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REVISION OF THE AMERICAN TWO-WINGED FLIES
BELONGING TO THE GENUS CUPHOCERA

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IN THE preparation of this paper I have studied the material in the United States National Museum and the Kansas University Museum, besides my own collection mainly from Texas, and a few specimens from Washington and California. I am under obligations to the late Dr. J. M. Aldrich for the privilege of examining the National Museum material, which includes the types of most previously described forms, and also for his cooperation in supplying references and notes on types not seen by me. To Dr. R. H. Beamer I am indebted for the opportunity of studying the material in the Kansas University Museum collection, which contained several undescribed forms from Western and Southwestern United States. My thanks are due also to J. Wilcox and Charles H. Martin, who generously lent specimens for study from their private collections of west-coast flies.

Sixteen species are characterized in this revision; of this number, 10 are new to science. The types of the new species are deposited in the United States National Museum and the Kansas University Museum.

Genus CUPHOCERA Macquart

Cuphocera MACQUART, Ann. Soc. Ent. France, 1845, p. 267. (Genotype, *Micropalpus ruficornis* Macquart.)—SCHINER, Fauna Austriaca, vol. 1, p. 427, 1862.—VAN DER WULP, Biologia Centrali-Americana, Diptera, vol. 2, p. 35, 1888; *ibid.*, p. 475, 1903.—BRAUER and BERGENSTAMM, Die Zweiflügler des

kaiserlichen Museums zu Wien, no. 4, p. 133, 1889; *ibid.*, no. 6, p. 144, 1893.—COQUILLETT, Revision of the Tachinidae of America, p. 140, 1897.—ALDRICH, Catalogue of North American Diptera, p. 483, 1905.—ADAMS, in Williston's "Manual of families and genera of North American Diptera," ed. 3, p. 377, 1908.

Palpibraca RONDANI, Ann. Nat. Napoli, 1845, p. 22 (Genotype, *P. haemorrhoea*, new species=*Micropalpus ruficornis* Macquart); Dipterologiae Italicae Prodromus, vol. 1, p. 63, 1856; *ibid.*, vol. 3, p. 60, 1859.

Spanipalpus TOWNSEND, Smithsonian Misc. Coll., vol. 51, p. 110, 1908. (Genotype, *Trichophora miscelli* Coquillett.)

Deopalpus TOWNSEND, *Idem.* (Genotype, *D. hirsutus*, new species.)

Epicuphocera TOWNSEND, Rev. Mus. Paulista, vol. 15, p. 240, 1926. (Genotype, *E. andina*, new species.)

The type species of all the above genera have been examined in the United States National Museum. The genotype, *Micropalpus ruficornis* Macquart (of Europe), differs from most of our species in possessing rudimentary palpi but slightly larger than in *australis* and *incongrua*, the only American species showing any development of these organs. The occurrence of rudimentary palpi and the absence of ocellar bristles in the genotype are characters of doubtful generic importance. Townsend has proposed the genus *Deopalpus* for *hirsuta*, which has neither palpi nor ocellars, and *Spanipalpus* for *miscelli*, which differs from the genotype, *ruficornis*, in possessing ocellar bristles but no palpi. These characters are subject to some variation within species of this group and are too slight to maintain the last mentioned genera or *Epicuphocera*, which has been proposed on even less important distinctions.

The generic characters of *Cuphocera* as considered herein are as follows: Propleura and eyes bare; head at vibrissae as long as the antennal axis; face somewhat bulging at middle, its ridges flat and bare; parafacial broad, haired and bearing one or more stout bristles on lower part; front broad and two pairs of verticals present in both sexes; frontal bristles in two rows on widest part of parafacial in the male; ocellars absent in *buccata*, *torosa*, *fucata*, *contigua*, *andina*, and usually in *hirsuta*, present in the other known species; proclinate orbital bristles present in all females and the male of *incongrua*; arista thickened on most of its length, penultimate segment long, not geniculate; vibrissae situated considerably above lower edge of head about on level with mouth; proboscis approximating the height of head; palpi rudimentary or entirely absent; cheek usually three-fourths the eye height. Thoracic chaetotaxy varying somewhat with the species and furnishing several good characters for separating the forms; three sternopleurals invariably present and usually with three postsutural dorsocentrals; scutellum with two to four marginal bristles besides a smaller apical pair. Abdomen generally broader and more robust in female, ovi-

positor short, fleshy and retracted; genitalia of the male with a large platelike lobe on the side, inner forceps united, the outer ones uniformly slender. Legs ordinary in length; hind tibiae with a scattered row of uneven bristles on outer posterior margin; intermediate fore tarsal segments sometimes dilated in the female with the pulvilli short, but moderately enlarged in the male sex. Wings uniform in shape, third vein setulose one-half or more the distance to small cross vein; first posterior cell open far before the wing tip; hind cross vein oblique to fourth, which it joins much nearer the bend than small cross vein; last section of fifth vein usually less than one-half the length of preceding section; costal spine small or vestigial.

Specific characters.—The American species of *Cuphocera* separate into two groups on the presence or absence of ocellar bristles. The characters that seem most useful in separating the species are the color of the pleural and parafacial hairs, ground color of the parafrontals, and thoracic chaetotaxy. The structure of the male genitalia is quite distinctive for a number of forms. The width of the front in relation to the total head width appears uniform within narrow limits for most species, and details of the frontal bristles furnish several additional minor points, especially in the male, that are of some service in distinguishing the forms. Minute or rudimentary palpi are present in only two of the known American species. In the female the genitalia appear uniform in structure; the ovipositor is short, fleshy, and retracted.

There are three genera closely related to *Cuphocera*: *Copecrypta* Townsend, aside from its slender build, is distinguished mainly by the characteristic transverse or erect apical cross vein; *Chiloepalpus* Townsend differs most obviously in having the propleura haired; and *Peleteria* Desvoidy has about the same combination of external characters, except that the palpi are well developed.

Very little is known concerning the biology of the species belonging to *Cuphocera*. The few rearings recorded indicate that the species are parasitic mainly on lepidopterous larvae.

KEY TO SPECIES OF CUPHOCERA

- 1. Ocellars present----- 2.
- Ocellars absent----- 9.
- 2. Pleura clothed with pale hairs----- 3.
- Pleura wholly black haired----- 5.
- 3. Cheek two-thirds to four-fifths the eye height----- 4.
- Cheek one-third the eye height, with silvery pollen which is distinctly tinged with yellow; parafacial hairs white; third antennal segment strikingly enlarged, subtriangular, three times as long as second (Brazil)----- (3) macrocera (Wiedemann).

