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## REVIEW OF THE TACHINID GENUS *CALODEXIA* VAN DER WULP (DIPTERA)

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The genus *Calodexia* was established by Van der Wulp in 'Biologia Centrali-Americana' in 1891 and included three species, the first of which, *majuscula*, was selected as the genotype by Coquillett in 1910. The other two species do not belong to the genus, and their generic position is doubtful. In 1868 Schiner had described a species from Brazil, placing it in the genus *Meigenia*, and three additional species were described by Townsend in 1912 and 1915, each distributed in a new genus. The species described by Schiner and Van der Wulp were based on male specimens, while Townsend's species were all described from females.

The habits of the species of *Calodexia* are peculiar, but nothing is known about the immature stages. The genus is restricted to tropical America, and the females may be found in large numbers associated with moving armies of ants, but in not quite the same way as are the species of *Stylogaster*.<sup>1</sup> Whereas the species of *Stylogaster* hover over the ant army, the females of *Calodexia* sit upon foliage in front of the army or to either side near the front. They sometimes occur in thousands, and as they fly from leaf to leaf to keep ahead of the moving army they create a buzzing that may be heard for a distance of more than twenty feet. In every case in which I located armies of ants I was attracted by the noise of the flies.

One can only conjecture concerning the immature stages. From my observations I feel confident that the eggs or larvae are deposited upon cockroaches, of which large numbers are driven from their hiding places by the ants. As soon as a cockroach appears dozens of flies will dart toward it, apparently in an endeavor to oviposit. Whether they succeed or not, I cannot say, but from this it appears that the species of *Calodexia* are parasitic on cockroaches and that their association with the ants is due to the assistance rendered in locating the host.

Males are seldom, if ever, found associated with ants, and this renders the association of the two sexes very difficult, although not much assistance would be afforded, since half a dozen species usually occur

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<sup>1</sup>See Aldrich, 1930, Proc. U. S. N. M., LXXVIII, Art. 9, pp. 4 and 5.

together. The males sit about on foliage along the trails or in clearings and are remarkably rare considering the abundance of females. The males of only four species have been associated with females, and no females are known of five of the species. Only by a study of the chaetotaxy and mesonotal markings can the two sexes be associated. The abdominal pattern is very similar in all known males, but the color of the legs appears to be fairly constant in the two sexes.

I am greatly indebted to Dr. J. M. Aldrich for the loan of unnamed material in the United States National Museum, thus increasing the scope of this review of the genus, and to Mr. Nathan Banks for the loan of specimens from the Museum of Comparative Zoölogy. Unless otherwise stated, the types are in The American Museum of Natural History.

#### **Calodexia** Van der Wulp

VAN DER WULP, 1891, 'Biol. Cent.-Amer.,' Dipt., II, p. 257.

*Oestrogaster* TOWNSEND, 1912, Proc. U. S. N. M., XLIII, p. 309.

*Oestrogastropsis* TOWNSEND, 1915, Proc. U. S. N. M., XLIX, p. 424.

*Oestrogastrodes* TOWNSEND, 1915, Proc. U. S. N. M., XLIX, p. 425.

Head short, the eyes large, leaving the cheeks very narrow, never more than one-twelfth as wide as the eye-height; parafacials narrow, narrowing below; front narrow, with rather parallel sides, the lowest pair of frontals usually situated below the upper edge of the antennae, the upper two pairs strong and reclinate; ocellars short and weak or absent; two pairs of proclinate orbitals in the female; outer verticals developed in the females; face rather flat; proboscis short, the palpi gradually enlarged from near the base but not swollen. Antennae long; arista practically bare or very short plumose on the basal half or less, the upper rays longest, the lower sometimes practically absent; eyes bare. Acrosticals variable, usually 1-1, often 1 or 2-3, rarely entirely absent or only the prescutellar pair present; dorsocentrals, 2-3; two or three intra-alars, the anterior pair often absent or short; posterior sublateral and posthumeral bristles absent. Scutellum with two to four pairs of marginals, the apical pair always weak, hairlike or absent, divergent when present, the second pair weak or absent; sternopleurals, 1-1; infrasquamal setulae usually present. Legs of normal length; middle femora with one or two anterior bristles near the middle, the middle and posterior femora sometimes short ciliate below in the males; middle tibiae with or without a ventral bristle beyond the middle; anterior tibiae with one posterior bristle. Wings normal, the third vein with two to six short basal bristles. Squamae large. Abdomen of the male elongate, tapering, the sides very gently convex or almost straight; first segment with pair of marginals and one lateral marginal; second segment with pair of marginals and one lateral marginal, rarely with an incomplete row of weak marginals; third segment with pair of discals and row of marginals; fourth with one or two rows of discals and row of marginals, rarely with only one pair of discals. In the female the abdomen is short and oval, deep and slightly keeled below, the genital opening entirely ventral, the ovipositor emerging between the sides of the third tergite or just behind, almost always in front of the posterior dorsal edge of the third tergite; fourth segment sloping toward the base of the abdomen from about the basal fourth, or perpendicular,

the apex of the abdomen very obtuse; chaetotaxy as in the male except on the fourth segment where there is usually a very strongly arched row of discals, rarely an extra pair of discals above the arch, rarely only one pair of discals, and usually a row of marginals on either side of the genital opening.

This genus contains twenty-three species, of which eighteen are described for the first time. The following key will separate the known species.

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#### ***Calodexia aldrichi*, new species**

Black, the middle tibiae without a bristle below; pleura black-haired; dark post-sutural fascia entire. Length, 5.25 mm.

**FEMALE.**—Head white pollinose. Front with parallel sides, slightly narrowed at the vertex, about two-fifths as wide as either eye; eight or nine pairs of frontals, the upper two reclinate; ocellars absent; outer verticals strong. Occiput with black hair, the occipital cilia extending almost to the cheeks. Cheeks very narrow, with a row of black bristles. Proboscis brownish; palpi reddish brown, with black hair. Antennae brown; arista very short pubescent basally.

Thorax cinereous-white pollinose. Mesonotum in front of the suture with a pair of black stripes and outside these a large, suborbicular black spot which is continued broadly along the inner border of the humeri, all the black markings well separated from the suture. Behind the suture the mesonotum is black with a broad, pale prescutellar fascia. Scutellum wholly blackish, with three pairs of marginals and no apical hairs in the type. Acrosticals, 1-1; anterior intra-alar rather well developed.

Legs blackish, the anterior coxae somewhat paler, pale pollinose; middle tibiae without ventral bristle.

Wings cinereous hyaline, with slight brown tinge. Squamae pale brownish, the base broadly white. Halteres yellow.

Second abdominal segment with almost the basal half white pollinose dorsally, the pollen quite thin in the middle of the dorsum except on the base of the segment and expanding to occupy more than half the segment at the sides and beneath, but not reaching the lateral margins of the tergites; third segment similar, but the pollen is denser toward the middle of the dorsum where it is broadly interrupted; fourth segment white pollinose with a very broad, bare, vertical median stripe extending from the base to the apex. First segment with a pair of marginals, the second and third each with a row, these segments also with a pair of discals; fourth segment with the arched row of discals and a pair of discals above the arch. Hair wholly black.

