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LEE ABRAM STRONG

Be it resolved, That the Entomological Society of Washington at its regular meeting on June 5, 1941, express its deep grief at the passing of Dr. Lee Abram Strong, distinguished leader of American entomologists, and its sense of loss at this departure of one of its well loved members. The society knew Dr. Strong both as a friend and as a chief, and felt for him admiration, respect, and affection.

Be it further resolved, That this resolution as well as a biographical sketch of Dr. Strong's services to the entomological work of the United States be published in the Proceedings of the Society and that the secretary be instructed to express to Mrs. Strong and to other members of the bereaved family, our sincere and heartfelt sympathy.

NOTES ON NEARCTIC PANGONIINAE (DIPTERA, TABANIDAE).[1]

By Cornelius B. Philip,

Medical Entomologist, United States Public Health Service.

The recent appearance of the excellent monographs by Brennan (1935) and Stone (1938) on the 2 major subfamilies of Nearctic Tabanidae (deerflies and horseflies) has emphasized the desirability of revising the catalog list of North American species which has been very much augmented since the useful but badly outdated one by Aldrich (1905). The present discussion is intended to partially clear the way for such a catalog by certain additions and emendations to Brennan's treatment of the Pangoniinae.

Types of new species herein described, unless otherwise stated, are in the collection of the author.

STONEMYIA Brennan, 1935.

The wealth of species and variations discussed and figured by Ferguson (1926) for *Scaptia* Walker, 1850, make the writer

[1] Contribution from the Rocky Mountain Laboratory (Hamilton, Montana) of the Division of Infectious Diseases of the National Institute of Health.

suspect that at least the hairy-eyed *S. californica* (Bigot) (Syn. *Silvius jonesi* Cresson), for which Brennan erected the subgenus *Pilimas*, will be difficult to maintain as generically distinct from *Scaptia*, but lack of Australian and certain Neotropical material prevents a more definite opinion at present. Moreover, minute scattering hairs can be seen on the eyes of even the "bare-eyed" species, as also noticed by Aitken. Study of the allotype by the writer and further comparison of the types by Cresson and by Pechuman, have shown the above synonymy of *S. jonesi*. Stone has pointed out that such synonymy does not make a genus monotypic. At the end of this paper the original author has validated *Pilimas* by genotype designation.

Corizoneura ruficornis Bigot, 1892.

This species included by Brennan in *Stonemyia* was misidentified by Hine and others, as specimens kindly compared by Mr. H. Oldroyd with the types (2 males) in the British Museum are not in agreement. Since describing *abaureus* below, the true *ruficornis* was rediscovered by Dr. T. H. G. Aitken, a dichromatic species whose females are extremely difficult to separate from those of the former. The entire thorax is dark in the males, the first tergite and terminal tergites and sternites predominantly so, but the spots on the second to fourth segments described by Bigot are variable. In general, the females are smaller (11–13 mm.) and the scapes of both sexes longer than thick (in *abaureus* these two measurements are equal). Numbers of both sexes were taken by Aitken and colleagues while beating shrubbery at night; its occurrence is reported in the foothills (1500–2500 feet) of the western slope of the Sierra Mountains.

Regarding the types Oldroyd further states, ". . . no specimen so labelled (*ruficornis*) in the collection, but I have 2 ♂ ♂ labelled as types of '*C. ruficosta*' by Bigot, which fit the description, and have the right data. Evidently Bigot changed the name before publication."

Stonemyia abaureus, n. sp.

Size variable, males 10.5–13 mm., females 13–16 mm. Body and appendages golden yellow, eyes contrasting black, ostensibly bare; wings practically hyaline, the costal margin yellow, veins often faintly margined, vein R_4 with a short to moderate spur basally, the anal cell closed and appendiculate at the margin.

Holotype ♂, 14 mm. Eye facets about uniform; unicolorous green (relaxed). Vertical triangle raised, pale yellow with short concolorous forward-curved hairs posteriorly, the 3 ocelli distinct, brown. Antennae and palpi yellow, the latter produced to three-fourths the length of the stylets, and with predominantly black, shaggy hair from the distal half of the first joints to the end of the second. Hair of face and cheeks yellow. Labium yellowish, retracted, but

stylets little more than half the height of the head. Integument of entire body and legs concolorous, yellowish, covered with yellowish hair except blackish over most of the hind femora and basally on the abdominal tergites, narrowing gradually mesally to about half the width of the segments, the tarsi brownish distally.

Patrick Creek, California, July 19, 1934, G. P. Englehardt. In the collection of the author through courtesy of Dr. L. L. Pechuman. Compared with types of *C. ruficornis* Bigot by H. Oldroyd, and labelled not in agreement, 1939.

Allotype ♀, 14.5 mm. Agrees closely with the male except for sexual differences and shorter vestiture. Front pale yellow, not quite 4 times higher than basal width, slightly widened below; ocellar tubercle very pronounced, concolorous with front; subcallus not widened to the eye margins. Length of palpi as in male, but entirely yellow hirsute; proboscis about two-thirds the height of the head, yellow, darkening on the labellae. Black hairs not evident on the hind femora and shorter, less prominent on the abdomen than the holotype, but with much the same basal distribution.

Shasta County, California, July 24, 1907.