4. Parafacial hairs black; third antennal segment widest near apex with anterior margin straight, hardly longer than second segment; parafrontals without any large bristles outside main row (California)----- (1) *miscelli* (Coquillett).
 Parafacial hairs white; third antennal segment strongly convex on anterior margin and distinctly exceeding length of second; a secondary row of frontal bristles outside main row on widest part of parafrontal (Texas, Arizona)---- (2) *parksi*, new species.
5. Palpi absent ----- 6.
 Minute palpi present; parafrontals black, subshining; face, cheeks and beard golden; apex of fourth abdominal segment orange-yellow (Chile)----- (7) *australis* (Townsend).
6. Scutellum with three or four marginal bristles----- 7.
 Scutellum with only two marginals; third antennal segment slightly convex or almost straight on front edge; frontal stripe narrower than one parafrontal on upper half; fourth abdominal segment red above on apical third to half (Arizona, California)----- (4) *scutellaris*, new species.
7. Fourth abdominal segment red at least on upper surface----- 8.
 Fourth abdominal segment black; frontal stripe wider than one parafrontal on entire length; cheek three-fourths eye height; inner forceps of male genitalia moderately long, slender on apical half with a raised median line behind (Arizona).
 (5) *conformis*, new species.
8. Abdomen black, anal segment wholly red and sharply contrasted with preceding ones; parafrontals pale or yellow in ground color, thinly pollinose; front about one and one-half times width of eye (United States, Mexico)-- (11) *hirsuta* (Townsend).
 Abdomen broadly red on sides, fourth segment entirely concolorous above; ground color of parafrontals obscured by rather dense gray pollen except at vertex; front approximating twice width of eye; apical segment of proboscis unusually slender and about equal to height of head (California)----- (6) *geminata*, new species.
9. Palpi absent ----- 10.
 Rudimentary palpi present; four postsutural dorsocentrals (Texas, Arizona)----- (16) *incongrua*, new species.
10. Cheeks clothed with black hairs or bristles----- 11.
 Cheeks wholly pale haired, about one-third eye height; femora yellow; intermediate fore tarsal segments in female broadly dilated (Cuba)----- (9) *buccata*, new species.
11. Three dorsocentral bristles ----- 12.
 Four dorsocentrals; male with orbital bristles.
 (16) *incongrua*, new species.
12. Epaulets reddish or yellow----- 13.
 Epaulets black; scutellum red, bearing four marginals of unequal size, disk with 10 or 12 erect bristles besides a reclinate discal pair; fourth abdominal segment black tinged with red above on basal margin; parafrontals black in ground color before vertex; inner forceps of male genitalia strongly bowed forward (Oregon, California)----- (15) *torosa*, new species.

13. Parafrontals entirely pollinose, yellow in ground color at least on upper part----- 14.
 Parafrontals shining black; scutellum black, with three marginal bristles; third antennal segment but slightly longer than second; cheek three-fourths the eye height (Mexico).
 (13) *fucata* (Van der Wulp).
14. Three sternopleural bristles ----- 15.
 Four sternopleurals; inner forceps of male genitalia laterally compressed at base and unusually narrow (California).
 (14) *beameri*, new species.
15. Third antennal segment largely black; front pulvilli of male normally elongate----- 16.
 Antennae entirely bright yellow; front pulvilli of male small hardly half entire length of apical tarsal segment (Arizona).
 (8) *flavicornis*, new species.
16. Parafrontals thinly pollinose with yellow ground color distinctly apparent ----- 17.
 Parafrontals with dense gray pollen obscuring ground color, which is usually blackish except near vertex; scutellum red, with four marginal bristles; abdomen broadly red on sides in male, intermediate segments black in female with fourth wholly red and contrasting sharply with preceding ones (United States, Canada)----- (10) *contigua*, new species.
17. Scutellum with four marginal bristles of unequal size; parafacial bearing two macrochaetae on lower part; cheek sparsely clothed with fine black hairs----- (11) *hirsuta* (Townsend).
 Scutellum with three marginal bristles; parafacial bearing only one stout bristle; cheek at middle with three or four moderately large bristles and a few scattered short hairs (Peru).
 (12) *andina* (Townsend).

(1) CUPHOCERA MISCELLI (Coquillett)

Trichophora miscelli COQUILLET, Revision of the Tachinidae of America, p. 139, 1897.—ALDRICH, Catalogue of North American Diptera, p. 483, 1905.

Spanipalpus miscelli TOWNSEND, Smithsonian Misc. Coll., vol. 51, p. 110, 1908.

Pleura clothed with pale hairs; ocellar bristles well developed; scutellum with only two lateral bristles; palpi absent.

Female.—Front wide, at vertex 0.41 of the head width in the one specimen; parafrontals thinly gray pollinose; median stripe yellow, about as wide as one parafrontal; verticals two pairs, large, inner ones decussate; orbitals two pairs, proclinate; frontals about eight in a single row, which diverges toward the eye on parafacial, descending almost to level with apex of second antennal segment, uppermost two or three bristles reclinate; antennae red, third segment broadened apically, the anterior edge straight, about equal the length of second; arista thickened on proximal two-thirds, penultimate segment about one-fourth as long as the third; face silvery, somewhat bulging at middle, in profile concave below the middle, the front edge of mouth

prominent between the vibrissae; facial ridges flat, bare; parafacials about two-fifths the width of face, with one strong bristle on lower part and black hairs extending upward to lowermost frontals; proboscis rather slender, the apical segment exceeding the height of head; labella small; cheek silvery, clothed with black hairs, about three-fourths the eye height; back of head convex in profile, gray pollinose, clothed with whitish hairs.

Thorax black, gray pollinose; pleura clothed with pale hairs; mesonotum marked with four black stripes; scutellum yellow beyond middle, gray pollinose. Chaetotaxy: Humeral, 5; posthumeral, 2; presutural, 2; notopleural, 2; acrostichal, 3, 3; dorsocentral, 3, 3; intraalar, 3; supraalar, 3; postalar, 2; sternopleural, 2, 1; pteropleural, 2 (broken off scars large). Scutellum with 2 lateral, 1 smaller decussate apical, and a still smaller discal pair; postscutellum normally developed, gray pollinose; calypters opaque, white.

Abdomen rather narrow, black, the sides and apex reddish; covered with changeable gray pollen, which in most views extends to the hind margins of the intermediate segments and to the middle of the fourth; first segment without median marginal bristles; second with one pair, large; third with one pair and three at the side; fourth with an arcuate row of large discals besides a row of smaller marginals.

Legs (only the hind pair present on type specimen) black, the basal segments and tibiae reddish yellow; hind tibiae with a row of irregular bristles on outer posterior side.

Wings grayish hyaline, tinged with yellow along the costa; third vein bristly almost to small cross vein; fourth with a rectangular stumpless bend, beyond which it is concave, thence straight in an oblique angle toward costa; epaulets yellow; costal spine vestigial.

Length, 9 mm.

Male.—Unknown.

Type.—Female, U.S.N.M. no. 3645.

Remarks.—Redescribed from one female (type) specimen in the United States National Museum, reared from a chrysalis of *Adisophanes miscellus* in Los Angeles County, Calif., by A. Koebele.

Although the single type specimen was described 37 years ago, no additional material has come to light during this period. The black parafacial hairs readily distinguish the species from both *macrocera* and *parksii*. Other differences are mentioned in the key.

(2) *CUPHOCERA PARKSI*, new species

Male.—Front rather broad, at vertex 0.402 of the head width (average of five, 0.39; 0.4; 0.4; 0.42; 0.4); parafrontals gray pollinose and clothed with intermixed black and white hairs; median stripe pale reddish yellow, narrower than one parafrontal on most of its

length; two pairs of large verticals, inner ones decussate, the outer curving backward and outward; frontals in two irregular rows, the inner or main row extending below the middle of second antennal segment and diverging toward the eye, all except the uppermost one or two pairs directed inward, the latter reclinate; ocellar bristles well developed, proclinate; orbitals absent; face including cheeks pale in ground color, with white subshining pollen; parafacial rather broad, bearing a single stout bristle near the lower corner of eye (in one specimen two, but the lower one small) and sparsely clothed with pale or whitish hairs; face transversely rounded or bulging at middle, in profile concave above mouth which is moderately protuberant, its ridges flat, bearing two or three bristles above the vibrissae; the latter situated about on level with oral margin; cheek about two-thirds the eye height, clothed with fine pale and coarser black hairs; proboscis distinctly exceeding the height of the head, apical segment slender, shining brownish black, labella small; palpi absent; antennae three-fourths the length of face, largely red, third segment unusually broad, strong convex on the anterior margin and about one and one-half times the length of second segment; arista blackish, thickened and tapering toward tip, penultimate segment long, the apical one pubescent and somewhat flattened near base; back of head gray pollinose and densely clothed with white hairs.