**TYPE.**—Female, Chapada, Brazil (Williston Collection).

This species is very similar to *fumosa* Townsend, differing in having the pollinose fascia on the second abdominal segment entire, a very much

stronger anterior intra-alar bristle, more numerous marginal bristles on the third abdominal segment, and more discals on the fourth, and larger size.

***Calodexia fumosa* Townsend**

*Oestrogaster fumosus* TOWNSEND, 1912, Proc. U. S. N. M., XLIII, p. 309.

A small, black species with white fasciate thorax and abdomen, the pollinose fascia on the second segment conspicuously interrupted in the middle. Length, 3.5 to 4 mm.

Thirteen females, Barro Colorado Island, Canal Zone, December 23, 25, 26, and 29, 1928 (Curran); eight females, Barro Colorado, July 23, 26, 1924 (N. Banks).

This species is very similar in appearance to *aldrichi*, new species, but may be at once distinguished by the interrupted pale pollinose fascia on the second abdominal segment and its smaller size.

***Calodexia fasciata*, new species**

Middle tibiae without ventral bristle; postsutural black fascia interrupted laterally; pleural pile black. Length, 5.5 to 7 mm.

FEMALE.—Head white pollinose, the upper half of the front and upper third of the posterior orbits rather ochreous. Front slightly more than one-third as wide as either eye, with almost parallel sides but distinctly narrowed at the vertex; six to eight pairs of frontals, the upper two reclinate, the anterior pair sometimes situated below the base of the antennae; two pairs of strong orbitals; ocellars hairlike but conspicuous; outer verticals strong. Occiput with very pale yellowish or whitish hair, the black occipital cilia extending to the middle of the eyes. Cheeks linear, with two or three black bristles. Parafacials narrow, narrowing below. Proboscis brown, with yellow labellae; palpi reddish yellow, with black hair. Antennae reddish yellow, the third segment brownish apically; arista brown with reddish base, short pubescent on the basal third.

Thorax cinereous pollinose, the mesonotum often with strong ochreous tinge. Four short, black mesonotal vittae in front of the suture, all broadly separated from the black postsutural fascia which is interrupted above the roots of the wings. Base of the scutellum broadly blackish; two pairs of marginals, a third very weak pair sometimes present and usually a pair of hairs between the apical pair. Acrosticals, 1-1, although there may be a second pair of weak presuturals; anterior intra-alar absent or very weak. Pleura with black hair.

Legs blackish; anterior coxae usually mostly reddish yellow; trochanters reddish yellow, the middle femora with the basal fifth, the hind pair with the basal third, reddish yellow, the tips of the femora often reddish, the anterior pair sometimes more or less reddish at the base below; hair black.

Wings cinereous hyaline. Squamae light brownish, with whitish base. Halteres yellow.

Abdomen black, with cinereous or cinereous-yellow pollinose fasciae. Pale fascia occupying the basal third of the second segment toward the sides and expanded in the

middle and on the under surface; band on the third segment occupying almost or fully the basal two-thirds dorsally, the fourth segment pale pollinose with a broad, vertical, pale brownish stripe; pollen becoming white on the venter. First and second segments each with a pair of marginals, the third with a row; second and third segments each with a pair of discals, the fourth with a narrow, arched row which is irregular, containing some additional bristles outside the row.

**TYPES.**—Holotype, female, Barro Colorado Island, Canal Zone, December 29, 1928 (Curran). Paratypes: nineteen females, Barro Colorado Island, December 25, 26, 29, 1928 (Curran); six females, Barro Colorado Island, November 20, 1930 (F. E. Lutz); three females, Barro Colorado Island, July 26, 1924 (N. Banks).

### ***Calodexia dives*, new species**

Readily recognized by the pale pilose pleura, black legs, and absence of presutural acrostical bristles. Male unknown. Length, 7.5 to 9 mm.

**FEMALE.**—Head white pollinose, the upper half of the parafrontals and the upper posterior orbits more or less yellowish. Front scarcely half as wide as either eye, gently widening to the middle, the sides almost parallel on the anterior half; six to eight pairs of frontals, the upper two reclinate, the anterior pair situated below the base of the antennae; two pairs of proclinate orbitals; ocellars scarcely developed; outer verticals strong. Occiput with whitish hair, the black occipital cilia extending to the lowest fourth of the eye. Cheeks very narrow, with a row of three or four black bristles. Parafacials moderately wide above, becoming very narrow below. Proboscis brown, labellae yellow; palpi reddish yellow, with black hair. Antennae brownish, the base of the third segment broadly yellow, the basal segments usually brownish red; arista brown, very short plumose on the basal third, the base more or less reddish.

Thorax cinereous pollinose, the mesonotum and scutellum usually with strong ochreous tinge and sometimes quite strongly ochreous. Median black vittae rather wide, replaced on the posterior fourth by a brown median vitta, the outer vittae continuous and extending to the posterior dorsocentral; base of scutellum broadly blackish; four pairs of marginal scutellars, the apical pair divergent; acrosticals, 0-1; anterior intra-alar well developed. Pleura white pilose, the notopleura with black hair.

Legs black; the trochanters reddish, the anterior coxae appearing brownish red in some lights; coxae cinereous pollinose and with fine whitish hair. Middle tibiae with a bristle below.

Wings cinereous hyaline, distinctly clouded with brown on more than the apical half. Disc of squamae pale brown. Halteres yellow.

Abdomen black, with cinereous pollen, the tips of the tergites yellow on the under side. Second segment pale pollinose on more than the basal half, the fascia distinctly broadened on the median third; third segment with the pale pollinose fascia wider, the fourth wholly pale pollinose; discal bristles on second and third segments arising from dark spots. First and second segments each with a pair of strong marginals, the third with a row, the fourth with a row of weaker bristles along the sides of the genital opening; second and third segments each with a pair of discals, the fourth with a row. Hair black, very broadly pale along the middle of the venter from the base to the fourth segment.

**TYPES.**—Holotype, female, Barro Colorado Island, Canal Zone, December 25, 1928. Paratypes: nineteen females, Barro Colorado Island, December 23, 25, and 29, 1928 (Curran).

***Calodexia fulvibasis*, new species**

Black, the broad bases of the posterior femora reddish; no acrostical bristles. Length, 6 mm.

**FEMALE.**—Head whitish pollinose. Front two-fifths as wide as either eye, the brown vitta wider than either parafrontal; seven or eight pairs of frontals, the upper two reclinate, the lower two small and situated below the base of the antennae; two pairs of orbitals; ocellars very small; outer verticals weak. Occipital pile pale yellowish, the black occipital cilia extending to below the middle of the eyes. Cheeks very narrow, with a row of black bristles. Parafacials very narrow except above. Proboscis brown; labellae yellow; palpi reddish yellow, the hair mostly coarse and black. Antennae brown, the incisures dull reddish; arista pubescent above and below on basal third.

