; mesopleural bristle near middle of mesopleura. (Wash.) *flavens*. n. sp.

***Trixoscelis buccata*, new species**

MALE.—Length 1.9 mm. Light testaceous, front becoming dull luteous except the large ocellar triangle and the orbits; face, cheeks and mouthparts flavous; antennæ luteous, the outer joint marked with a distinct but small brown spot, arista blackish. Thorax heavily pollinose, the pleuræ lighter, four rows of scattered diminutive acrostichals; metanotum testaceous, abdomen appearing light on account of the pollen coating; pygidium large. Legs flavous. Wings narrow, costa beyond first vein and veins beyond base blackish, small clouds about the end of the first vein and the crossveins, posterior crossvein longer than the end of the fifth vein.

FEMALE.—Last antennal joint largely black.

Types: Sabino Canyon, near Tucson, Arizona, May 5, 1942. Eleven paratypes: Colorado; Manitou, June 16, 1940. Arizona; Baboquivari Mts., 27 April, 1947. California, Mojave Desert, Thorn, May 30, 1944; Upper Santa Ana River, San Bernardino County, July 29, 1948.

Trixoscelis cinerea Coquillett

Coquillett, 1902, p. 186 (*Parodinia*). Melander, 1913, p. 296. Aldrich, 1929, Proc. Ent. Soc. Wash. xxxi, p. 34.

Length 2.5 mm. Cheeks about one-half the eye-height or less, deeper behind, eyes higher than wide; outer antennal joint round, entirely black with black arista, basal joint of antennæ yellow; mouthparts yellowish. Thorax

cinereous on a black ground, acrostichals sparse, in four irregular rows. Abdomen black, cinereous, subshining. Legs wholly yellow. Wings hyaline, veins yellow.

I have taken the species at four places, all in San Bernardino County, in Southern California. Aldrich called attention that one of the types of *Leria nuda* from Colorado belonged to this species.

Trixoscelis claripennis Malloch

Malloch, 1913, p. 276 (*Parodinia*).

Synonym: *costalis* Coquillett, part, Jour. N. Y. Ent. Soc. X, p. 187 (1902) (*Parodinia*)

Length 2–2.5 mm. Opaque gray; acrostichals in four irregular rows, the prescutellar pair distinct; upper pleuræ with yellowish pollen; abdomen more or less shining; third and fourth veins slightly convergent.

Coquillett (1901) described *Rhinoessa costalis* from the Galapagos Islands (Proc. Wash. Ac. Sci. III. 378). The next year he transferred the species to *Parodinia* and reported its occurrence at several places in Arizona. Malloch noted that two species were involved, *costalis* with pictured wings, and the Arizona form with hyaline wings, and gave the name *claripennis* to the latter. In 1913 I examined Malloch's type and assigned it to the variable *Trixoscelis frontalis* (Psyche, 1913, p. 169). In this I was in error, for we now realize that there are many species of *Trixoscelis*. The two faint yellowish vittæ just within the dorsocentral rows and shining lower pleuræ distinguish *claripennis*. I have no specimens that agree with the description.

***Trixoscelis deserta*, new species**

MALE.—Length 2.5 mm. Front wholly fuscous except the whitish orbits, occiput light slaty gray; face and cheeks yellowish white, the cheeks one-sixth the height of the obliquely oval eyes; antennæ blackened, a small yellow spot at base of the black arista; proboscis testaceous, palpi pale yellow. Thorax nearly brown except the gray front and lateral margins, more intense and broadly under the bristles and the sparse acrostichals, scutellum brown the sides narrowly gray; upper pleuræ brown-gray; lower parts more gray, mesopleural bristle at upper three-fourths. Abdomen entirely black in ground color, gray-pollinose, less densely so along the middle. Legs deep flavous, the front femora lightly infuscated. Wings infumated, costa blackened from the humeral crossvein, the marginal cell infumated as also the posterior crossvein and the fifth vein, veins black from base of wing, costal setulæ small.

Holotype: Palm Canyon, Borrego Desert, California, May 2, 1945.

Trixoscelis dimidiata, new species

FEMALE.—Length 3 mm. Front including most of ocellar triangle and vertex wholly luteous, face and cheeks light yellow, eyes nearly round, vertically very slightly higher than wide, cheeks about one-third the eye, deeper behind, upper occiput cinereous yellow, lower occiput yellow; antennæ wholly yellow, the last joint nearly circular, arista brown with base yellow; mouth-parts all yellow. Thorax black cinereous; scutellum concolorous or apically yellowish, acrostichals long, sparse, biseriate, pleuræ cinereous with slight yellowish tone. Abdomen wholly bright yellow. Coxæ and legs completely yellow. Wings almost hyaline, veins yellow, costal setulæ strong, anterior crossvein just before middle of discal cell, posterior crossvein slightly longer than last section of fifth vein.