Thorax black; mesonotum gray pollinose, marked with four broad black stripes which extend almost to base of scutellum; prosternum bare; pleura gray pollinose, clothed with fine pale hairs; scutellum reddish on apex, covered with changeable gray pollen. Chaetotaxy: Humeral, 4 or 5; posthumeral, 2; notopleural, 2; presutural, 2; acrostichal, 3, 3; dorsocentral, 3, 4; intraalar, 3; supraalar, 3; postalar, 2; pteropleural, 2; sternopleural, 2, 1; scutellum bearing two large lateral, a much smaller suberect decussate apical, and a discal pair; postscutellum normal; calypters opaque, white.

Abdomen rather slender, subshining, black, the sides and apex reddish with rather thin changeable gray pollen, which extends to the hind margins of the intermediate segments; first segment pollinose above, without median marginal bristles; second with a stout pair; third bearing a median pair and three at the side; fourth segment with three irregular rows on apical half; venter gray pollinose, black-haired with pale pile on basal segment; genitalia yellow, with the usual large lobe on the side; the united inner forceps short, clothed with black hairs on base behind, laterally compressed or very thin on about apical third, in profile view uncommonly thick to apex which is broadly rounded; outer forceps blackish, with a large triangular projection near base behind, rather slender beyond and in rear view strongly bowed; penis short, the apex broadly expanded; fifth ster-

nite yellowish, with a moderately broad but not very deep U-shaped incision.

Legs black, lower edge of femora, knees and tibiae reddish; middle tibia with four or five stout uneven bristles on outer front side; hind tibia with about seven smaller bristles on outer posterior edge, the middle one largest; claws and pulvilli shorter than apical tarsal segment.

Wings grayish hyaline; epaulets yellow; third vein setulose almost to small cross vein; fourth vein with a rectangular bend which sometimes bears a short stump, beyond the angle the vein curves inward, thence continues straight in a diagonal direction to costa, narrowly closing first posterior cell far before tip of wing; hind cross vein very oblique to fourth which it joins much nearer bend than small cross vein; last section of fifth vein less than half the length of preceding section; costal spine vestigial.

Length, 10 to 12 mm.

Type.—Male, U.S.N.M. no. 50558, from Bexar County, Tex.

Remarks.—Described from nine males. In my collection eight specimens from Texas as follows: 1, Marathon, April 13, 1922 (C. S. Rude); 2, Moore, June 7, 1922 (C. S. Rude); 4, Bexar County, February 2, March 5, and April 4, 1923 (H. B. Parks); and 1, Brewster County, reared August 15, 1930, at San Antonio by H. B. Parks, from an unknown lepidopterous larva. In the Kansas University collection, 1 male, from Mescal, Ariz., July 28, 1927 (R. H. Beamer). Named for H. B. Parks, who has donated many specimens of Diptera from the vicinity of San Antonio.

(3) CUPHOCERA MACROCERA (Wiedemann)

Tachina macrocera WIEDEMANN, Aussereuropäische zweiflügelige Insekten, vol. 2, p. 290, 1830.

Cuphocera macrocera SCHINER, Reise der österreichischen Fregatte *Novara*, Zool. Theil, Diptera, p. 330, 1868.

Etachipalpus macrocera BRAUER and BERGENSTAMM, Die Zweiflügler des kaiserlichen Museums zu Wien, no. 5, p. 406, 1891.

Cuphocera macrocera ALDRICH, Proc. U.S. Nat. Mus., vol. 79, art. 19, p. 24, fig. 1, 1929.

Spanipalpus aldrichi TOWNSEND, Revista Ent., vol. 1, p. 168, 1931.

The supposed male type, from Brazil, is in the Vienna Natural History Museum. Aldrich has given a complete description of the specimen, with a figure of the head, which is readily accessible. The unusually large, subtriangular third antennal segment readily distinguishes the species from all other members of the genus. Since Wiedemann's specific name applies to antennae of uncommon size, hardly any doubt remains that the specimen represents his true type.

The species, according to Greene's figure, differs from *miscelli* and *parksii* in having the cheek barely one-third the eye height. Other

differences are mentioned in the key and descriptions. The species is not represented in the United States National Museum, and I have not seen the single type specimen.

(4) CUPHOCERA SCUTELLARIS, new species

Male.—Front narrower than usual, before vertex 0.322 of the head width (average of five, 0.32; 0.33; 0.31; 0.33; 0.32), widening rapidly below; parafrontals black, covered with dense dull gray pollen to vertex; frontal stripe yellow, narrowed toward triangle and at middle hardly as wide as one parafrontal; ocellars well developed; verticals two pairs, inner ones decussate and the outer divaricate; frontal bristles about nine in a row, the upper one largest, suberect and slightly divergent, the lower one at middle of parafacial near level with middle of second antennal segment; a secondary row of four or five frontals outside the main row on widest part of front; face and cheeks yellow in ground color, covered with lusterless pale grayish-white pollen; parafacial black haired, with three or more moderately large bristles in a row on lower half nearest the eye; face with the lower border protuberant, its ridges flat bearing three or four bristles next to the vibrissae; basal segments of antennae red or yellow, the third black except at base, weakly convex or almost straight in front, distinctly longer than second segment; arista black, short, tapering uniformly to tip, penultimate segment elongate; cheek clothed with rather sparse longish black hairs, about three-fourths the eye height; proboscis rather slender, apical segment shining brown, tapering outward from base, labella small; palpi absent; back of head thickly pale haired.

Thorax gray pollinose and when viewed from the rear with four broad subshining black stripes, the outer ones interrupted at the suture; pleura black haired; scutellum red at apex, dusted with gray pollen. Chaetotaxy: Acrostichal, 2, 3; dorsocentral, 3, 3; intraalar, 2 (none near suture); supraalar, 3; postalar, 2; presutural, 2; notopleural, 2; humeral, 4; posthumeral, 3; pteropleural, 2; sternopleural, 2, 1; scutellum with 2 marginal, a smaller decussate apical, and a still weaker reclinate subdiscal pair; postscutellum black, dusted with gray pollen; calypters opaque, white.

Abdomen reddish on the sides and apex above, subshining, with thin gray pollen, which is changeable in different angles of view; first segment without median marginal bristles; second bearing one pair; third with a marginal row of about 12; fourth with numerous bristles above on apical half or more; intermediate segments without discal bristles; genitalia reddish with the usual large platelike lobe on the sides; inner forceps rather long and united with a slightly raised median line behind, base flat, moder-

ately wide tapering outward to a slender apex; outer forceps with a square shoulder near the base behind, beyond this moderately slender and bowed inward when viewed from the rear, tips blunt, shining black; fifth sternite deeply divided, the lobes bearing numerous long black hairs.

Legs black, tibiae obscurely reddish; middle tibiae with two large bristles on outer front side; hind tibiae with a scattered row of about five uneven bristles on outer posterior edge, one or two bristles situated near the middle in front and three on the inner hind margin; pulvilli tawny, the front pair noticeably longer and slightly exceeding the length of the last tarsal segment.

Wings gray-hyaline; fourth vein with an obtuse angular bend, slightly curved inward beyond, thence straight in a diagonal direction gradually narrowing the first posterior cell which is open far before the wing tip; third vein setulose more than halfway to small cross vein; last section of fifth vein about one-fourth the length of preceding section; epaulets obscurely reddish; costal spine vestigial.

Female.—Front at vertex 0.375 of the head width (one specimen); frontal bristles in a single row; two proclinate orbitals present; third antennal segment rather narrow, almost three times as long as broad; median frontal stripe narrower than one parafrontal on entire length; abdomen broadly ovate; first segment with the hind margin rather strikingly oblique at the sides, narrowing the lateral length of the second segment to about two-thirds its median dorsal length; genital opening broadly rounded behind and narrowed in front, ovipositor short, retracted; claws and pulvilli shorter than apical tarsal segment.

Length, 8 to 10 mm.