Thorax cinereous-white pollinose; mesonotum with four black vittae, the outer pair wide and extending almost to the scutellum, the inner pair narrower, extending to well behind the suture where the pollen between them is yellowish brown. Scutellum blackish, with narrow cinereous border, bearing three pairs of marginals but the median pair is very weak. Hair wholly black. No acrosticals; two intra-alars.

Legs blackish; posterior femora reddish on the basal half, the middle pair broadly reddish basally on the posterior surface; middle tibiae with ventral bristle.

Wings strongly tinged with brown. Squamae brownish except on the broad base, the rim yellowish. Halteres yellow.

Abdomen black, with cinereous-white pollen which becomes white on the under surface. On the second and third segments the pollen forms a narrow basal fascia and expands strongly just at the lateral margins where it occupies more than the basal half of the segments and is even more extensive toward the sides of the under surface; in the middle of the dorsum it expands greatly but is thin and more grayish, but it leaves a median, dark vitta. Fourth segment cinereous pollinose with a broad, median vertical pale brown stripe. First and second segments with pair of marginals, the third with a row; second and third segments each with a pair of discals; fourth segment with an arch of four discals and with fine bristles on the sides of the genital opening. Hair black, yellow on the under surface of the first segment and on the second sternite.

**HOLOTYPE.**—Female, Huascaray Ridge, Prov. Jaen, Peru, 7000 ft., September 22 (C. H. T. Townsend), in U. S. N. M.

***Calodexia townsendi*, new species**

Black, with rather plumbeus pollen; no acrosticals. Length, 6 mm.

**FEMALE.**—Head with rather plumbeus pollen. Front about half as wide as either eye, the black vitta much wider than either parafrontal; eight or nine frontals, the upper two reclinate, the lower one or two situated below the base of the antennae; two pairs of orbitals; ocellars moderately long; outer verticals more than half as long as the verticals. Occipital pile whitish, the black occipital cilia extending to the lower border of the eyes. Cheeks narrow, with a row of black bristles. Parafacials narrow, tapering below. Proboscis black, the labellae dull reddish. Palpi reddish brown with paler apices, the hair black. Antennae black, the arista pubescent above on basal third or more.

Thorax rather plumbeus pollinose; mesonotum with four weak, brown vittae, the median and outer ones more or less united well behind the suture. Scutellum

blackish, with plumbeous border, bearing three pairs of marginals and a pair of apical hairs. Hair black; no acrosticals and only two intra-alars.

Legs black; middle femora with a single anterior bristle near the middle; middle tibiae with strong ventral bristle.

Wings with brown tinge, the costal border narrowly brown. Squamae brownish with whitish base, the rim yellow. Halteres yellow.

Abdomen black, with thin, grayish-brown pollen, and rather plumbeous pollinose fasciae. The pale pollen on the second and third segments forms narrow basal fasciae that expand strongly toward the sides and continue over the under surface; fourth segment pale pollinose, with a rather narrow, vertical brown vitta in the middle. First and second segments each with a pair of marginals, the third with a row; second and third segments each with a pair of discals. Fourth segment with an arched row of six discals the lower pair fine and more approximate, the sides of the genital opening with fine bristles. Hair wholly black.

HOLOTYPE.—Female, Huascaray Ridge, Prov. Jaen, Peru, 7000 ft., September 22 (C. H. T. Townsend), in U. S. N. M.

This species and *fulvibasis*, new species, form a distinct group characterized by the entire absence of acrostical bristles, but they are approached in this respect by *dives*, new species, which has only the pre-scutellars present.

#### ***Calodexia bella*, new species**

Black, with cinereous pollen, the abdomen partly reddish; postsutural fascia entire; acrosticals, 2 or 3-1. Length, 6 to 8 mm.

MALE.—Head white pollinose, the parafrontals and upper part of the posterior orbits pale golden or brassy yellow. Front about two-fifths as wide as either eye, gently widening anteriorly and toward the vertex; about ten pairs of frontals, the lowest situated at most slightly below the base of the antennae, the upper two reclinate but not much stronger than the others; ocellars very weak; frontal vitta brown, about as wide as either parafrontal. Occiput with white or yellowish-tinged hair, the black occipital cilia extending to below the middle of the eyes. Cheeks narrow, with a row of black bristles. Parafacials narrow, narrowing below, mostly yellowish. Proboscis brown, the labellae reddish brown; palpi rather dull reddish-yellow, with black hairs. Antennae reddish, the third segment mostly brown; arista brown, almost bare, reddish basally.

Pollen of thorax usually with ochreous tinge. Mesonotum with four presutural black vittae and a wide, entire black fascia behind the suture, the fascia deeply emarginate above the roots of the wings from some views. Scutellum with the base broadly black, with two pairs of strong marginals and sometimes a very weak third pair, the apicals absent. One strong and one or two pairs of weak presutural acrosticals and a single postsutural pair; anterior intra-alar short. Hair black.

Legs black, the trochanters reddish; coxae appearing partly reddish; middle tibiae with ventral bristle.

Wings tinged with brown. Squamae with brown tinge, the border pale yellowish. Halteres yellow.

Abdomen black and reddish yellow with cinereous or cinereous-yellow pollen above and white pollen below. Second segment with the basal two-thirds to three-



fourths reddish yellow except for a broad median vitta; third segment with basal half pale except on the broad middle; first segment usually broadly pale posteriorly on the sides and under surface. Almost the basal third of the second and third segments pale pollinose, the pollen expanding medianly on the dorsum, and somewhat irregular in width on the sides and under surface; fourth segment with about the basal half pollinose, but the median third appears dark in some lights. Hair black. First and second segments each with a pair of marginals the third and fourth each with a row; second to fourth segments each with a pair of discals.

Types.—Holotype, male, Barro Colorado Island, Canal Zone, December 25, 1928. Paratypes: twelve males, Barro Colorado Island, December 22, 23, 25, 28, 1928, and January 3, 1929 (Curran).

Despite the presence of the ventral bristle on the middle tibiae I think the specimens here described are the males of *fasciata*, new species, but I hesitate to associate the two without more evidence. The shape of the black mesonotal markings would seem to indicate this, but the presence of the tibial bristle appears to throw the specimens into a different group. I have been unable to associate any males with the *fumosa* group, and, since two of the species are common, this seems very strange, although males are unknown of some of the other common species.

#### *Calodexia interrupta*, new species

Pleura with pale yellowish hair; legs black, the middle tibiae with ventral bristle: one pair of presutural acrosticals; coxae with black hair. Length, 5.5 to 8 mm.