Paratypes.—All from Calif.: ♂, San Felipe Creek, June 23, 1935, C. M. Dammers; 2 ♀ ♀, Kaweah P. O., August 8, 1938, R. H. Beamer; ♀, Santa Rosa, August 16, 1938, Jean Russell; 2 ♂ ♂, ♀ Cuyamuca Lake, July 6, 1929, R. H. Beamer and Paul W. Oman; ♂, Los Angeles Co., May, Coquillett; ♀, Lucerne, July 17, 1935, R. H. Beamer; 4♂ ♂, Pinon Flat, San Jacinto Mts., May 28 and 30, 1940, Michener, Gerhardt, and Daniels; ♂, Mineral King, July 31, 1935, Bohart; ♂, Sunset Valley, Santa Barbara Co., June, 1939, White; ♂, Vauville, June 6, 1932, Harris; ♀, San Jacinto Mts., Kern Co., June 5, 1939, Gerhardt. In the collections of the British Museum, Kansas University, Rocky Mountain Laboratory, Drs. L. L. Pechuman and T. H. G. Aitken, and the author.

Male and female, Los Angeles, Calif., no date, Coquillett, in the U. S. Natl. Museum, under "*abaureus*."

The number and distribution of black hairs on the abdomens, femora and palpi of the paratypes are subject to variation while occasional males show some darkening of a few ventral sclerites of chest and abdomen. See also Brennan (1935), who adds Wyoming (Yellowstone) to his California records of "*ruficornis*." I have never seen it from outside the latter State. Aitken collected 2 males on blossoms of *Eriogonum fasciculatum*.

S. pigra (O. S.) 1875.

Add North Carolina and Pennsylvania. May be the same as *Silvius isabellinus* Wied., 1828, but the missing type will need to be consulted for definite opinion; the Ohio specimen listed by Walker is *S. rasa* (Lw.).

Pangonia macroglossa Westwood, 1835.

This has been attributed to "Ga." but may now be definitely removed from North American lists as recheck of the type in the Hope Collection, Oxford Museum, by Dr. B. M. Hobby and H. Oldroyd proves it to be *P. gulosa* Wied. from South Africa, to a locality in which one of the original labels, "Geo," refers.

ESENBECKIA Rondani, 1864.

E. delta (Hine) 1920. A specimen taken by the writer at El Paso, adds Texas to the distribution.

E. incisuralis (Say) 1823. Kröber (1934) placed this (*incisa* Wied. 1828) as *Ricardoa*. Through courtesy of Dr. K. Delkeskamp of the Berlin Museum, the writer was loaned the type of *Ricardoa latifiagrum* End., and considers it a light form of *incisuralis* which varies as indicated by Brennan (1935). Add Arizona.

Since *Pangonia* (*Fidena*) *incisuralis* Macquart, 1847, a valid Neotropical species according to Kröber, is preoccupied by Say's name, and the name *macquarti* has already been used by Guerin for an allied species, *Fidena abominata* n. n. is here proposed.

GONIOPS Aldrich, 1892.

G. chrysocoma Osten Sacken. The inclusion of "Dakota" by Ricardo (1900) in the distribution of this species is an obvious error in referring to Aldrich's location when his *hippoboscoides* (= *chrysocoma*) was described.

CHRYSOPS Meigen, 1803.

C. beameri Brennan. Add Ill., N. J., N. Car. and Ga. A number of eastern records of *sequax* are actually this species, such as those of Daecke (1907) and Brimley (1938). I have 3 males from Massachusetts which differ in certain essentials from *sequax* as discussed by Brennan (1935) and are without doubt the undescribed males of *beameri*, the wing pictures and 4 abdominal black stripes readily associating them with the recently described female.

Allotype ♂, 7.5 mm. In addition to the abbreviated, lateral, pollinose stripes on the face, there is a short subantennal tooth of pale pollen. Palpi brownish. Middorsal thoracic stripes and scutellum plumbeus instead of yellow. Lateral abdominal stripes fading in the middle of each tergite, but evident even on the first, the median pair complete as in the female. The hyaline triangle narrow, just reaching vein R_{2+3}, the apical spot broadly invading cell M_1; the posterior subhyaline areas only a little darker than in the female, most evident margining

the entire length of the cubital vein, but the heavy anterior infuscation abruptly limited by veins M and Cu_1, as in the female, cell Cu_1 not clouded posteriorly as reported for *sequax*, and cell 2nd M with only restricted, indefinite tinges basally.

"Woods Holl" (sic), Mass., Aug 9, 1899. Two other specimens in same series, essentially agree, the lateral abdominal stripes more pronounced, and complete in one.

C. bishoppi Brennan.

The male of *C. atricornis* described by Bigot (1892) is this according to a specimen compared by H. Oldroyd. Add Oregon.

C. callidus Osten Sacken, 1875.

Unfortunately this well-known name is preoccupied according to the International Rules, Article 35, paragraph "d," by *C. calidus* Walk. 1848, and the name *callidula* is here proposed, preserving the name by addition of the diminutive in as nearly the original form as possible.

C. celer Osten Sacken.

The feminine, to agree with other specific names changed in gender, is *celeris*.

C. ceras Townsend.

This species was wrongly synonymized with *C. megaceras* Bellardi by Hine (1925) and omitted by Brennan (1935). The writer has transferred it in a new genus, *Assipala*, in another paper for reasons given therein (Philip, 1941).