Type.—Male, U.S.N.M. no. 50559.

Remarks.—Described from 5 males and 1 female. In the United States National Museum 2 males, including the type, from Cherry Creek Buttes, Ariz., September 21 (C. H. T. Townsend). In Charles H. Martin's collection, 3 males and 1 female, Monrovia Canyon, Calif., October 1929 and September 1931 (C. H. Martin).

(5) *CUPHOCERA CONFORMIS*, new species

Very similar to *hirsuta* but slightly larger; front in male at vertex 0.339 of the head width in the one specimen; parafrontals gray pollinose to vertex; median stripe yellow, wider than one parafrontal on most of its length; verticals two pairs, strong, the inner ones decussate as usual; orbitals absent; ocellars well developed; frontal bristles extending to middle of second antennal segment, bordered by a secondary row on widest part of front; face with dense grayish-white pollen, the lower border rather prominent in

profile, its ridges flat and practically bare; vibrissae about on level with oral margin well above the lower edge of head; parafacial nearly half as wide as face, bearing two large bristles on lower part and with coarse black hairs above extending to the lowermost frontals; antennae red at base; arista moderately thickened and tapering toward tip, penultimate segment long; cheek gray pollinose, clothed with black hairs, about three-fourths the eye height; proboscis slender and somewhat exceeding the height of head; palpi absent; beard dense, pale gray or white. Thoracic chaetotaxy as in *hirsuta*.

Abdomen wholly black, with rather thin changeable gray pollen on last three segments; second segment with a pair of median marginal bristles; third bearing a marginal row; fourth with numerous bristles on apical half; no discals on intermediate segments; genitalia with the usual large lateral lobe; inner forceps moderately long, united, with a narrow slightly raised median line behind, tapering from the base to an acute tip; outer forceps slender beyond a rather prominent shoulder near the base behind; fifth sternite cleft, the lobes clothed with black hairs.

Legs black, the tibiae obscurely yellow; middle tibia with four or five strong bristles on the outer front side; hind tibia bearing a row of uneven bristles on the outer posterior edge; claws and pulvilli moderately elongate.

Wings gray-hyaline; venation normal, third vein setulose about half the distance to small cross vein; costal spine small.

Length, 12 mm.

Female.—Unknown.

Type.—Male, U.S.N.M. no. 50560.

Remarks.—Described from one specimen in the United States National Museum from East Verde River, Ariz., 4,500 feet, without collector's label.

(6) CUPHOCERA GEMINATA, new species

Male.—Front at vertex 0.44 of the head width (one specimen), widening gradually to antennae; parafrontals yellow with gray pollen extending to vertex; median stripe reddish yellow, narrower than one parafrontal on entire length; ocellar bristles present, rather weak; verticals two pairs, large; frontal bristles seven or eight in the row, the upper two largest, reclinate and divaricate, the lower one about on level with middle of second antennal segment; a secondary row of three frontal bristles outside the lower part of main row; face and cheeks yellow in ground color, grayish-white pollinose; antennae red, third segment largely dark, strongly convex in front and a little longer than the second; arista short, thickened and evenly tapering to tip, the penultimate segment about one-fourth the length of third; parafacial black haired and with two strong bristles close

to eye on lower part; face somewhat bulging at middle with the lower edge protuberant, its ridges flat and bare; cheek sparsely black haired, four-fifths the eye height; apical segment of proboscis more slender than in the other members of the group, about three-fourths the height of head; back of head gray pollinose clothed with gray hairs.

Thorax marked with four narrow dark stripes, which are poorly defined behind the suture; pleura black haired; scutellum red on apical half, dusted with gray pollen. Chaetotaxy: Acrostichal, 2, 3; dorsocentral, 2, 3; intraalar, 3; supraalar, 3; postalar, 2; humeral, 5; posthumeral, 2; notopleural, 2; presutural, 2; pteropleural, 2; sternopleural, 2, 1; scutellum with 4 marginals (one nearest base small) and a decussate apical pair; postscutellum gray pollinose; calypters opaque, white.

Abdomen red, the venter and narrow hind margin of third segment black, a broad obscure dark median stripe on the intermediate segments; the pollen gray, rather thin and changeable when viewed in different angles; first segment without median marginals; second with one pair and three at the side; third with a marginal row of about 10; fourth bristly on the apical half above; intermediate segments without discals; inner forceps short, united, and tapering sharply from base to apical third, the apex narrow and strongly convex behind; outer forceps nearly straight when viewed from behind, evenly tapering, shining black beyond the base; fifth sternite deeply incised, the lobes black, sparsely clothed with black hairs.

Legs black, tibiae largely yellow; pulvilli grayish, shorter than apical tarsal segment; mid tibia with two large bristles on outer front side.

Wings gray-hyaline; fourth vein with a rectangular stumpless bend, shortly beyond which it curves outward continuing in an oblique direction toward costa, narrowing the first posterior cell which is open far before the tip of wing; third vein with a series of bristly hairs extending over halfway to small cross vein; last section of fifth vein about one-fourth the preceding section; epaulets red; costal spine not developed.

Length, 8.5 mm.

Female.—Unknown.

Remarks.—Described from one male specimen labeled Delfrey, Calif., December 27, 1930 (C. H. Martin); received from Charles H. Martin, to whom it is returned.

The wider front and the presence of marginal bristles on the sides of the second abdominal segment readily distinguish the species from all the other forms possessing ocellar bristles.

(7) CUPHOCERA AUSTRALIS (Townsend)

Spanipalpus australis TOWNSEND, Rev. Chilena Hist. Nat., vol. 31, p. 164, 1927.

Closely resembles *Chiloepalpus (Cuphocera) aurea* Aldrich, but differs in having the propleura bare and no discal bristles on the intermediate abdominal segments.

Female.—Front at extreme vertex 0.327 of the head width in the one specimen, widening rapidly to base of antennae; parafrontals black, subshining, lightly dusted with plumbeous pollen; ocellars well developed; verticals two pairs, inner ones decussate the outer divergent; orbital bristles two, proclinate; frontals about nine arranged in a single row, moderately large, the lower one close to eye about on level with middle of second antennal segment; parafacial yellow, this color sharply limited along the lower frontals and black upward, black haired with a single stout bristle on lower part; front edge of mouth strongly protuberant, face yellow, with thin subshining pale pollen, its ridges flat, bearing two or three bristles next to the vibrissae; basal segments of antennae deep yellow, the third largely black and obliquely truncate at apex, slightly exceeding the length of second segment; arista brownish black, third segment flattened near base, pubescent, penultimate segment long; cheek yellow, thinly pollinose and clothed with long black hairs, about two-thirds the eye height; proboscis moderately stout, distal segment slightly tapering toward tip, shining brownish black; minute or rudimentary palpi present, yellowish, bearing several black hairs; back of head with a ruff of golden hairs which are sparser and somewhat paler on the upper part.

Thorax black, gray pollinose; mesonotum marked with four black stripes; pleura black haired; scutellum black and subshining, lightly dusted with gray pollen. Chaetotaxy: Humeral, 5; posthumeral, 2; notopleural, 2; presutural, 2; acrostichal, 3, 3; dorsocentral, 3, 4; intraalar, 3; supraalar, 3; postalar, 2; pteropleural, 2; sternopleural, 2, 1; scutellum with two marginal and a smaller slightly upturned decussate apical pair, disk sparsely haired, bearing a wide-spaced discal and a more closely approximated subapical pair; postscutellum black, thinly pollinose, pale membranous above; calypters opaque, white, the rims faintly tinged with yellow.

Abdomen shining black, with thin gray pollen, apex of fourth segment bright yellow, this color extending forward on the median line about to basal third; first segment without median marginals; second bearing a rather long stout pair; third with a row of about 12, with wider space between the median and the next bristle toward the side; fourth with a pair of discals situated before the middle and numerous bristles behind these on apical half; intermediate segments

without discals; genital opening moderately large and elongate, ovipositor short, retracted.