MALE.—Head black in ground color, the parafacials yellowish; pollen whitish, rather golden on the front and upper half of the posterior orbits. Front one-third as wide as either eye, slightly widening on the anterior half; vitta brown, narrower than either parafrontal except above; ten pairs of orbitals, the lowest situated below the base of the antennae, the upper two strong and reclinate; ocellars very weak. Occiput with white hair, the black occipital cilia extending only to the middle of the eyes. Cheeks very narrow, with a row of black bristles. Parafacials narrow and narrowing below. Proboscis brown; labellae and palpi yellow, the palpi with black hairs. Antennae reddish yellow, the second segment and sometimes the apex of the third tinged with brown; arista brown with reddish base, very short plumose on the basal third.

Mesonotum with cinereous-yellow pollen and four blackish vittae, the median vittae fused behind the suture and with a backward projection in the middle so that all three stripes end about the same distance in front of the scutellum; outer vittae interrupted at the suture. Scutellum cinereous yellow with the base broadly dark, bearing three pairs of marginals and a pair of apical hairs. Pleura cinereous pollinose and with pale yellowish hair.

Legs black; coxae cinereous pollinose and with black hair; trochanters reddish. Middle and posterior femora closely ciliate on the apical two-thirds of the ventral surface with long black or rather golden-brown hairs. Middle tibiae with ventral bristle.

Wings cinereous hyaline, with more or less brownish tinge. Squamae whitish with brownish tinge on the disc. Halteres yellow.

Abdomen reddish and brown with cinereous-yellow pollen, the pollinose fasciae becoming white on the under side of the second and third segments. First segment brown with about the apical half dull reddish except on the broad middle line, the reddish color extending broadly to the base at the ventral edges; second segment dull reddish with about the apical half appearing brown, the brown fascia broadly narrowed in the middle; third segment with only a little more than the apical third brownish, the fourth with only the apical fourth brown above. First and second segments each with a pair of marginals, the third and fourth each with a row; second and third segments with pair of discals, the fourth with a row. Genitalia reddish. From posterior view the abdomen appears mostly reddish, since the brown fasciae are partly due to pollen.

FEMALE.—Quite different in appearance. Front about two-thirds as wide as either eye; six or seven pairs of frontals, the upper two reclinate, and two pairs of strong proclinate orbitals; parafrontals usually paler but always with strong yellow tinge, the markings as in the male. Femora without the long cilia below, but the hairs on the apical half of the anteroventral surface of the posterior femora decidedly longer than in allied species. Abdomen blackish or dark brown, only appearing partly reddish when viewed from below; pale pollen on second segment almost as in the male, in the middle occupying almost the basal two-thirds and gradually narrowing to a little more than the basal half at the lateral third. On the third segment the pale pollen occupies about the basal two-thirds and extends very broadly to the apex in the middle. The fourth segment is wholly pollinose, although the pollen is thinner or brownish on the usual vertical apical portion, the segment with the arched row of strong discal and an incomplete arch of fine bristles, the arch broken above.

TYPES.—Holotype, male, and allotype, female, Barro Colorado Island, Canal Zone, December 21, 1928 (Curran). Paratypes: one male and fourteen females, Barro Colorado, December 22, 23, 25, 26, 29, and January 11, 1929 (Curran).

I had first associated these males with *continua*, new species, but they must belong here because of the color of the hair on the front coxae and the similar mesonotal markings. The acrosticals are 1-1, and the anterior intra-alar is well developed though decidedly weaker than the others. The discals on the second and third abdominal segments arise from small dark spots. The hair of the mesopleura is rarely partly black or brown.

#### ***Calodexia continua*, new species**

Legs black; pleura and front coxae white-haired; mesonotum with transverse black band behind the suture. Length, 7 to 8.5 mm.

FEMALE.—Head white pollinose, the parafrontals and upper third of the posterior orbits with strong yellow tinge. Front half as wide as either eye, slightly widening from the vertex to the middle; frontal vitta brown, much narrower than either parafrontal; six to eight pairs of frontals, usually one below the base of the antennae, the upper two reclinate; two pairs of orbitals; ocellars very weak. Occiput white-haired, the black occipital cilia extending to about the middle of the eyes. Cheeks very narrow, with row of black bristles. Parafacials rather narrow, becoming very narrow below. Proboscis brown; the labellae pale yellow. Palpi reddish yellow, with black

hairs. Antennae reddish yellow, the second segment and apex of the third more reddish or with slight brown tinge; arista brown, broadly reddish basally, very short, pale plumose on the basal fourth.

Thorax cinereous pollinose, the mesonotum and scutellum usually with yellowish tinge; mesonotal vittae fused behind the suture to form a transverse blackish fascia, although the median and outer vittae are very narrowly separated by a gray line; the outer ends of the black fascia are slightly produced backward and there is a small median black spur, the outer vittae broadly interrupted at the suture. Scutellum with the base broadly blackish, bearing three pairs of marginal bristles and a pair of apical hairs. Hair on pleura, notopleura, and lower border of the humeri white. Acrosticals, 1-1; anterior intra-alar well developed.

Legs black; anterior coxae largely reddish and bearing white hair; trochanters reddish; middle tibiae with a bristle below.

Wings cinereous hyaline, with brownish tinge. Squamae white, the disc lightly tinged with brown. Halteres yellow.

Abdomen black, with cinereous pollen, the pollen white on the under side. Second segment with slightly more than the basal half pale pollinose, the fascia expanding in the middle and on the under side; third segment similar but the pollinose fascia somewhat wider; fourth segment pale pollinose, but the perpendicular apex is broadly brownish red. From ventral view the abdomen appears reddish with broad brownish fasciae just before the apices of the tergites. Hair black, pale along the middle of the venter. First and second segments each with a pair of strong marginals, the third with a row, the fourth with a row of fine bristles along the sides of the genital opening; second and third segments each with a pair of discals, the fourth with a row. Genitalia yellowish.

TYPES.—Holotype, female, Barro Colorado Island, Canal Zone, December 25, 1928 (Curran). Paratypes: nine females, Barro Colorado Island, December 23, 25, 29, 1928 (Curran); four females, Barro Colorado Island, July 26, 1924 (N. Banks); female, Cano Saddle, Canal Zone, May 8, 1923 (R. C. Shannon); female, Polochic River, Guatemala, above Panzos, May 26, 1926 (J. M. Aldrich).

### *Calodexia flavipes* Schiner

*Meigenia flavipes* SCHINER, 1868, 'Novara Reise,' p. 326. ALDRICH, 1929, Proc. U. S. N. M., LXXIV, Art. 19, p. 22 (male only).

I am unacquainted with this species although there is a specimen in the United States National Museum that has been compared with the type. I doubt the correctness of the identity because a specimen before me agrees with the U. S. N. M. specimen but does not agree with Schiner's description, differing in many respects.

Schiner described *flavipes* from a male from Brazil, and the description agrees quite well with the male of *major*, new species, and *majuscula* Van der Wulp. However, at the time Dr. Aldrich made the comparison he had a male of *major* before him and he redescribed the type, so there can be no doubt as to its identity insofar as the known species are concerned. It may be readily distinguished from both *major* and *majuscula*

by the presence of yellowish cilia on both lower edges of the posterior femora.