C. coloradensis Bigot.

The male of *C. pachycera* Will., 1887, ascribed by Adams (1903) and Brennan (1935) to *C. proclivis* O. S. but doubted by Philip (1935), proves to be that of *C. coloradensis*. The amount and intensity of melanization, particularly of the legs and palpi varies considerably in the 7 specimens studied, 4 of them being considerably darker than Williston's specimen as redescribed by Brennan under *C. proclivis*. Two of the latter were taken with considerable series of females near Davis, California, by Spurlock.

C. dimmocki Hine.

The describer states, "type taken . . . eight other specimens . . ."; the five "cotypes" seen by Brennan (1935) are therefore incorrect.

C. flavida Wiedemann.

The variability of this species is confusing, and includes a northern form which approaches *brunnea* Hine, especially in wing pattern, doubtless leading to some errors in distributional records of the two (see also Daecke, 1907). I have difficulty in accepting *reicherti* Fairchild, 1937, as more than a subspecies of *flavida* due to variation in the diagnostic characters of a long series of the latter studied.

C. inda Osten Sacken.

C. pilumna Kröb. is a male of this according to a specimen compared for the writer by Mr. G. S. Walley in Ottawa, and later verified by the author.

C. hyalina Shannon.

Since this is the only clear winged species of the genus in this country, Surcouf's (1921) reference to a doubtful Ohio *Nemorius* is not clear. The latter, like *Zeuximyia*, would appear to be intermediate between *Chrysops* and *Silvius*, and it is doubtful if *hyalina* is congeneric in the restricted sense with the European *vitripennis*.

C. lugens Wiedemann.

Type male in Copenhagen Museum, not Vienna.

C. noctifera Osten Sacken.

Study of a considerable series of this and *pertinax* Will. from collections of various western institutions, including 2 males from Lake and Klamath Counties, Oregon, has convinced me that the latter species represents a melanistic, more widespread, northern subspecies of *noctifera*. In most *noctifera* the lateral red on the abdomen is pronounced, but occasional specimens show marked reduction, and 2 females from Alameda and Placer Counties, Calif., are entirely dark with whitish lateral pile as in *pertinax*. On the other hand, one each from Harney County, Ore, and Coolin, northern Idaho, have some lateral red a little more extensive than seen in a few *noctifera* from Calif. There is usually an extension of the outer margin of the cross-band in cell R_3 approaching that seen in *nigripes*, but the yellow vestiture and more distinct median abdominal triangles of the latter should prevent confusion with such variants as the Idaho specimen mentioned above, in addition to the broader attachment of the apical spot to the cross-band.

It is doubtful if the unknown male of *noctifera* will be separable from *pertinax* males. There is no red on the abdomen of either of the latter. Typical *pertinax* females were taken in the same

series with the Klamath, Oregon, male, and the Coolin, Idaho, female. Until better evidence is shown for their separation than color, and robustness in only the females mentioned by Brennan (1935), I prefer to consider *pertinax* as a subspecies of *noctifera*, although the latter predominates only in California, admitting it is strange that more than the 2 northern intermediates mentioned have not been seen in that rather common form in Montana and other northwestern States. The Ontario and New Hampshire records by Kröber (1926) seem doubtful, as also does the description of his male with "Spitzenfleck hauchfein."

C. pachycera Will.

I consider both *C. hungerfordi* Brennan, 1935, and *C. dilata* Rowe and Knowlton, 1937, to be at most subspecies of this. The former is differentiated on the basis of lateral, abdominal spots on tergite 2 in both sexes, the latter by fenestrations in the cross-band of the wings. The abdominal pattern is especially variable, but not more so than in some other species of *Chrysops* and the lateral spots may be found in all degrees of intensity to complete disappearance in the same series; *hungerfordi* represents the dark phase. Similar variations occur in the abdominal pattern of male paratypes of *dilata*, but the extent and distribution of the clear areas in the wings of both sexes are more constant in this form from southern Utah. I have seen several specimens of *hungerfordi* from western Texas, in addition to the types from southern New Mexico and Arizona. The Oregon record of *pachycera* listed by Brennan (1935) is doubtless based on Cole and Lovett's (1921) misidentification of *C. coloradensis*, the listed specimen of which I have seen.

C. pikei Whitney.

Since Bequaert (1933) mentions "only fragments of four" of the 11 cotypes remain at the Museum of Comparative Zoology, a complete, well-preserved cotype on the original long, white pin labelled "Mo." and later "Daecke Collection" "from Whitney" in the Pennsylvania State Agr. Collection at Harrisburg, is here selected as lectotype. A duplicate with one wing missing is in the collection of the author through kindness of Dr. A. B. Champlain.

C. proclivis O. S.

The Colo. record of *C. atricornis* Bigot (type ♀ only) is unusual, but the wing pattern agrees here according to comparison by Oldroyd. Since the true male of this has not previously been known (see *coloradensis*) it is here briefly described.

Length of 2 specimens, 6.5 and 8 mm. Predominantly black, with a very narrow, but complete, bare, yellow midfacial stripe, yellow pollinosity confined

to lateral facial stripes, palpi and antennae dark,the latter brownish basally on the first segment, thoracic dorsum with the usual pale stripes faint anteriorly, the grayish lateral stripes above and below the wing base more pronounced, the abdominal incisures very narrowly yellow, and notched with a faint streak of the same color half or a little more across the second tergite on each side (and the 3rd and 4th mesally in one specimen); fore and hind tibiae basally tinged, and middle legs with the whole tibiae, and apical half of the femora yellow. Apical spot pronounced and narrow along the costal margin, but indefinite and fading behind; the entire basal part of the wing infuscated (paler behind) except for a small diagonal hyaline spot at the apex of the 2nd M cell, the cross-band reaching the posterior border in cell M_3.