Four specimens: Riverside, May 5, 1935; Morro Bay, July 27, 1940; near Lucia, June 17, 1947, all in California. The strongly yellow abdomen readily distinguishes this species.

Trixoscelis flavens, new species

FEMALE.—Length 3 mm. Head, thorax and legs in general yellowish, the face, cheeks, lower occiput and legs paler. Front distinctly wider than long; cheeks nearly one-half the eye-height; at most two rows of occipital setulæ; antennæ luteous, the third joint blackish except at base of arista, inside fuscous; proboscis and palpi pale yellow. Abdomen blackish; scutellum pale yellow; pleuræ entirely yellow, mesonotal setulæ very small, about four rows of acrostichals. Legs wholly yellow. Wings hyaline with yellowish tinge, veins yellow, anterior crossvein at middle of discal cell, posterior crossvein longer than last section of fifth vein, first posterior cell wider than submarginal cell at anterior crossvein, costal setulæ large and abundant, about seven along costal cell.

Holotype: Lind, Washington, June 11, 1919 (F. W. Carlson).

Trixoscelis flavida, new species.

MALE.—Length 2 mm. Upper occiput to lower corner of eye fusco-testaceous, with three scattered rows of setulæ; front luteous, the anterior fronto-orbital placed well forward on the flavous orbits; cheeks very narrow, about one-eighth the height of the rotund eye; antennæ with outer joint luteous, slightly longer than deep, arista luteous on basal half; palpi and proboscis flavous. Mesonotum and metanotum fusco-testaceous, about four rows of acrostichals; scutellum yellow; pleuræ entirely yellow, mesopleural bristle located at upper angle of mesopleura; abdomen blackish, pygidium small, castaneous, shining. Legs wholly yellow. Wings hyaline, with yellowish tinge, veins yellow, anterior crossvein at middle of discal cell, posterior crossvein equal to last section of fifth vein, costal setulæ small, only two near apex of costal cell.

FEMALE.—Outer side of last antennal joint centrally with a pale fuscous spot leaving the edge yellow.

Type: Mill Creek, Walla Walla, Washington, July 4, 1922.

Allotype: Union Flat, near Pullman, Washington, June 16, 1916. Paratypes: Two males with the type, and another, Pullman, Washington, June 16, 1912; two females, Pullman, Washington, June 16, 1918, and Salem, Oregon, July 4, 1917.

Trixoscelis frontalis Fallen

Fallen, 1823, Agromyz., 7 (*Anthomyza*). Meigen, 1830, Syst. Bes. vi, 111 (*Opomyza*). Macquart, 1835, Suit. II, 581 (*Leptomyza*). Zetterstedt. Dipt. Sc. VII. 2698 (*Anthophilina*). Loew, 1865, p. 22 (*Geomyza*). Becker, 1903, Mitth. Mus. Berl. II. 3, p. 187 (*Geomyza*). Czerny, 1903, p. 125 (*Geomyza*). Melander, 1913 A, p. 296. Collin, 1943, p. 249.

Cheeks about one-fourth the eye-height; last antennal joint circular, yellow in all males and with brownish spot on outside in nearly all females. Thorax black, heavily cinereous, sometimes with slightly yellow tinge, acrostichals fine, sparsely scattered in four rows, rarely the prescutellars stronger. Abdomen laterally cinereous, dorsally subshining in male to dull and cinereous in female. Posterior coxæ and legs yellowish.

This is our commonest species. Although I do not have European specimens for verification the American species seems to be identical with *frontalis*, which occurs throughout Europe. The easiest recognition character is the color of the front legs, the coxæ being quite white, their femora black and the front tibiæ and tarsi ranging from black to brownish yellow. Nearly all the females have the front legs wholly black, and the paler front tibiæ and tarsi are found in about half of the males, the rest of the males having black front legs like the females.

I have mounted some three hundred specimens collected in seventy-one localities in British Columbia, Vancouver Island, Washington, Idaho, Montana, Oregon, California and Arizona.

Trixoscelis fumipennis Melander

Melander, 1913, Psyche XX. p. 168.