A complete description is given by Aldrich, but the female belongs to *varia*, new species.

***Calodexia major*, new species**

Male abdomen mostly reddish; femora reddish; middle tibiae with ventral bristle; female abdomen black above, with cinereous pollen. Length, 8 to 11 mm.

MALE.—Head black, densely white pollinose, the face yellow in ground color, the parafrontals with golden-yellow pollen that extends on to the parafacials and along the upper half of the posterior orbits. Front two-sevenths as wide as either eye; the reddish-brown frontal vitta linear; ten pairs of frontals, one situated below the base of the antennae, several of the upper ones more or less reclinate, the hair very fine and yellowish; ocellars minute. Occiput with pale yellowish hair, the black occipital cilia not extending below the lowest fourth of the eyes. Cheeks very narrow, with fine white hair and black bristles. Parafacials narrow and narrowing below. Proboscis reddish, the labellae and palpi yellow, the palpi with black hair. Antennae reddish yellow; arista brown with dull reddish base, very short plumose on the basal half.

Mesonotum and apical half of the scutellum ochreous pollinose, the mesonotum with four black vittae, the median pair replaced by a single stripe in front of the scutellum, all the vittae reaching rather close to posterior border and not interrupted at the suture. Scutellum blackish on basal half; three pairs of marginals, the apical pair entirely absent; acrosticals, 1-1; dorsocentrals, 2-3; three pairs of intra-alars. Pleura whitish pollinose, white-haired, the dorsum with black hair.

Coxae and femora reddish yellow, the femora darkened apically; anterior and middle coxae with considerable pale hair; the posterior femora with pale hair on most of their length posteriorly. Middle tibiae with a ventral bristle. Tibiae reddish brown, the tarsi black.

Wings with brownish-gray tinge. Squamae pale brownish with yellowish border. Halteres yellow.

Abdomen reddish, the pollen ochreous; a broad median blackish vitta extends from the base to the apex of the abdomen, expanding slightly toward the apex of the second segment, expanding on the third segment to occupy the apical third of the segment where it scarcely extends to the under surface, and again expanding to form a blackish or ferruginous apex of the fourth segment. On the second and third segments the pale pollinose fasciae cover about the basal fourth, expanding to encircle the discal bristles and expanding and becoming white on the under surface. The fourth segment is yellow pollinose on about the basal two-thirds. First and second segments each with pair of marginals, the third and fourth each with a row; second and third segments each with a pair of discals, the fourth with a row. Hair black except on the base of the under surface. Genitalia reddish.

FEMALE.—Very different in appearance from the male. Front half as wide as either eye, with almost parallel sides, but distinctly narrowed at the vertex, the parafrontals wider than the brown frontal vitta anteriorly but becoming narrower above; eight pairs of frontals, the upper two strong and reclinate; ocellars minute; outer verticals half as long as verticals. Mesonotal pollen cinereous yellow. Coxae without

pale hair, the middle pair brown; femora generally darker, usually broadly brown above on the whole length and on the broad apices, as well as sometimes on the bases, rarely as in the male, but the hair on the posterior femora similarly colored. Abdomen black, the pollen cinereous and not dense, on the second and third segments forming fasciae as in the male, the fourth cinereous pollinose on the whole surface, the pollen somewhat tessellate and on the second and third segments leaving a small black spot in the middle of the triangular expansion, this spot connected with the black of the posterior border by a narrow vitta. This marking is less obvious in the male but may be detected. The fourth segment bears a strong row of discals and a much weaker subapical row.

**TYPES.**—Holotype, male, and allotype, female, Barro Colorado Island, Canal Zone, December 23, 1928. Paratypes: one male and thirteen females, Barro Colorado, December 23, 25, 26, and 29, 1928 (Curran); male, La Suiza, Costa Rica (F. Schild); female, Cano Saddle, Gatun Lake, Panama, May 14, 1923 (R. C. Shannon). Paratypes in U. S. N. M.

Despite the difference in the color of the abdomen, there can be no doubt that the two sexes described here belong together, since the markings of the thorax and the chaetotaxy agree.

#### ***Calodexia majuscula* Van der Wulp**

VAN DER WULP, 1891, 'Biol. Centr. Amer.,' Dipt., II, p. 257 (f.). ALDRICH, 1929, Proc. U. S. N. M., LXXIV, Art. 19, pp. 21, 22.

Aldrich has redescribed this species in detail, basing his description on a specimen from Mexico, compared with the type by Major Austen. My description of the male of *major* will apply quite well, but the middle and posterior femora bear whitish cilia below, and the infrascumal setulae are whitish. Van der Wulp's figure shows the median mesonotal vittae entire and not fused, but this may not be the case.

#### ***Calodexia agilis*, new species**

Black, the femora largely reddish; mesopleura black-haired; abdomen black-haired. Length, 6.5 to 7 mm.

**FEMALE.**—Head white pollinose, the upper half of the parafrontals and the upper part of the posterior orbits yellowish. Front a little more than one-third as wide as either eye, with almost parallel sides, narrowest at the vertex; frontal vitta blackish, much narrower than either parafrontal; seven or eight pairs of frontals, the upper two reclinate, the outer pair situated below the base of the antennae; ocellars absent; outer verticals strong. Occiput with pale yellow hair, the black occipital cilia extending to the lowest fourth of the eyes. Cheeks very narrow, with a row of black bristles. Parafacials moderately wide, strongly narrowed below. Proboscis reddish, the labellae and palpi yellow, the palpi with black hair. Antennae yellow, the basal segments somewhat darkened; arista brown with yellowish base, with conspicuous short rays on the basal third of the upper surface and short pubescence below.

Thorax cinereous pollinose, lightly tinged with yellow above. Mesonotum with four black vittae, the median pair united behind the suture and produced strongly

backward in the middle, thus forming a subtriangular spot that ends at about the same distance from the scutellum as the outer stripes. Scutellum with the base broadly brown, bearing three pairs of marginal bristles. Acrosticals, 1-1; three pairs of intra-alars. Hair black, partly fine and whitish on the pteropleura and sternopleura.

Anterior coxae wholly, the posterior pair mostly reddish, trochanters reddish yellow; femora reddish, the anterior pair brown above, middle pair reddish on the basal third except above and on the apical half of the under surface, the posterior pair reddish on the basal two-thirds and the apex; tibiae reddish brown, the tarsi black. Middle femora with two anterior bristles near the middle, their tibiae with a ventral bristle; anterior tibiae with three anterodorsal bristles.

Wings cinereous hyaline. Squamae whitish with the disc light brown. Halteres yellow.