A specimen each seen from Cle Elum, Wash., and Yosemite Valley, California.

Whether these are more properly assigned to the subsp. *surda* O. S. will have to await the accumulation of more specimens.

C. sepulcralis Fabricius (*sepulchralis* Kirby?).

The lack of any confirmatory specimens over the years for Kirby's and Walker's early identifications of this northern Palaearctic species, impel the writer to follow Osten Sacken (1878, p. 54) and Ricardo in discarding it from the Nearctic list.

Chrysops abata, n. sp. (from Latin, inaccessible).

Holotype ♀, 8 mm. *Head* with pollinosity of front and face including a complete, narrow, mesal stripe to the oral margin, yellow; vertical, frontal and facial callosities and cheeks black, the integument on either side the mesal pollinose stripe narrowly yellowish with brownish shades. Frontal callosity but little broader than tall. Antennae slender, the flagellum black, equal in length to the 2 yellow basal segments combined. Palpi not grooved, dark, with yellowish tinges on the extreme base. Eye pattern with heavy maculations, the occipital border contiguous to, the other spots separated from the eye margins, arrowhead connected only with the median spot. *Thorax* and scutellum plumbeus, the usual 5 dark stripes distinct; pleurae predominantly yellowish. Legs smoky, the fore pair and all femora darkest; fore coxae dull yellowish on the basal half. Abdomen yellow and black. The patterns of it and the wings as figured Plate 15 (1 and 2 A, respectively). Ventor yellow, a very narrow median line on the first 2 sternites, expanding on the third, the remainder dark with yellowish tinges and incisures. A fine yellowish pubescence over the whole abdomen, both above and below, and especially noticeable posteriorly.

From "Jacksonville, Florida, June 21." No year or collector.

This fly has affinities with the variable *pudica* group but would run to *inda* O. S. in Brennan's (1935) key to female *Chrysops*. It is distinguished by its complete median, yellow pollinose stripe on the face, black frontal and facial callosities,

broad though separated apical spot, strongly bowed outer margin of the crossband, completely infuscated first and hyaline second "basal" cells of the wing, and distinctive abdominal pattern. Of the North American *Chrysops* females known to the writer, *C. abata* is unique in the possession of an uninterrupted though narrow, mid-facial pollinose stripe comparable to that seen in some males. In females of *C. discalis*, this stripe is broad and also reaches the oral margin below, but widens to meet the genal stripes above the mouth presenting a very differarrangement.

C. aestuans Wulp.

The 2 outstanding characters of this species are the uniformly narrow, outer, costal infuscation ("apical spots") of the wings, and the lateral black triangles on the second abdominal segment. Variation and intergradation with closely related *C. callidula* Philip, particularly as regards the latter character, have long troubled students of the group, and Kröber (1926) has described a variety, *confusa*, with complete absence of these lateral triangles, which Brennan (1935) prefers to relate to *callidula*. However, I have an undoubted specimen of *aestuans* from Yakima, Washington, showing such reduction of the abdominal infuscation that the 2d to 4th tergites appear predominantly yellow with simply a median row of reduced geminate spots, although the wing picture is typical.

Of greater consequence because of certain misassignment by the unintiated in a major couplet of existing keys, is a variation which occurs in 4 specimens of *aestuans* from Clark County, Kansas, sent to the writer and to Dr. R. R. Parker by the late Professor Hine. Reduction, though not complete absence of the lateral spots on the 2d tergite, is also seen in these, yet the specimens appear as no more than an extreme variation of *aestuans*. The condition is remarkably parallel to variation seen in *C. proclivis* O. S. (Philip, 1935).

Chrysops aestuans subsp. **abaestuans** nov.

Holotype ♀, 8.5 mm. Differs from characteristic *aestuans* in the breadth of the apical spot of the wing and reduction of the lateral triangles on the second abdominal tergite. The hyaline triangle crosses vein R_{2+3} broadly while the apical spot increases in width just before the termination of that vein to a little over twice that at its juncture with the crossband so that slightly over half the upper margin of vein R_4 is shaded (Plate 15, Fig. 2 B); the posterior margin of the apical spot is very indefinite. The cross-band terminates before the posterior margin in cell M_3. The body colors have the usual bleached yellow appearance of *aestuans*, but the lateral triangles on the second segment are narrow and reduced, widely separated from the median geminate spot, their bases and apices rounded, the latter not reaching the middle of the segment. Anal cell barely

closed at margin. The palpi and legs are predominantly dark, the upper, anterior edge of the former, the middle tibiae, extreme bases of fore and hind tibiae and of all the tarsi yellowish, antennae deep yellowish on the first 2 and base of the third segments.

From "Clark County, Kansas, June, 1962 ft. F. H. Snow."

Allotype ♂, 9 mm. Essentially like the female except for the usual sexual differences but darker in appearance, the antennae are black, the yellow of the abdomen is deeper, the lateral triangles in the second segment less tall and the apical spot occupies about the same width distally, but crosses into the wing tip more extensively and occupies the whole of cell R_1 (Fig. 2 D).