Legs black, tibiae obscurely reddish; middle tibia with four or five large bristles on outer front side; fore tarsal segments somewhat flattened but not noticeably enlarged; claws and pulvilli shorter than last tarsal segment.

Wings gray-hyaline; fourth vein with a rounded rectangular stumpless bend; third vein haired almost to small cross vein; first posterior cell open far before the exact tip of wing; hind cross vein oblique to fourth, joining it at less than one-third the distance from bend to small cross vein; last section of fifth vein obviously less than one-half as long as the preceding section; epaulets reddish; costal spine not developed.

Length, 10 mm.

Male.—Unknown.

Remarks.—Described from one female specimen in the United States National Museum labeled Puerto Blest., Chile, December 2, 1926 (Shannon).

The type, a female, is in the experiment station at Lima, Peru; I have not seen it.

(8) *CUPHOCERA FLAVICORNIS*, new species

Male.—Front at extreme vertex 0.413 of the head width in the one specimen, widening gradually downward; parafrontal rather broad, densely gray pollinose and distinctly wider than the yellow middle stripe; ocellar bristles absent; verticals large, the inner pair decussate and the outer ones divergent; orbitals none; frontals about seven in the main row with the lowermost bristle situated near the eye well below the middle of second antennal segment, the two uppermost bristles strongly divaricate and reclinate, with two supplementary bristles on widest part of front outside the main rows; entire face including cheeks pale in ground color with uniform dense silvery pollen; antennae entirely bright yellow, third segment about twice as long as wide with the apex broadly rounded on front side; second segment about two-thirds the length of third; arista brown, moderately thickened and tapering to tip, penultimate segment elongate; parafacial with about six small black hairs extending along the margin of eye and two larger bristles on the lower part; face slightly bulging at middle, the lower border moderately protuberant, its ridges flat with one or two bristles above the vibrissae; proboscis somewhat exceeding the height of head, apical segment rather thick at base tapering to tip, labella small; palpi absent; cheek with sparse black hairs, about four-fifths the eye height; back of head gray pollinose faintly tinged with yellow above, clothed with dense pale hairs.

Thorax black, gray pollinose, marked with four distinct black dorsal stripes; pleural hairs black; scutellum red, dusted with uniform gray pollen. Chaetotaxy: Acrostichal, 2, 3; dorsocentral, 3, 3; humeral, 6; posthumeral, 2; notopleural, 2; presutural, 2; intraalar, 3; supraalar, 3; postalar, 2; pteropleural, 2; sternopleural, 2, 1; scutellum with 4 marginal bristles (the basal one small), besides a suberect decussate apical and a reclinate discal pair of nearly equal size, numerous erect bristly hairs on disk; postscutellum normally developed, gray pollinose; calypters opaque, white.

Abdomen reddish on sides of intermediate segments, the fourth entirely so; with rather uniform gray pollen extending to the hind margins of segments two to four; first segment pollinose on the sides above, without median marginal bristles; second with a stout pair; third bearing a marginal row of about 10; fourth with numerous bristles on apical half; no discals on intermediate segments; genitalia yellow; inner forceps moderately broad at base with a slight median groove behind, united and tapering to tip; outer forceps as usual, brownish black; fifth sternite with a broad V-shaped incision, the lobes blackish bearing a few hairs along the inner margin.

Legs black; middle tibia with a row of five or six large bristles on outer front side; hind tibia with a scattered row of uneven smaller bristles on outer posterior edge and others on the inner side; claws and pulvilli distinctly shorter than the apical tarsal segment.

Wings grayish hyaline; fourth vein with a rectangular bend which bears a short stump, concave immediately beyond the angle thence slightly undulating in an oblique direction to costa; first posterior cell open far before the wing tip; third vein setulose nearly to small cross vein; last section of fifth vein two-fifths the length of preceding section; epaulets reddish; costal spine small.

Length, 9.5 mm.

Female.—Unknown.

Holotype.—Male, in the Kansas University Museum.

Remarks.—Described from one male specimen taken in Pima County, Ariz., July 27, 1927, by R. H. Beamer.

The species resembles *parksi*, from which it differs most obviously in having no ocellars; the hairs on pleura, cheeks, and parafrontals are entirely black; the parafacials with two stout bristles on lower part and a few scattered inconspicuous black hairs. The genitalia show additional differences.

(9) CUPHOCERA BUCCATA, new species

Differs from all other species in having the cheeks wholly pale haired. The intermediate fore tarsal segments are broadly dilated in the female sex.

Female.—Front at extreme vertex 0.311 of the head width in the one specimen; median stripe reddish yellow, narrowed uniformly toward triangle, at base of antennae about as wide as one parafrontal; sides of front thinly gray pollinose to vertex, blackish in ground color; ocellar bristles absent; inner verticals moderately large and reclinate, outer ones a little smaller, divergent; frontal bristles about seven in a single row, descending hardly to the middle of second antennal segment, three anterior ones directed inward, the others reclinate, upper pair small, slightly behind these outside of the row a second pair larger and divaricate; orbitals three pairs, proclinate; face silvery pollinose, its lower border protuberant, the ridges very flat, bare; parafacial with two stout bristles and a few black hairs on lower part with only pale hairs above; antennae red, third segment strongly convex in front, slightly shorter than second segment; arista dark brown, thickened on proximal two-thirds, penultimate segment elongate; cheek yellow in ground color, silvery pollinose about one-third the eye height; palpi absent; proboscis moderately long, apical segment tapering from base to tip; labella small; beard grayish white.

Thorax black, dusted with gray pollen; mesonotum marked with four black stripes; pleura clothed with black hairs; scutellum red on apex, gray pollinose. Chaetotaxy: Acrostichal, 3, 3; dorsocentral, 3, 3; humeral, 6; posthumeral, 2; presutural, 2; notopleural, 2; intralar, 3; supraalar, 3; postalar, 2; pteropleural, 2; sternopleural, 2, 1; scutellum with 3 lateral (median one small), 1 decussate suberect apical, besides two pairs of weak reclinate bristles on disk behind the middle; postscutellum gray pollinose, membranous above; calypters white.

Abdomen black, subshining, with thin gray pollen, which is changeable in different views, anal segment except on sides near base red; first segment without median marginal bristles; second with one rather short stout pair; third with one pair and three at the side; fourth bearing a row of about eight discals besides a row of weaker submarginals with still smaller bristles along the margin; intermediate segments without discals.

Legs yellow (hind pair missing), tarsi black; mid tibia with two stout bristles on outer front side near middle; three intermediate fore tarsal segments broad and flattened, the apical segment less than one-half as large as preceding one; claws and pulvilli short.

Wings gray-hyaline; fourth vein with an almost rectangular bend, beyond slightly concave, thence straight to costa narrowing the first posterior cell which is open far before the wing tip; hind cross vein oblique to fourth which it joins a little nearer bend than small cross vein; last section of fifth vein more than half the length of preceding

section; third vein with bristly hairs extending about halfway to small cross vein; epaulets red; costal spine not developed.

Length, 7.5 mm.

Male.—Unknown.

Type.—Female, U.S.N.M. no. 50561.

Remarks.—Described from one female specimen in the United States National Museum labeled Havana, Cuba (Baker), collection J. M. Aldrich.