Length 2.5 mm. Front reddish-yellow, becoming brown each side of ocellar triangle, face and cheeks whitish, cheeks two-fifths the height of the horizontally elliptical eyes, occipital setulæ coarse; last joint of antennæ oval, dusky except below at base, arista brown; mouthparts yellow. Thorax red-

dish yellow in ground color with brownish vittæ on dorsocentral and presutural rows, acrostichals in two definite median rows plus some scattered ones. Abdomen shining castaneous. Coxæ yellowish, front legs brownish, posterior legs reddish yellow. Wings with veins and posterior crossvein bordered with brown, marginal cell wholly infumated, costa blackish to base.

The type came from Aweme, Manitoba. I have taken the species at Liberty Lake, near Spokane, Washington, June 26, 1924.

***Trixoscelis mohavea*, new species**

MALE.—Length 2.1 mm. Front yellowish, extending on each side of the light testaceous ocellar triangle to the level of the posterior ocelli, orbits whitish; face and cheeks whitish, the latter one-eighth the height of the eye; occiput with three rows of setulæ; antennæ black with a small yellow mark at base of the black arista, larger within; mouthparts yellow. Mesonotum densely covered with pale golden dust, two rows of sparse acrostichals; scutellum and pleuræ concolorous; mesopleural bristle located at one-third. Abdomen black in ground-color, the incisures not differentiated, covered with fine gray pollen. Legs uniformly flavous. Wings subhyaline, lightly marked with clouds in marginal and submarginal cells and along posterior crossvein and fifth vein, veins blackish except at base, costal setulæ short.

FEMALE.—Acrostichals in four sparse rows.

Four specimens: Mojave Desert, California, Piute Butte, May 12, 1944; and Big Rock Wash, May 13, 1944.

***Trixoscelis nitidiventris*, new species**

FEMALE.—Length 2 mm. Lower front luteous, upper two-fifths dark especially on each side of the prominent ocellar triangle, face and cheeks whitish, the cheeks narrow, one-sixth the eye-height, not deeper behind, eyes nearly round, very slightly higher than broad; upper occiput with a few setulæ behind orbital row; antennæ yellow, outer joint slightly infuscated outside, almost circular, arista black; proboscis blackish. Thorax dark cinereous on a black ground, scutellum and pleuræ concolorous, four irregular rows of sparse acrostichals. Abdomen polished black. All coxæ and front legs black, posterior femora blackish, posterior tibiæ and tarsi dark brownish. Wings nearly hyaline, veins and costa clear and brown, anterior crossvein at middle of discal cell, posterior crossvein slightly shorter than last section of fifth vein.

Three specimens: Beaumont, California, April 25, 1944; and Perris, California, May 10, 1945.

By its dark coxæ and femora the species seems close to *litorea*, but lacks the facial marks and abdominal pruinosity of that species. *Litorea* has yellowish tibiæ and tarsi and pale veins.

Trixoscelis nuda Coquillett

Coquillett, 1910, Proc. Ent. Soc. Wash. xii. p. 130 (*Leria*).

Aldrich, 1929, Proc. Ent. Soc. Wash. xxxi, p. 34.

Synonym: *prima* Hendel, 1911, p. 43. Melander, 1913, p. 296.

Length 2.5 mm. Eyes round; antennæ yellow, the last joint round, with a small exterior brownish spot, arista brown; proboscis black. Thorax black in ground color, cinereous with slight golden tone, two distinct rows of acrostichals. Abdomen cinereous, not shining. Coxæ and legs wholly yellow, the posterior coxæ sometimes darkened at base. Wings hyaline, veins yellow.

Coquillett described *Leria nuda* from two specimens, one from Claremont, California, and the other from Boulder, Colorado. Aldrich designated the California cotype as the lectotype, because the Colorado specimen belonged to *Parodinia cinerea* Coquillett. In the meantime Hendel had described *Trixoscelis prima*, as the first record of the occurrence of *Trixoscelis* in America. Hendel's *prima* came from Claremont, California, and proved to be Coquillett's *Leria nuda*.

I have mounted nearly two hundred specimens, representing thirty collecting stops in Riverside, San Bernardino, San Diego, Orange and Los Angeles counties, all in Southern California. I have also taken the species at Welton, Arizona, and at Husum, Washington.