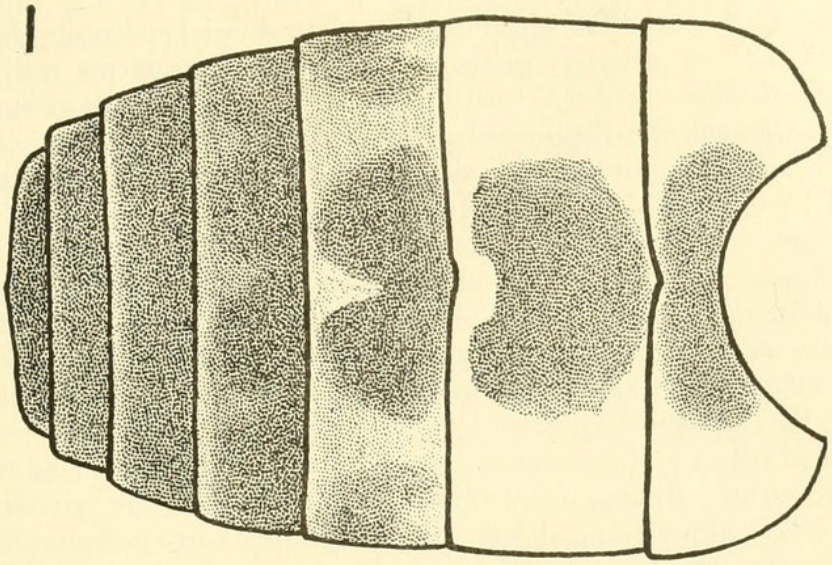
From "Ft. Collins, Colo., May 30, 1931."

Paratypes: 2 ♂ ♂, "Indian Head, Saskatchewan, 13, VII, 1926, Eric Hearle," and "6 mi. W. Logan, Utah, 7–29–35, Armstrong and Smith"; like the allotype, but darker generally, the lateral triangles larger, about normal, connected below with the median maculations; in the Saskatchewan specimen the cross-band reaches the posterior margin faintly as it usually, but not necessarily, does in *callidula*. Three ♀ ♀ all same data as the holotype; the triangles showing greater reduction than the holotype (mere dots in one); the wing patterns show slight variations from that of the holotype, anal cells more open, less or none of the hyaline triangle crossing vein R_{2+3} and either more (Plate 15, Fig. 2 C) or a little less of the apical spot crossing vein R_4 apically, and in one specimen only, the cross-band almost reaches the posterior margin in cell M_3; the legs are predominantly yellow in all but one of these females. One ♀, "Sterling Reservoir, Colo., July 10, 1921" in the collection of L. L. Pechuman also agrees.

The wide apical spot is, of course, the important feature of this variety. Omitting this character, the closeness of *aestuans* and *callidula* is again emphasized in this series of specimens in the intergrading of certain critical criteria, such as the density and width of the apical spot at its juncture with the cross-band, the close approach of the latter to the posterior margin in one of each sex, the increasing amount of yellow on the abdomen and legs, with consequent reduction of the lateral abdominal triangles.

Chrysops aberrans n. sp. (from Latin, wandering, hence variant).