(10) CUPHOCERA CONTIGUA, new species

Male.—Front at vertex 0.386 of the head width (average of five, 0.38; 0.39; 0.4; 0.38; 0.38), widening rapidly below; parafrontals yellow on upper part becoming blackish downward, with rather dense gray pollen which extends to the vertex; median stripe yellow, narrower than one parafrontal on entire length; verticals two pairs, large; ocellars absent; frontal bristles descending about to apex of second antennal segment, lowermost bristle close to eye, the upper two slightly longer, divergent and reclinate; a secondary row of four or five frontal bristles outside the main row on widest part of front; face and cheeks yellow, covered with thick grayish-white pollen; antennae red, third segment infuscated, rather evenly convex from base to tip on front edge and only slightly longer than second segment; arista black, moderately thick, tapering to tip, penultimate segment elongate; parafacial black-haired with two large bristles near eye on lower part; face protuberant on the lower border, its ridges flat and practically bare; apical segment of proboscis tapering outward, shining brownish black, labella small; palpi absent; cheek clothed with black hairs, about four-fifths the eye height; back of head gray pollinose, thickly clothed with pale hairs.

Thorax gray pollinose, with four dark dorsal stripes which are poorly defined behind suture; pleural hairs black; scutellum red beyond base, dusted with gray pollen. Chaetotaxy: Acrostichal, 3, 3; dorsocentral, 3, 3; intraalar, 3; supraalar, 3; postalar, 2; humeral, 6; posthumeral, 3 (anterior one small); notopleural, 2; presutural, 2; pteropleural, 2; sternopleural, 2, 1; scutellum with 4 marginal (one nearest base small), a decussate apical pair, and several weak bristles scattered on disk; postscutellum black, gray pollinose; calypters opaque, white.

Abdomen subshining, reddish with a broad dark median stripe on the intermediate segments which expands on the narrow hind margin of the third and includes most of the first, the extreme apex of the fourth also sometimes blackish; dusted with thin gray pollen, which is changeable in different angles of view; first segment without median marginals; second with a pair and one at the side; third bearing a marginal row of 10 or 12; fourth with a discal row

and numerous bristles before apex on upper surface; inner forceps bowed forward near base, short and united, triangular, posterior surface near base convex, minutely punctate; outer forceps tapering rather evenly to an acute apex, shining brownish-black; fifth sternite with a narrow deep incision, the lobes clothed with fine black hairs.

Legs black, tibiae obscurely reddish; middle tibia with three or four bristles of unequal size on outer front side. Claws and pulvilli elongate, the front ones obviously longer than apical tarsal segment.

Wings gray-hyaline, small cross vein slightly infuscated; fourth vein with a rectangular stumpless bend, curved inward for a short distance beyond the angle thence straight in a diagonal direction to the costa; first posterior cell narrowly open far before the wing tip; last section of fifth vein about one-fourth the length of preceding section; third vein setulose to the small cross vein; costal spine not developed; epaulets reddish.

Female.—Hardly distinguishable from *hirsuta*, but the sides of the front are usually darker and more densely pollinose. Front at the vertex, 0.4 of the head width (average of five, 0.4, 0.41, 0.4, 0.41, 0.38); the usual two proclinate orbitals present with one or two reclinate bristles between these and the main frontal row; abdomen usually darker on the sides than in male, anal segment entirely red; pulvilli short, otherwise similar to male.

Length, 8 to 13 mm.

Holotype.—Male, from Giant Forest, Calif., in Kansas University Museum.

Remarks.—Described from 22 males and 13 females. In the Kansas University collection 8 males and 1 female, Giant Forest, Calif., July 28, 1929 (R. H. Beamer and Paul W. Oman); 1 male, Big Bear Lake, Calif., July 26, 1932 (R. H. Beamer); 1 male and 1 female, Jacinto Mountains, Calif., July 21, 1929 (R. H. Beamer); 1 male and 2 females, Huachuca Mountains, Ariz., July 8, 1932 (R. H. Beamer); 2 males and 5 females, Oak Creek Canyon, Ariz., 6,000 feet, July and August (F. H. Snow); 2 males and 2 females, Magdalena Mountains, N. Mex., August 1894 (Snow); 3 males, without locality, labeled "Col. Snow" and one "Bailey Col., Aug. '90"; 1 female, Oliver, British Columbia, August 6, 1931 (L. D. Anderson). In National Museum 1 male, Bead Lake, Newport, Wash. (M. C. Lane). In J. Wilcox's collection 2 males, Antelope Mountain, Grant County, Oreg., August 13, 1932 (D. K. Frewing), and 1 female, Mount Rainier, Wash., White River Camp (J. Wilcox). In Charles H. Martin's collection 1 male, Monrovia Canyon, Calif., September 18, 1931 (C. H. Martin).

The specimens studied vary considerably in size, but I have been unable to find any tangible characters to separate additional forms. The species has been recorded from New York by West under the

unpublished manuscript name *C. stricklandi* Curran (New York State List, p. 819). The allotype female and three paratypes (both sexes) of Curran's proposed *Trichophora stricklandi* are now in the Kansas University collection and were kindly loaned to me for study by Dr. R. H. Beamer.

(11) CUPHOCERA HIRSUTA (Townsend)

Deopalpus hirsutus TOWNSEND, Smithsonian Misc. Coll., vol. 51, pp. 110-111, 1908.

Cuphocera aurifrons REINHARD, Ent. News, vol. 35, p. 54, 1924.

Originally described from a single male specimen from Meadow Valley, 7,300 feet, Chihuahua, Mexico. The type is in the United States National Museum. Full descriptions of the species are readily accessible, to which may be added the following additional items: Front in male 0.362, in female 0.384, of the head width (average of five specimens measured for each sex). Male genitalia reddish, with the usual broad lateral lobe; inner forceps united, ordinary in length with the sides tapering rather sharply to the apical third, apex narrow and rounded, hind surface on basal half usually flat or slightly convex sometimes with a narrow shallow median groove; outer forceps rather stout, tapering shortly before apex, inner surface concave on apical third, in profile bowed backward with a rather square shoulder near base behind; fifth sternite deeply divided, the lobes reddish bearing a few black hairs along the margin of the incision.

The conspicuous pale or yellow ground color of the front readily distinguishes the species from *fucata*, with which it apparently has been confused. In Texas *hirsuta* is the commonest member of the genus. It has been collected at College Station from April to November. Additional locality records include Colorado, Kansas, Ohio, and Illinois.

(12) CUPHOCERA ANDINA (Townsend)

Epicuphocera andina TOWNSEND, Rev. Mus. Paulista, vol. 15, p. 240, 1926.

Male.—Front broad, at vertex 0.423 of the head width (one specimen), yellow in ground color, the sides subshining, thinly pollinose, and clothed with black hairs; frontal stripe pale yellow, not very sharply defined; ocellar bristles absent; inner verticals large and decussate, the outer ones of nearly equal size, divaricate; frontal bristles about eight in the row, the upper one largest, suberect, the lower one at middle of parafacial near level with apex of second antennal segment; a second row of about four large frontal bristles outside the lower part of the main row; parafacial black haired with one stout bristle on lower part, yellow in ground color covered with whitish pollen; antennae red, third segment mostly black, weakly convex in front with the apex broadly rounded, about equal the

length of second segment; arista brown, thickened as usual and tapering toward tip, penultimate segment long; face yellow, silvery pollinose, the lower border prominent and its ridges flat and bare; cheeks silvery pollinose on yellow ground color, bearing three or four moderately large bristles at middle, about three-fourths the eye height; proboscis rather long and slender, apical segment tapering toward tip, with a small labella; palpi absent; beard white.

Thorax black, gray pollinose, with four narrow black dorsal stripes, the outer ones interrupted at suture; pleura clothed with black hairs; scutellum dusted with gray pollen, apex red. Chaetotaxy: Acrostichal, 3, 3; dorsocentral, 3, 3; humeral, 5; posthumeral, 2; notopleural, 2; presutural, 2; intraalar, 3; supraalar, 3; postalar, 3; petropleural, 2 (large); sternopleural, 2, 1; scutellum with 3 lateral, 1 small decussate suberect apical, and a discal pair situated behind the middle; postscutellum normal, gray pollinose; calypters opaque, white.