Abdomen black, with cinereous pollen occupying a little more than the basal half of the second and third segments and expanding to occupy all but the apical fourth in the middle, in some lights reaching almost to the apex on the third segment; fourth segment pale pollinose and with a large, vertical brown apical spot on the lower half. First and second segments each with a pair of marginals, the third with a row; second and third segments each with a pair of discals, the fourth with a very strongly arched row and with two or three bristles along the sides of the genital opening. In the paratype the fourth segment is wholly pollinose. Hair black, only a very few pale hairs on the sternites.

TYPE.—Holotype, female, and paratype, female, Barro Colorado Island, Canal Zone, December 26 and 28, 1928 (Curran).

This species is very similar to *similis* Townsend but differs in the absence of ocellar bristles, wholly pale antennae, the presence of only three conspicuous anterodorsal bristles on the front tibiae, black-haired mesopleura, and almost wholly black-haired abdomen.

#### ***Calodexia similis* Townsend**

*Oestrogastroides similis* TOWNSEND, 1915, Proc. U. S. N. M., XLIX, p. 425.

Two females, Barro Colorado Island, Canal Zone, December 23, 1928 (Curran).

The description of *agilis*, new species, will apply very well to this species with the following exceptions: there is a pair of small ocellar bristles; the third antennal segment is very broadly brown apically; the pleura are wholly white-haired; the anterior tibiae bear five or six conspicuous anterodorsal bristles in a row beginning near the base; there is a stronger row of bristles on either side of the genital opening, and the under surfaces of the basal abdominal segments are almost all pale pilose. In addition, the pollen has an ochreous tinge, but this character is probably not constant.

*Calodexia insolita* Curran

The description of this species is contained in a paper<sup>1</sup> dealing with Diptera from Kartabo, British Guiana.

*Calodexia venteris*, new species

Basal abdominal segments reddish with dark median vitta; pleura pale pilose; a transverse blackish fascia behind the suture. Male unknown. Length, 7 to 9 mm.

**FEMALE.**—Head white pollinose, the upper half of the front and the posterior orbits above with yellowish pollen. Front slightly less than half as wide as either eye, very slightly widening from the vertex to the anterior margin; six to eight pairs of frontals, the upper two reclinate, the anterior pair situated below the base of the antennae; two pairs of proclinate orbitals; ocellars short; outer verticals more than half as long as the verticals. Occipital pile white, the black cilia extending to the middle of the eyes. Cheeks very narrow, with a row of black bristles. Parafacials rather narrow, becoming very narrow below. Proboscis and palpi yellow or reddish yellow, the palpi with black hairs. Antennae yellowish, the third segment broadly tinged with brown apically; arista brown, long pubescent on basal third of upper surface and very short pubescent below, the base dull reddish.

Thorax cinereous pollinose, with more or less ochreous tinge. Mesonotum with four black vittae, the outer pair interrupted at the suture and extending to well behind the second posterior dorsocentral, the median pair fused behind the suture and very narrowly separated from the outer pair; in the middle replaced by a narrow grayish vitta extending toward the scutellum and only visible in certain lights. Scutellum with the base very broadly blackish, bearing three pairs of marginal bristles. Acrosticals, 1-1; anterior intra-alar very weak. Pleura and lower part of the humeri with whitish hair.

Coxae and femora reddish yellow, the apices of the femora brownish above; coxae with fine yellow hair, the femora wholly black-haired; tibiae reddish brown; tarsi black; middle tibiae with a bristle below.

Wings cinereous hyaline, with brownish tinge. Squamae whitish with brown disc. Halteres yellow.

First abdominal segment reddish, the median black vitta; second segment reddish with the apical half or less blackish, the black fascia not nearly reaching the lateral edges of the tergites except in rare cases, usually ending a little below the lateral margins of the abdomen, third segment blackish with the sides and venter usually broadly reddish basally; fourth segment blackish with about the lower half reddish yellow. Second segment with about the basal fourth cinereous pollinose, the pollen expanding strongly on the median third and occupying about the basal half on the under surface; third segment with more than the basal half pale pollinose, the pollen expanding in the middle and the apex of the segment usually bearing a pale pollinose median spot; fourth segment pale pollinose with the vertical apex broadly brown. From ventral view the abdomen appears reddish yellow with black fasciae on the posterior borders of the second and third segments, that on the third segment usually absent on the median half or more. Hair black, pale on the under side of the first segment. First and second segments each with a pair of strong marginals, the third

<sup>1</sup>Curran, C. H., Amer. Mus. Bull., LXVI, Art 3, in press.

with a row, the fourth with finer bristles bordering the genital opening; second and third segments each with a pair of discals, the fourth with an arched row.

**TYPES.**—Holotype, female, Barro Colorado Island, Canal Zone, December 29, 1928. Paratypes: ten females, Barro Colorado Island, December 23, 29, 1928, and February 18, 1929 (Curran), and one female, November 20, 1930 (F. E. Lutz); 16 females, Barro Colorado Island, July 26, 1924 (N. Banks); one female, Higuito, San Mateo, Costa Rica (Pablo Schild).

***Calodexia caudata*, new species**

Antennae and legs and sides of the abdomen reddish yellow; wings tinged with brown; fourth abdominal segment elongate and bearing three transverse rows of strong bristles. Length, about 11 mm.

**MALE.**—Head densely white pollinose, the frontal vitta brownish. Front one-fourth as wide as either eye, with almost parallel sides on the upper half, gently widening on the anterior half; eight pairs of frontals, one situated below the base of the antennae, the upper two strong and reclinate and widely separated; ocellars very weak. Occiput white-haired, the black occipital cilia extending to somewhat below the middle of the eyes. Cheeks very narrow in profile, with fine white hair and a row of black bristles. Parafacials wide above, becoming linear below. Proboscis brown, the labellae and palpi reddish yellow, the palpi with short black hair above and pale hair below. Antennae reddish yellow; arista reddish brown, short plumose on the basal half.

Thorax black in ground color; mesonotum cinereous pollinose with a yellow tinge, with four black vittae, the median ones slender but expanded and fused behind the suture, the outer pair wider and interrupted at the suture, all ending far before the posterior border of the mesonotum. Hair and bristles black except on the outer edge of the humeri and the notopleural hairs. Pleura with white hair and black bristles. Acrosticals, 1-1; dorsocentrals, 3-3; three intra-alars; three pairs of marginal scutellars, the apicals absent.

Legs reddish yellow, the apices of the femora, the posterior tibiae and more or less of the bases of the femora, brownish; tarsi black. Hair black, the coxae with whitish hair, the posterior and middle femora with a row of short, rather dense ciliate yellow hair below.

Wings with brown tinge. Squamae whitish, with yellow border and yellow or fuscous tinge on the disc in some lights. Halteres yellow.