This is the form heretofore placed under *striata* O. S. having yellow to brownish frontal callosities, apical spot broader including most or all of cell R_3, usually brighter thoracic and abdominal stripes, the latter seldom joined anteriorly on tergite 2, the lateral ones often obsolescent anteriorly but pronounced posteriorly.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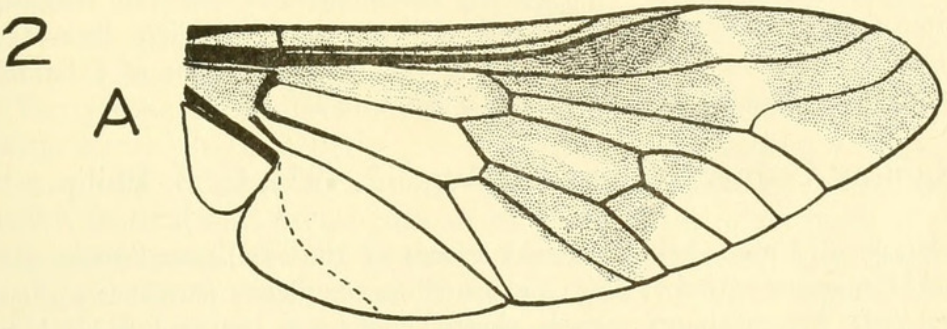
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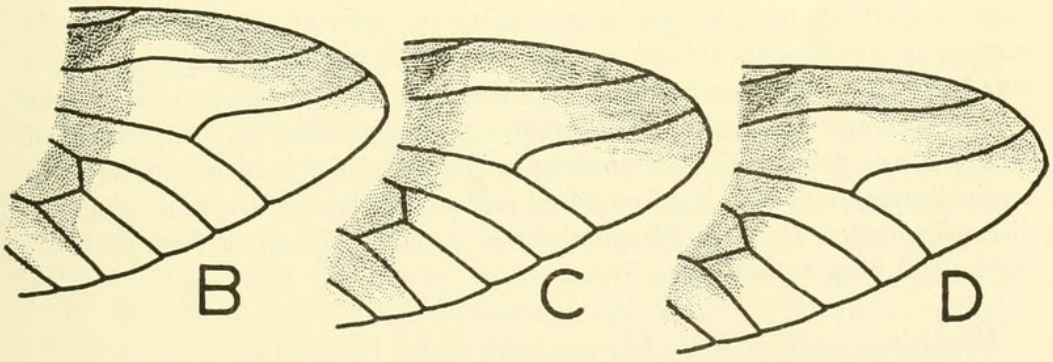
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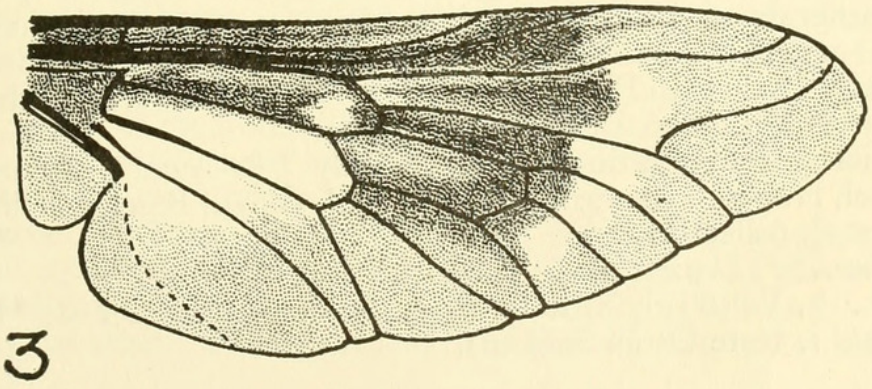
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Holotype ♀, 8 mm. *Head* with frontal and lateral facial pollinosity, frontal callosity, facial and genal integument, first 2 antennal segments and palpi yellow; narrow upper border of frontal callosity, ocellar tubercle and most of third antennal segment dark; antennae slender; palpi not grooved; no mid-facial pollinose stripe. Eye pattern with all spots isolated, the shaft complete and border divided as figured by Daecke (1906) for *striata*. *Thorax* with the usual stripes brighter than in typical *striata*, the plumbeus mid-stripe continuing as an inverted acute triangle onto the disc of the scutellum, narrowly dividing the lateral reddish margins at the apex. Lateral thoracic stripes yellowish. Wing very like *striata*, cell R completely infuscated, 2nd M and Cu hyaline, the cross-band reaching the posterior margin in M_3, but the apical spot broader almost filling cell R_3, leaving the furcation barely included in the apex of the hyaline triangle, anal cell open at the margin. Legs yellow, the middle and hind coxae, basal third of hind femora, distal third of fore tibiae, and fore tarsi brown. *Abdomen* yellow with 4 subequal dark stripes on tergites 2 to 5 inclusive, tergite 1 with indications of a geminate spot beneath the scutellum and isolated shadows at the terminations of the lateral stripes; yellow incisures widest on posterior tergites, 6 and 7 otherwise dark. Venter yellow, a broad, median, dark band abruptly terminating anteriorly on sternite 5, and indications of 2 lateral, narrow stripes reaching forward midway on sternite 2.

Ramsay County, Minnesota, Aug. 12, 1934, C. B. Philip.

Allotype ♂, 8 mm. Like the female except for the usual sexual differences. Facial integument entirely yellow, and scutellum completely plumbeus without lateral red. Wings almost entirely clouded, lighter in the anal and cubital areas, a small diagonal hyaline spot crossing the apex of cell 2nd M into the extreme base of Cu_1, the apical spot filling out cell R_3 including the furcation and invading cell R_5 faintly; anal cell barely closed at margin. Abdomen with the 4 stripes complete dorsally, the lateral ones terminating on the middle of tergite 1, and the middle pair converging but not quite joining anteriorly on tergite 2; the midventral band produced forward on all sternites, narrowing and discontinuous on 2 and 3. Maculations of eye pattern isolated from occipital border and from each other.

Washington County, Minnesota, July 11, 1911.

Paratypes: Minn., 7 ♀ ♀, same data as holotype; 8 ♂ ♂ and 127 other females, various localities, July 8 to Aug. 11 (including 3 ♂ ♂ and 2 ♀ ♀ reared by the writer) Philip, Telford, Stehr, Mickel, Knight, Pletsch, Beamer and Peters, Tinkham, Hoffman, Hill, and Denning, collectors.

Mich., 77 ♀ ♀ various localities, July 7 to Aug. 8, Brennan, Boesel, Hubbell, Byers, Gaige, Cantrall, Gloyd, Bigelow, Oliver, Steyskal, collectors.

Wisc., ♂, Dane Co., July 10, 1900.

Ill., ♀, Volo, July 8, 1932, Ross, Dozier, Mohr; 2 ♀ ♀, "Ill." (*striata* ?, teste Osten Sacken).

Ohio, 3 ♀ ♀, Sandusky, Cedar Point, Aug. 7, 8, and 14, 1902; ♂, Sandusky, Aug. 7, 1920, D. G. Hall.

Mass., ♂, Woods Holl (sic), Aug. 9, 1899.

Conn., ♀, "Williston."

Me., ♀, Lincoln County, Aug. 23, 1938, D. J. Borror; ♀, Paris, Aug. 17, 1936, C. A. Frost.

R. I., ♀, Westerly, July 23, 1936, M. Chapman.

N. Y., 2 ♂ ♂, 19 ♀ ♀, various localities, Dreisbach, Palm, Blanton, Babiy, Pechuman, Blanton and Borders, collectors.

N. J., 2 ♂ ♂, Palmyra, Aug. 7 and 12, 1925, L. B. Parker; ♂, Evesboro, Aug. 17, 1925, L. B. Parker.

Penn., ♂, no other data (*striata* ? by Osten Sacken).