Abdomen black, subshining, with thin changeable gray pollen on three basal segments, sides of the intermediate ones tinged with red; anal segment wholly red, covered with dense whitish pollen to tip; first segment without median marginal bristles; second with one stout pair; third with a still larger pair and four at the side; fourth with a strongly arcuate row of about 10 discals, behind these a submarginal and a marginal row of smaller bristles; no discals on intermediate segments; genitalia reddish with a large paler lateral lobe; inner forceps united on entire length and bowed forward, convex at base behind, the surface punctate clothed with fine hairs, tapering beyond middle to a narrow blunt apex; outer forceps bowed backward near base and directed inward when viewed from the rear, shining black on apical half; fifth sternite with a broad U-shaped incision. the lobes reddish, lightly sprinkled with pollen and sparsely black haired.

Legs black, tibiae reddish; front claws and pulvilli shorter than apical tarsal segment; mid tibia with two stout bristles on outer front side near base; hind tibia with a row of about five wide-spaced uneven bristles on outer posterior side.

Wings gray-hyaline; third vein with bristly hairs extending almost to small cross vein; last section of fifth vein distinctly less than half the length of preceding section; fourth vein with a rounded rectangular stumpless bend; the apical cross vein undulates slightly and gradually narrows the first posterior cell which is open far before the tip of wing; costal spine vestigial; epaulets red.

Female.—Front at vertex 0.434 of the head width in the one specimen; orbital bristles two or three proclinate and one divergent reclinate pair situated slightly before the uppermost frontal outside

the row; third antennal segment about one and one-half times as long as wide; otherwise very similar to male.

Length, 9 mm.

Remarks.—Redescribed from one male and one female in the United States National Museum, from Verrugas Canyon, Peru, 5,500 feet, July 2, 1913 (C. H. T. Townsend). The type locality is Mantucana, Peru; type, female, in the Experiment Station collection, Lima, Peru.

The species resembles *hirsuta* but is readily distinguished by the strong bristles on the middle of the cheek, wider front, and three marginal scutellar bristles. There are other minor differences.

(13) CUPHOCERA FUCATA (Van der Wulp)

Trichophora fucata VAN DER WULP, Tijdschr. Ent., vol. 35, p. 193, 1892; *Biologia Centrali-Americana*, Diptera, vol. 2, p. 476, 1903.

Cuphocera fucata COQUILLETT, Revision of the Tachinidae of America, p. 140, 1897.—ALDRICH, Catalogue of North American Diptera, p. 483, 1905.

Male.—Front at vertex 0.3 of the head width (one specimen), widening rapidly to base of antennae; parafrontals largely shining black, gray pollinose below and at outer corners of vertex; median stripe yellow narrowed toward triangle, where it is less than half the parafrontal width; ocellar bristles absent; verticals two large pairs; orbitals absent; frontal bristles on widest part of parafrontal arranged in two rows, which diverge strongly beneath base of antennae, descending below middle of second segment, uppermost three bristles in the main row reclinate, the remainder directly inward; face noticeably bulged at middle, silvery pollinose, in profile concave above the mouth which is strongly protuberant; facial ridges flat and bare; parafacial with two stout bristles on lower part and black hairs extending upward to lowermost frontals; cheek silvery pollinose, sparsely clothed with black hairs, about three-fourths the eye height; antennae reddish yellow, third segment infuscated, strongly convex on anterior edge and slightly exceeding length of second segment; arista blackish, penultimate segment about one-fifth the length of third which is pubescent; palpi absent; proboscis moderately slender, apical segment tapering from base to tip, labella small; back of head convex in profile, thickly clothed with pale or grayish-white hairs.

Thorax black, gray pollinose, marked with four dorsal subshining black stripes; scutellum black, dusted with changeable gray pollen. Chaetotaxy: Humeral, 6; posthumeral, 2; notopleural, 2; presutural, 2; dorsocentral, 3, 4; acrostichal, 3, 23; intraalar, 3; supraalar, 3; postalar, 3; pteropleural, 2; sternopleural, 3; scutellum with 3 laterals besides one smaller decussate apical and a discal pair; post-

scutellum normally developed, gray pollinose; calypters semitransparent, white.

Abdomen black, the sides and apex tinged with red, with changeable gray pollen on all segments, apical third to half of last two shining in most views; first segment without median marginals; second bearing a rather short stout pair; third with a marginal row of 8; fourth with several rows of discals besides the usual marginal row, intermediate segments without discals; genitalia ordinary in size; inner forceps short, united, thickened at base, tapering sharply to an acute tip, yellow; fifth sternite blackish, deeply divided, the lobes clothed with short, fine hairs.

Legs black, tibiae at middle and the knees yellowish; mid tibia with two large and two smaller bristles on outer front side; hind tibia with four or five bristles of varying size on the outer hind edge; claws and pulvilli normally elongate.

Wings faintly tinged with yellow along the costal margin; veins bare except third which is setulose almost to small cross vein; fourth vein with a rectangular bend which bears a short appendage, beyond the bend concave to costa, which it reaches about one-half the length of the hind cross vein before the wing tip; costal spine not developed; epaulets red.

Length, 8 mm.

Remarks.—Redescribed from one male (cotype) specimen in the United States National Museum from Atoyac, Vera Cruz, April (H. H. Smith).

There are a number of references to the species, as "*C. furcata*", from the United States; these are all subject to verification. The shining black parafrontals readily separate it from *hirsuta*, with which it seemingly has been confused. I have not seen any specimens of the female.

(14) CUPHOCERA BEAMERI, new species

Distinguished from all other known species of this group in having four sternopleural bristles. In other details the species is very similar to *contigua*, from which it differs most essentially in having the inner genital forceps laterally compressed at the base, rather slender and uniformly tapering to a narrow apex, behind straight in profile view with a slight median keel extending from base to tip; outer forceps as usual. Front (before vertex) 0.381 of the head width (one specimen), widening rapidly downward; cheek about four-fifths the eye height, bearing rather coarse black hairs; back of head thickly clothed with pale-yellowish hairs; front pulvilli greatly enlarged, about one and one-half times the length of apical tarsal segment.

Length, 12 mm.

Female.—Unknown.

Holotype.—Male, in the Kansas University Museum.

Remarks.—One specimen collected in San Diego County, Calif., July 4, 1929, by R. H. Beamer.

(15) CUPHOCERA TOROSA, new species

Male.—Front at vertex 0.387 and 0.373 of the head width in the two specimens; parafrontals blackish, gray pollinose to vertex; median stripe yellow, triangular, at middle narrower than one parafrontal; ocellar bristles absent or hairlike; verticals two pairs, large; frontal bristles in a double row below the middle, the lowermost bristles near the eye almost on level with apex of second antennal segment, two or three uppermost bristles suberect or reclinate the remainder directed inward and upward; antennae red, third segment mostly black, strongly convex in front, slightly longer than the second segment; arista black, tapering evenly to tip, penultimate segment long; face silvery pollinose, its lower border strongly protuberant, the ridges flat bearing one or two bristles above the vibrissae; parafacials broad, with two macrochaetae on lower part and clothed with numerous slender black hairs except along the inner margin; cheek with rather dense cinereous pollen, black haired, about three-fourths the eye height; proboscis equal the height of head, the distal segment shining brown, tapering apically from base, labella small; palpi absent; beard grayish white.

Thorax black, gray pollinose, with four indistinct black dorsal vittae; pleura black haired; scutellum except at base red, thinly sprinkled with gray pollen. Chaetotaxy: Acrostichal, 3, 3; dorso-central, 3, 3; postalar, 3 or 4; intraalar, 3; supraalar, 3; presutural, 2; humeral, 6; posthumeral, 3 (anterior one small); notopleural, 2; pteropleural, 2 (large); sternopleural, 2, 1; scutellum bearing 4 marginals of unequal size, a strong suberect apical pair, decussate at tip, disk with 10 or 12 erect moderately large bristles besides a stouter reclinate pair shortly before the apex; postscutellum black, gray pollinose; calypters opaque, white.