Abdomen brown, the two basal segments mostly reddish yellow. First segment brown basally, with a broad median vitta that expands posteriorly; second segment with somewhat more than the apical third and a rather narrow median vitta brown; third segment brown with a very broad, broadly interrupted basal reddish fascia. Pollen cinereous, dense, occupying almost the basal two-thirds of the second and third segments on the dorsum but narrowing laterally and ventrally, on the fourth segment covering the whole segment except the broad, brown pollinose apex and a narrow, incomplete median vitta. First and second segments each with pair of strong marginals, third and fourth each with a row; second and third segments each with a pair of discals, the fourth with two rows. Hair black, pale yellow on the under side of the first segment and on at least the basal sternites. Genitalia reddish.

**HOLOTYPE.**—Male, Cabima, Panama, May 18, 1911 (A. Busck), in U. S. N. M.



*Calodexia apicalis*, new species

Blackish; abdomen of male yellowish laterally; femora mostly reddish yellow; pleura black-haired. Length, 8 to 8.5 mm.

MALE.—Head white pollinose, the parafrontals and upper posterior orbits pale golden-yellow. Front two-sevenths as wide as either eye, narrowest in the middle, slightly widening above and below, the brown frontal vitta much narrower than either parafrontal; ten pairs of frontals, the upper two reclinate; ocellars very weak. Occiput with pale yellow hair, the black occipital cilia extending to the middle of the eyes. Cheeks very narrow, with a row of fine black bristles. Parafacials narrow, narrowing below, tinged with yellow on much of their length. Proboscis brown; labellae and palpi reddish yellow, the palpi with black hair. Antennae yellow, the basal segments more reddish; arista brown, almost bare, the base broadly yellowish.

Thorax cinereous pollinose, the dorsum with slight yellowish tinge. Black vittae in front of the suture reduced to narrow median stripes and a pair of spots, the post-sutural fascia entire but deeply emarginate above the wings. Scutellum with the base broadly blackish, bearing two pairs of strong marginals and a pair of apical hairs. Pile wholly black. Acrosticals, 1-1; anterior intra-alar very weak or absent.

Anterior coxae and the femora yellowish; anterior and posterior femora brown on the apical third, the middle pair on the apical half, the anterior femora pale on the whole length below; middle and posterior femora with rows of dense, short blackish hair on the apical half of both lower edges, the hair appearing golden brown in some lights. Middle tibiae with ventral bristle.

Wings cinereous hyaline. Squamae whitish, the disc tinged with brown. Halteres yellow.

Abdomen black and yellowish, with cinereous pollen. Second segment yellowish laterally, the black forming a posterior band that expands triangularly in the middle to reach the base broadly, and not reaching the lateral margins of the tergites; third segment yellowish on about the basal half laterally, the yellow bands tapering toward the middle of the dorsum and very widely separated; first segment mostly reddish below, the red color extending irregularly on to the dorsum. Pale pollen occupying about the basal fourth but expanding to one-half at the sides and to the apical fourth in the middle; pale pollen on third segment forming a broader basal band and similarly expanded; fourth segment pale pollinose with the apical third and more than the median third of the dorsum shining blackish. Hair entirely black. Genitalia reddish. First and second segments each with a pair of marginals, the third and fourth each with a row; second to fourth segments each with a pair of discals.

FEMALE.—Front half as wide as either eye, narrowest anteriorly; seven or eight pairs of frontals and two pairs of orbitals; parafrontals white on anterior half, yellowish above. Abdomen blackish, with cinereous-white pollen arranged as in the male, the chaetotaxy similar except that the apicals on the fourth segment are weaker. From ventral view the abdomen appears partly brownish red.

TYPES.—Holotype, male, allotype, female, Barro Colorado Island, Canal Zone, December 25, 29, 1928 (Curran). Paratype, male, Barro Colorado, May 13, 1926 (C. T. Greene), in U. S. N. M.

The paratype differs from the types in having the black postsutural fascia entirely interrupted above the roots of the wings.

*Calodexia panamensis*, new species

Black, with cinereous pollen; legs black; acrosticals, 2-3. Length, 4.5 to 7 mm.

MALE.—Front three-tenths as wide as either eye; parafrontals golden-yellow pollinose, about as wide as the brown frontal vitta; eight to eleven pairs of frontals, the lowest sometimes arising below the base of the antennae, the upper two strong and reclinate; ocellars very weak. Occiput yellow above, becoming cinereous pollinose below; black orbital cilia extending to, although weak just above, the cheeks; hair white. Cheeks very narrow, with fine black hair and bristles. Parafacials narrow and narrowing below. Proboscis brownish, the labellae and palpi reddish or reddish yellow; palpi with black hair apically. Antennae reddish, the third segment mostly brown; arista brown with reddish base, long pubescent on the basal half.

Mesonotum with ochreous or cinereous-yellow pollen, with four brown vittae, the median pair fused behind the suture where the stripes are only narrowly separated from the outer ones which are wide, interrupted at the suture, and extend well toward the scutellum. Hair and bristles black. Pleura with cinereous pollen and black hair. Acrosticals and dorsocentrals, 2-3; anterior intra-alar hairlike. Scutellum blackish basally, the apex concolorous with the mesonotum; three pairs of marginals and a pair of weak, divergent apicals.

Legs brown, the trochanters reddish; coxae cinereous pollinose and with black hair; middle tibiae with ventral bristle. Hair wholly black.

Wings with brown tinge. Squamae with brown tinge, the border and base yellow. Halteres yellow.

Abdomen brown and yellowish, the pollen yellow dorsally, becoming white ventrally. First segment brown, with indications of an interrupted preapical yellowish fascia dorsally, the under side becoming mostly yellow. Second segment yellowish with about the posterior half brown on the dorsum, the brown fascia tapering and not reaching the lateral edges of the tergites; third segment similar to the second but the brown band is wider dorsally and almost reaches the edges of the tergites on the under surface. Second and third segments with the basal third dorsally, expanding on the under surface, pale pollinose; fourth segment pale pollinose on the basal two-thirds. First and second segments with pair of marginals, the third and fourth with a row; second and third segments with pair of discals, the fourth with a row.

FEMALE.—Front about half as wide as either eye, white with yellowish tinge, the frontal vitta brown and about as wide as either parafrontal; seven to nine pairs of frontals; two pairs of orbitals; outer verticals developed but short. Occiput with yellow tinge on upper half. Thorax and scutellum more cinereous pollinose. Squamae whitish with only the disc tinged with brown. Abdomen blackish brown, the apices of the tergites yellowish on the under surface. Pollen cinereous, occupying about the basal third toward the middle of the second and third segments but triangularly expanded in the middle to reach almost to the apical fourth and expanded on the under surface to occupy the basal three-fourths. Fourth segment pale pollinose except the broad border surrounding the genital opening which is entirely ventral. Fourth segment bearing two rows of bristles, one on the basal third and the second forming an apical arch.

TYPES.—Holotype, male, allotype, female, Barro Colorado Island, Canal Zone, December 22 and 23, 1928. Paratypes: male and female, same data; two females, Closes, Cano Saddle, Canal Zone, May 2, 1923 (R. C. Shannon); male, Tabernilla, Canal Zone, (A. Busck) in U. S. N. M.