In the collections of the Berlin, Vienna, British and U. S. National Museums, the Museum of Comparative Zoology, California Academy of Science, Universities of Minnesota, Michigan and Kansas, the Rocky Mountain Laboratory, Cornell University, L. L. Pechuman, T. H. G. Aitken and the author. Additional localities for the U. S. National Museum material through Dr. Alan Stone include Indiana (Bluffton), Mass. (Essex), and Que. (St. Placide).

Variations in individual characters occur within limits but compositely there is little difficulty in distinguishing this from true *striata*. Some specimens of *aberrans* show at most dark brown frontal and facial callosities (only three specimens of the long series studied had entirely black callosities), the hyaline triangle seldom reaches much forward of the furcation while a spur of the apical spot not infrequently invades cell R_5 as in some *univittata* or *vittata;* many including the males show no reddish on the scutellum, or if so then the emphasis is usually marginal, not apical as in *striata;* the abdominal patterns are quite distinct, brighter yellow and black in *aberrans*, the 4 stripes subequal posteriorly, the lateral pair sometimes fading anteriorly on the second or third tergites, but almost never posteriorly on *each* tergite as in *striata*, while the middle pair frequently unite or are very narrowly separated anteriorly on tergite 2 in the latter, seldom unite in female *aberrans*. I have seen but 2 true *striata* with other than piceous callosities, and none with the borders of the eye pattern separated from the occipital margin as in *aberrans* although this will have to be checked in series in fresh material. A useful supplemental character in those *aberrans* with dark brown frontal callosities is the sharp delimitation of the infuscation on the facial callosities inside the sutures (also duplicated in the males), whereas in *striata*, when present, both sides of the sutures are margined.

I have one male (Minn.) with the reduced apical spot of typical *striata* in which the cubital and anal areas of the wing are subhyaline and the distal spot in cell 2nd M extends inwardly for almost a third the length of the cell, tergite 1 is black

across the anterior half with extensions to meet the stripes, the lateral of which show the same accentuation anteriorly on each segment as in the females, while the median, much heavier pair are united two-thirds of the width of tergite 2 enclosing a small, median, yellow equilateral triangle, and the facial callosities are extensively infuscated on *both* sides of the sutures.

The median pair of stripes in all but one of the 16 males of *aberrans* are also united, but the enclosed yellow triangle is larger, often acuminate and frequently half the width of tergite, there is less black on tergite 1, and the wings are extensively infuscated in all as described above for the allotype. All have small, black facial spots confined inside the sutures only and the scutellums entirely plumbeus.

The "two doubtful specimens from Illinois" at the end of Osten Sacken's original description are *aberrans*, as well as a male (Penn.) labelled "striatus ?" in his handwriting; so also is the wing figured by Brennan (1935, p. 391, no. 39), while that of Daecke (1907, pl. IV, fig. 17) indicates the more correct extent of the hyaline triangle in typical *striata*. All reared specimens reported as *striatus* by me (1931, p. 35) are also *aberrans*. Both species are taken together in series on the wing in appropriate localities.

One of the unlabelled cotypes of *striatus* O. S. ("presumably from the District of Columbia," Fairchild, 1938) was loaned for comparison through the courtesy of Mr. Nathan Banks.

C. hirsuticallus, n. sp.

Length, 7.5–10 mm. Named for the peculiar sparse hairs situated on the lateral edges of the frontal callosity in well-preserved females; after denudation, their lateral location is still marked by fine punctations in the shiny integument. The bodies of the females are greenish-gray covered with golden yellow hairs, and with paired median and often lateral black dashes on the abdomen; wings without evident apical spots, the cross-band abbreviated and broken by fenestrate areas, especially in the discal cell, and margined outwardly by an irregular whitish stripe, the hyaline areas otherwise tinted in varying degrees; anal cell widely open. Males black, eye facets separated along frontal margins, wings more extensively infuscated than in females, fenestration much reduced in the cross-bands, which also have very narrow costal extensions apically. Antennae of both, black, robust but not swollen.

Holotype ♀, 8 mm. Front a little broader than high, pale yellowish pollinose, and yellowish pilose; vertex about ocelli and callosity black, the latter broad and narrow, not quite reaching the eye margins. Face somewhat swollen but not tuberculate laterally, no mesal pollen except immediately above mouth, but lateral pollinose stripes complete to oral margin, black outside the sutures and in a complete stripe below each antenna, leaving 3 bare, yellow vertical stripes, the whole covered with shaggy, yellowish hairs. Antennae, palpi and proboscis black with concolorous hairs on the first 2; palpi blackish, not grooved. *Thorax*

deep yellowish with a narrow mesal and 2 broader lateral black lines, covered with golden yellow hair most pronounced on the pleurae. Legs dark, with yellowish shades on the fore tibiae and femora proximally, the middle and hind tibiae except apices, and the central portions of the middle and hind femora and the basal segments of these tarsi. Wings as figured (Plate 15, Fig. 3). Abdomen deep golden caudally due to vestiture, grading to greenish-gray basally, darker ventrally. The median spots on the first 2 tergites continuous to make a horseshoe not reaching the posterior margin of the second. Four spots on each of the following tergites, barely connected across the base laterally on tergite 3.

Woodland, Calif., May 8, 1933, Elwood L. Creel.