***Trixoscelis plebs*, new species**

MALE.—Length 1.9 mm. Cheeks very narrow, one-eighth the eye-height, eyes round; front pale yellow merging into the yellowish cinereous occiput; antennæ wholly pale yellow, the last joint round, with fuscous arista, the base yellow; mouthparts pale yellow. Thorax cinereous, acrostichals sparse and short; pleuræ without setulæ; abdomen cinereous, pygidium subshining. Legs pale flavous, the front femora sometimes darkened along the distal half leaving the knees yellow. Wings hyaline with a yellowish tinge, paler at base, veins yellowish, the costal setulæ very small, anterior crossvein at middle of discal cell; posterior crossvein equal to last section of fifth vein. Knob of halteres white.

Travertine Rock, on the West side of Salton Sea, California, May 2, 1945; two male and three female specimens; Indio, California, same date, one female.

The reduced size of the bristles and the small number of setulæ are distinctive.

***Trixoscelis pygochroa*, new species**

Length 2.3 mm. Anterior half of front and two posterior prongs flavous, orbits whitish, posterior part merging into the yellowish occiput, occipital triangle large; face and cheeks whitish, the cheeks one-fifth the diameter of the round eye, merging into the occiput; antennæ fuscous, the outer joint with a small flavous spot under the base of the fuscous arista, the inner side flavous on almost the basal half; mouthparts pale yellow. Thorax pale flavous, heavily pollinose, two thin light-brown vittæ along the dorsocentral rows; pleuræ slightly darker than the notum, mesopleural bristle at one-third the distance down. Abdomen slightly blackish under the yellow coating, pygidium large, luteous, anteriorly with two thin long terminal appendages. Base of wings whittish, costa blackened from two-thirds the auxiliary cell, marginal cell all blackened, veins firm and blackish except the fourth vein almost to the posterior crossvein.

A pair from Palm Springs, California, November 10, 1944, and April 24, 1944.

***Trixoscelis sagulata*, new species**

Length 2 mm. Lower two-thirds of front luteous, upper third concolorous with upper five-sixth of occiput, face and cheeks dull yellow, the cheeks one-sixth the eye-height; antennæ fuscous, outer joint circular, the lower third flavous, arista blackish; mouthparts dull yellow. Thorax cinereous, marked with two fuscous vittæ just inside the dorsocentral rows, acrostichals sparse and small, in four irregular rows; pleuræ cinereous, the upper half of mesopleura and pteropleura with a vague brown band, mesopleura with scattered setulæ. Abdomen lightly cinereous, the small pygidium shining. Front coxæ whitish, the posterior pairs yellowish, front legs otherwise black, posterior legs sordid yellow. Wings hyaline, with slight yellow tinge, veins thin, dull yellow, anterior crossvein at middle of discal cell, posterior crossvein a little longer than last section of fifth vein, costal setulæ small.

Types: Whitewater Canyon, California, November 11, 1944. Thirteen male and eighteen female paratypes: Utah: Zion Park, April 20, 1935. Arizona: Superior, April 13, 1935; Huachuca Mountains, Miller Canyon, May 3, 1948. California: Salton Beach, November 12, 1945; Borrego Desert, Palm Canyon, November 10, 1945; Morongo, November 26, 1946; Palm Springs, November 20, 1943; Cathedral City, November 22, 1944; Oak Glen, June 19, 1946; La Jolla, December 29, 1934.

***Trixoscelis signifera*, new species**

FEMALE.—Length 2.8 mm. Front half luteous, merging into the blackish occiput, face and cheeks flavous, the cheeks about one-eighth the eye-height; antennæ luteous, the outer side of the last joint fuscous except the upper edge, arista blackish; proboscis reddish on last section. Thorax blackish in ground color, covered with dark cinereous dust, two brown vittæ evident

within the dorsocentral rows, acrostichals very sparse, about four rows anteriorly, mesonotal setæ long; pleuræ dark cinereous, the upper part with a brown vitta. Abdomen subshining along middle, concolorous with notum along sides, incisures yellow and set off by rows of strong bristles just before them. Front coxæ flavous, front legs black, with tibiæ less so, posterior legs including the coxæ flavous. Wings with entire costal margin infumated, marginal cell subhyaline up to the end, posterior crossvein clouded, longer than last vein, third, fourth and fifth veins yellowish at base, the third dark only in outer fifth, the fourth on outer half, the fifth on outer third.

Six specimens. Type: Ortega Highway, El Cariso Camp, May 15, 1946. Paratypes: Ortega Highway, San Juan Camp, May 26, 1944; Laguna Beach, March 28, 1935; San Francisco, August 1, 1915; Palo Alto, August 2. All in California.