***Calodexia bequaerti*, new species**

Very similar to *panamensis*, new species, but readily distinguished by the darker antennae. Length, 5 to 5.5 mm.

**FEMALE.**—Head cinereous-white pollinose, the parafrontals tinged with yellow on the upper half, the posterior orbits with yellowish tinge above. Front about half as wide as either eye, the blackish frontal vitta slightly wider than either parafrontal; eight pairs of frontals, the anterior pair situated below the base of the antennae, the upper two pairs reclinate; two pairs of orbitals; ocellars rather short; outer verticals half as long as verticals. Occiput pale yellowish pilose, the black occipital cilia extending to the cheeks. Cheeks very narrow, with a row of black bristles. Para-facials very narrow and narrowing below. Proboscis brown, the labellae and palpi reddish yellow, the palpi with black hair. Antennae black, the basal segments brownish, the incisure between the second and third segments reddish.

Thorax black, with cinereous pollen; mesonotum with four black vittae, the median pair united behind the suture. Scutellum black on the basal half, with four pairs of marginals the apicals weak. Acrosticals, 2-3; anterior intra-alar weak. Hair wholly black.

Legs black; middle tibiae with bristle below; middle femora with two anterior bristles near the middle.

Wings cinereous hyaline, sometimes with brownish tinge. Squamae pale brownish, the rim and broad base white. Halteres pale yellow.

Abdomen black, with cinereous-white pollen. Second segment pale pollinose on a little less than the basal half above, the pale band expanded triangularly in the middle to reach the apex of the segment, and broadened on the under surface; third segment similarly pollinose; fourth segment pale pollinose, the pollen with brown tinge between the arched row of discals. First and second abdominal segments each with a pair of marginals, the third with a row; second and third segments each with a pair of discals, the fourth with an arched row of discals, a secondary row composed of four bristles within the arched row, and with weak bristles along the sides of the genital opening. Hair wholly black.

**TYPES.**—Holotype, female, and paratype, female, Moca Guatalon, Guatemala, 1000 m., March–April, 1931, and female paratype, Santa Emilia, Pochuta, Guatemala, February–March, 1931 (J. Bequaert).

This species has the pollen of the head much duller than *panamensis*, which has shining whitish pollen in the female, and the females appear to be slightly larger.

***Calodexia valera*, new species**

Rather similar to *panamensis* but the abdomen is much less yellowish, the anterior intra-alar is strong, etc. Length, 8 mm.

**MALE.**—Head white pollinose, the parafrontals with yellow tinge or yellowish; front scarcely half as wide as either eye, the frontal vitta brown; ten pairs of frontals, one below the base of the antennae, the upper two strong and reclinate; ocellars missing. Occiput with white hair, the black occipital cilia extending to the cheeks. Cheeks very narrow, with black hair and bristles. Para-facials narrow and narrowing below. Proboscis brown, the labellae reddish; palpi reddish yellow. Antennae reddish, the third segment mostly brown; arista brown, long pubescent basally.

Thorax cinereous pollinose, the mesonotum with four blackish vittae that unite behind the suture to form a rectangular, transverse bar that is widest in the middle and is slightly produced posteriorly at the outer corners. Scutellum brown with the margin broadly cinereous; four pairs of marginals (the apical pair broken off, but not stronger than the second pair). Acrosticals, 3-3; dorsocentrals, 2-3; three pairs of intra-alars, the anterior pair strong although weaker than the following ones. Hair wholly black.

Legs blackish; middle tibiae with a ventral bristle; coxae cinereous pollinose and bearing black hair; trochanters reddish. Hair wholly black.

Wings with brown tinge. Squamae light brownish, with pale border. Halteres yellow.

Abdomen brown, the sides of the second and third segments broadly yellow in ground color. First segment brown; second with the basal third yellowish at the sides, narrowing toward the middle of the dorsum and toward the ventral, lateral margins; third similar, but the yellow does not extend so far on to the dorsum. Pollen cinereous, covering the yellow ground on the second and third segments and extending entirely across the base of the segment on the basal third or fourth, the posterior portions of the segments brown pollinose. On the fourth segment the pale pollen occupies about the basal third. First and second segments with pair of marginals, the third and fourth each with a row; second and third segments with pair of discals, the fourth with a row. Hair entirely black.

HOLOTYPE.—Male, Valera, Venezuela, in U. S. N. M.

While this species is close to *panamensis* it is undoubtedly distinct because of the differences in color and chaetotaxy.

#### ***Calodexia varia*, new species**

Black, with cinereous pollen, the abdomen partly irrorate with dark spots; three pairs of postsutural acrosticals. Length, 8 mm.

FEMALE.—Head whitish pollinose, the parafrontals and upper part of the posterior orbits with ochreous tinge. Front about half as wide as either eye, narrowest anteriorly, the sides distinctly convex; frontal vitta black, narrower than either parafrontal; about eight pairs of frontals, the upper two reclinate, the lower one or two situated below the base of the antennae; ocellars well developed; outer verticals three-fourths as long as the verticals. Occiput with pale yellowish pile, the black occipital cilia extending to the cheeks. Cheeks narrow, with a row of black bristles. Parafacials narrow, tapering below. Proboscis brown; labellae yellow; palpi reddish yellow, their hair mostly black. Antennae brown, the base of the third segment broadly reddish, the basal segments brownish red; arista brown, with reddish base, very short plumose on the basal third.

Thorax cinereous pollinose, the dorsum rather ochreous. Mesonotum with four black vittae that extend almost to the scutellum, the median ones replaced on the posterior fourth by brown. Scutellum not black basally, with three pairs of marginals. Acrosticals, 1-3; three strong intra-alars. Hair wholly black.

Legs black, the trochanters and the knees very narrowly, reddish; middle femora with two anterior bristles near the middle; middle tibiae with ventral bristle.

Wings cinereous hyaline, with slight brown tinge. Squamae whitish with the entire disc of the lower lobe pale brown. Halteres yellow.

Abdomen black, with cinereous pollen. On the second and third segments the pale pollen extends to the marginal bristles and is irrorate with shining black spots on the dorsum that tend to fuse on the disc; fourth segment wholly pale pollinose, the bristles arising from darker spots; first segment with some pale pollen on the disc. First and second segments each with a pair of marginals, the third with a row; second and third segments each with a pair of discals, the fourth with a strong, arched row. Hair wholly black except on the basal sternites.

HOLOTYPE.—Female, Barro Colorado Island, Canal Zone, December 23, 1928 (Curran).

This is the species described by Dr. Aldrich as the female of *flavipes* Schiner (Proc. U. S. N. M., LXXIV, Art. 19, p. 23).

***Calodexia mexicana* Townsend**

*Oestrogastropsis mexicana* TOWNSEND, 1915, Proc. U. S. N. M., XLIX, p. 424.

I have no representatives of this species before me but I have examined the type. The species is somewhat similar to *varia* but has two pairs of presutural acrostical bristles.