Abdomen black, the sides and fourth segment above obscurely reddish, with gray pollen which extends thinly over the upper surface somewhat denser on bases of last three segments; first segment without median marginal bristles; second with a large pair; third bearing a marginal row of about 10, large; fourth with a discal row and numerous erect bristles on apical half; intermediate segments without discals; genitalia ordinary in size, with a large reddish lateral lobe; the united inner forceps blackish, convex near base behind the surface punctate and clothed with black hairs, in profile view strongly bowed forward beyond middle, the apex tapering to a narrow rounded tip, smooth and shiny; outer forceps red at base shining black beyond, tapering to an acute tip, strongly bowed with

the convex side in front; fifth sternite black, deeply divided, the lobes with a few black hairs.

Legs black, tibiae obscurely reddish at middle; claws and pulvilli elongated; middle tibia with two or three large bristles on outer front side; hind tibia with a row of about six uneven bristles on outer posterior edge.

Wings grayish hyaline; third vein setulose two-thirds the distance to small cross vein; fourth vein with an almost rectangular bend curving inward beyond thence straight in a diagonal direction to costa; first posterior cell open far before the wing tip; epaulets black; costal spine not developed.

Length, 12 to 13.5 mm.

Female.—Unknown.

Type.—Male, U.S.N.M. no. 50562, from Gold Beach, Oreg.

Remarks.—Described from one male in the United States National Museum collected at Gold Beach, Oreg., July 12, 1924, by H. A. Scullen, and one male in the Kansas University Museum collection taken by R. H. Beamer, San Jacinto Mountains, Calif., July 21, 1929.

(16) CUPHOCERA INCONGRUA, new species

Readily recognized in the male sex by the presence of two strong proclinate orbital bristles; ocellars and usually the palpi absent; propleura bare; intermediate abdominal segments without discals.

Male.—Front broad, at vertex 0.383 of the head width (average of three, 0.38; 0.37; 0.4), yellow in ground color, the sides thinly gray pollinose and clothed with black fine hairs; frontal stripe pale yellow, narrower than one parafrontal on entire length; verticals two pairs, large; frontals about eight in the row which is suddenly divergent beneath the antennae extending about to level with middle of the second segment; two or three extra frontal bristles situated between the orbitals and the main row; face and cheeks yellow in ground color covered with silvery subshining pollen; antennae red, third segment mostly dark, about as broad as long and distinctly shorter than second segment; arista dark brown, evenly tapering, penultimate segment about twice the length of first; parafacial broad, with two stout bristles near eye on lower part and clothed with scattered black hairs except on inner margin; facial ridges flat, bearing one or two bristles above vibrissae; face moderately bulged at middle, its lower border strongly protuberant; cheeks rather sparsely clothed with coarse black hairs, about three-fourths the eye height; proboscis about equal the height of head, distal segment narrowed toward tip, shining reddish brown, labella compressed not thicker than proboscis; minute palpi present in one

and absent in the other two specimens; back of head thickly clothed with long pale grayish hairs.

Thorax black, gray pollinose, with four dark dorsal vittae which are distinct before the suture and somewhat less defined behind; hairs on pleura black; scutellum wholly red, thinly dusted with gray pollen. Chaetotaxy: Acrostichal, 3, 3; dorsocentral, 3, 4; intraalar, 3; supraalar, 3; postalar, 2; humeral, 5 or 6; posthumeral, 3 (anterior one sometimes small); notopleural, 2; presutural, 2; pteropleural, 2 (large); sternopleural, 2, 1; scutellum with three marginal, a smaller suberect decussate apical and a reclinate discal pair situated well behind the middle; disk bearing about 10 erect bristles besides numerous smaller hairs; postscutellum black, pale membranous on upper part; calypters white.

Abdomen red with a broad black dorsal stripe widening on the second segment and including most of the first; gray changeable pollen on most of the upper surface; first segment without median marginal bristles; second with one pair; third bearing a marginal row of about ten; fourth with numerous bristles above on apical half; genitalia reddish black with a large lobe on each side; inner forceps united and wider than usual, broadly sulcate on the apical third behind, apex broadly rounded or blunt; inner forceps short, very slender, terminating in an acute minute hook; penis bowed forward at middle, the apex prolonged behind and bordered with a pale membrane; fifth sternite with a broad V-shaped incision, the lobes reddish, bearing black hairs along the darker inner margins and finer brown hairs near the middle.

Legs black, tibiae reddish; pulvilli tawny, the front ones distinctly longer and about equal the last tarsal segment; mid tibia with two or three stout bristles on outer front side; hind tibia with about six wide-spaced uneven bristles on the outer posterior edge, and two moderately large ones near middle on the inner side.

Wings grayish hyaline, small cross vein slightly infuscated; fourth vein with a stumpless rectangular bend, shortly beyond which it curves outward, thence almost straight in an oblique direction to costa; first posterior cell narrowly open far before wing tip; third vein with only four or five hairs near base; last section of fifth vein about two-fifths the length of preceding section; epaulets reddish; costal spine small.

Length, 10 to 11 mm.

Female.—Unknown.

Paratype.—Male, U.S.N.M. no. 50563.

Remarks.—Described from two males in my collection taken at Balmorhea, Tex., August 4, 1922, by C. S. Rude, and one male (holotype) in the Kansas University collection from Mescal, Ariz., July 28, 1927 (R. H. Beamer).

In the structure of the genitalia the species is distinct from all other members of the genus and shows a rather close relationship to *Peleteria*. It is included here mainly on the absence of any palpi.

SPECIES PREVIOUSLY PLACED IN CUPHOCERA, BUT NOT HEREIN IDENTIFIED
OR REFERRED TO OTHER GENERA

aurca ALDRICH, Proc. U.S. Nat. Mus., vol. 69, art. 22, p. 25, 1926 (*Cuphocera*).

Belongs to the genus *Chilocephalus*.

californiensis MACQUART, Diptères exotiques nouveaux ou peu connus, suppl. 4, pt. 2, p. 148, 1851 (*Micropalpus*).—COQUILLET, Revision of the Tachinidae of America, p. 140, 1897 (*Cuphocera*). I have not identified this species. The type is in J. E. Collin's collection, Newmarket, England.

erythrostroma BIGOT, Annales, no. 41, p. 95, 1888 (*Epalpus*).—BRAUER, Sitz. Akad. Wiss. Wien, Math.-nat. Classe, vol. 107, p. 504, 1898 (*Cuphocera*). This species has not been determined in the material examined.

nitidifrons VAN DER WULP, Biologia Centrali-Americana, vol. 2, p. 37 (1888) and p. 477 (1903) (*Trichophora*).—SCHINER, Reise der österreichischen Fregatte *Novara*, Zool. Theil, Diptera, p. 330, 1868, as *Cuphocera macrocera* (Wiedemann), which (in part) equals *Copecrypta nitidifrons* (Van der Wulp) (Aldrich, Proc. U.S. Nat. Mus., vol. 74, art. 19, p. 24, 1929).

ruficauda VAN DER WULP, Tijdschr. Ent., vol. 10, p. 146, 1867 (*Schineria*).—COQUILLET, Revision of the Tachinidae of America, p. 139, 1897 (*Trichophora*).—WILLISTON, Trans. Amer. Ent. Soc., vol. 13, p. 305, 1886 (*Cuphocera*), equals *Copecrypta nitens* (Wiedemann) (Aldrich, Proc. U.S. Nat. Mus., vol. 74, art. 19, p. 27, 1929).