Rhinoessa costalis Coquillett (1901: Proc. Wash. Acad. Sci. III. 378) from the Galapagos Islands is similar. It is much smaller, 1.5 mm., has front legs dark brown and the infumation of the wings begins at end of the first vein and does not include the posterior crossvein. See remarks under *claripennis*.

Trixoscelis suffusa, new species

MALE.—Length 1.2–2 mm. Front one-half wider than long to the ocelli, flavous, the ocellar triangle reaching half-way, the orbits pale yellow, occiput cinereous black, with two scattered rows of setulæ; face and cheeks whitish, the cheeks one-fourth the eye-height; antennæ blackish, the outer joint yellowish within on basal half or less and on outer side yellow at upper corner; palpi whitish, proboscis yellow. Mesonotum and scutellum with golden dust, two rows of minute acrostichals; pleuræ yellow. Abdomen testaceous at base becoming blackish apically and covered with fine thin yellow dust; pygidium round, large, rufous, provided with blackish hairs. Legs wholly light flavous. Wings subhyaline, the marginal cell lightly infuscated, veins blackish, discal cell outwardly equal to first posterior cell.

FEMALE.—Front tarsi infuscated.

Twenty-eight specimens. Types: Oak Glen, California, July 2, 1945. Paratypes: Washington: Entiat, July 26, 1919; Gollendale, July 23, 1921. California: Morro Bay, July 27, 1940; Scotland, September 19, 1943; Oak Grove, May 8, 1943; Mountain Home Canyon, May 13, 1947; Barton Flat, June 20, 1945–September 7, 1946; Falls Valley, July 10, 1940; Crestline, July 4, 1942; Victorville, May 22, 1945.

Trixoscelis triplex, new species

Length 2 mm. Body rosaceous, slightly darker on occiput and abdomen, and yellow on face, cheeks and legs. Front luteous, posteriorly merging

with the occiput. Antennæ yellow at base, male with last joint wholly yellow within and with a suffused dusky spot on the upper part of the outer side, female with inside of last joint and apical two-thirds of outside blackish, last joint one-third longer than deep, arista blackish to base; cheeks one-sixth the eye-height; palpi and proboscis yellow. Three darker narrow vittæ evident on mesonotum; acrostichal setulæ all very small, thoracic and head bristles long. Legs flavous, the front femora darkened except at base. Wings hyaline, the veins slightly brownish, third and fourth veins slightly closer together than usual, the apical sections of costa proportioned 2:1, anterior crossvein at about three-fifths the discal cell, posterior crossvein shorter than last section of fifth vein.

Types: Organpipe Cactus National Monument, Arizona, April 18, 1947. Twelve paratypes: Mexico; Sonoyta, April 21, 1947. Arizona: Sabino Canyon, near Tucson, July 5, 1942; Liguerta, April 9, 1937. California: Gordon Wells, Imperial County, April 9, 1947; Palm Canyon, Borrego Desert, May 2, 1945; Palm Springs, April 24, 1944.

***Trixoscelis tumida*, new species**

MALE.—Length 3 mm. Occiput and mesothorax testaceous, abdomen blackish covered with yellowish pollen. Front flavo-testaceous, wider than long, postocellar bristles strong; face and cheeks pale yellow, the cheeks one-third the diameter of the round eyes; antennæ yellow at base, outer joint brownish except at base of inner side; arista fuscous except the paler base; mouthparts flavous. Thorax with long bristles, about four rows of acrostichal setulæ on disk and about three rows outside the dorsocentral rows; scutellum concolorous; mesopleural bristle near middle of mesopleura. Hypopygium fuscous, the valves longer than usual. Legs flavous, the front and hind metatarsi swollen and fuscous, nearly as thick as their tibiæ. Wings hyaline, with yellowish tone, veins yellowish, posterior crossvein longer than last section of fifth vein, anterior crossvein slightly before the middle of the discal cell; knob of halteres whitish.

FEMALE.—Metatarsi not swollen nor darkened.

Types: Lucerne, on Lake Chelan, Washington, July 29, 1919. Twelve male and fifteen female paratypes: Oregon: Mt. Hood, July 29, 1921. California: Green Valley, July 26, 1944; Crestline, July 4, 1942; Barton Flats, July 29, 1942–September 4, 1944; Jenks Lake, June 20, 1945; Big Pines, August 9, 1944; Mojave Desert, Lovejoy, May 10, 1944; Palm Springs, April 2, 1945; Corona del Mar, December 28, 1944.

The California specimens have the occiput quite blackish, the pygidium black and the hind metatarsi less fuscous.

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