Allotype ♂, 8.5 mm. Cephalic integument and appendages black, with concolorous hair, and 2 narrow yellow, smooth stripes each from the oral margin to the base of either antenna, the lateral, facial, pollinose stripes incomplete inwardly. Eyes narrowly separated, divergent inferiorly, leaving a shiny, wrinkled, black triangular frontal callosity above the antennae. Thorax and abdomen subshiny black covered with black hair, except on dorsum of former where the hair is predominantly deep yellowish. Venter of abdomen, and middle and hind tibiae deep brown. Wings extensively infuscated to include most of the anal area and both basal cells, except small hyaline spots in apex of each; the whitish outer margin of the cross-band prominent.

Davis, Calif., March 28, 1936. In the California Academy of Sciences.

Paratypes: ♀, same data as holotype; 4 ♂♂, Davis, Calif., April 24, 1936, R. M. Bohart (3) and May 4, 1936; 12 ♀♀, Davis, 1936, April 24, R. M. Bohart (4), April 28, May 4 (3), April 21, May 19 and June, M. Cazier, May 19, 1936, A. R. Mead; ♀, Blue Lakes, Lake Co., Calif., June 1, 1938, J. Phillips. In the collections of the British and U. S. Nat'l Museums, Univ. of Calif., and Agricultural College, Davis, Calif. Acad. of Sciences; Museum of Comparative Zoology, Harvard; Univ. of Mich.; L. L. Pechuman, M. Cazier, T. H. G. Aitken, and the author. Two females, Sacramento, Calif., 4–17–30, C. W. Wilson.

This apparently localized species is very distinctive because of the peculiar wing pattern and glaucous color in the females, the sparse hairs laterally on their callosities, and the divided eyes in the black males without swollen facial callosities. The eye pattern in both sexes is more reduced than any *Chrysops* known to the writer, only the lower part of the occipital border and lower frontal spot remain, with usually a vestige of the mid-frontal spot as a reduced streak, the remainder of the eye bright green. Variation occurs in the extent of yellow on the legs and faces of the paratypes from almost totally black to predominantly yellow. The frequency of plant pollen on the bodies of both sexes suggests a specialized habitat, accounting for previous oversight.

Dr. J. C. Bequaert also recognized the distinctness of a part of the above series and graciously forwarded them to the author.

Chrysops pechumani, n. sp.

Among California material of *noctifera* were found two pairs of blackish deerflies, closely resembling the *pertinax* variety but with marked, non-intergrading (in the material studied) differences in the wing pattern.

The cross-band lacks the pronounced, though sometimes variable, tooth-like extension toward the fork of R_{4+5} in cell R_3, and practically fills cell M_3 to the wing margin instead of terminating diagonally across this cell so as to involve about two-thirds of vein M_3 and less than half of vein Cu_1; the apical spot in both sexes is much broader, and likewise separated from the cross-band by a wide hyaline interval. Comparative basal infuscation in each sex is very similar to that of *pertinax*, although the 2nd basal cell in the allotype is less hyaline apically. The male of *C. separata* Hine lacks the hyaline spots apically in the basal cells and the entire anal area is fumose, while the female has the first basal cell completely infuscated and the second hyaline, readily separating that southeastern species.

Holotype ♀, 9.5 mm. Except in wing characters, noted above, not different than *pertinax*. Body and appendages black, reddish tinges basally on the first antennal segments, middle and hind tibiae and metatarsi. Three pale-yellowish, facial pollinose stripes, the middle one incomplete below. Vestiture whitish, black on the antennae, legs except coxae and middle and hind femora, and the dorsum of the abdomen, leaving whitish patches on the sides of the first and second tergites, the lateral margins of the remainder and rather narrow middorsal patches widening behind to include most of the last two tergites, none of these overlying pale pollinosity as in some species. Cells R and 2nd M hyaline in their outer fourth (except extreme tip) and almost half respectively.

Niles, Inyo Co., Calif., April 21, 1918, C. L. Fox.

Allotype ♂, 9 mm. In close agreement with the female except for the usual sexual difference. Vestiture predominantly black with some whitish hairs inter-mixed on the lower cheeks, dorsum and chest of the thorax, fore coxae, and venter of the abdomen, and traces on the extreme lateral and reduced middorsal margins of the posterior tergites. A rather narrow, diagonal, parallel-sided spot crossing the apices of both basal cells of the wing, the outer margin of the cross-band evenly convex and the separated apical spot very broad occupying approximately half of cell R_4 as in the female.

Posmo, Calif., April 25, 1919, E. P. van Duzee. In the California Academy of Sciences.

Paratypes. ♂, Sobre Vista, Sonoma Co., Calif., June 26, 1910, J. A. Kusche. ♀, Tamalpias, Calif., May 28, 1922, C. L. Fox. In the collections of the author and the California Academy of Sciences, respectively. Another ♀ from Steen

Mts., Oregon, has similar outer wing pattern but cell 2nd M is infuscated as in the male, much more than any related females seen of *noctifera*, *pertinax*, or typical *pechumani*, and so is not included in the series.

It is not impossible that additional material might be less easily distinguished from *pertinax* as in the *carbonaria-mitis* and *aestuans-callida* complexes, but the distinctness of the wing pattern of present material justifies its specific separation rather than the subspecies treatment accorded *pertinax*.

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Summary.

Described for the first time in this paper are: *Stonemyia abaureus* n. sp. (♂, ♀) from California, *Chrysops beameri Bren.* allotype ♂, *C. callidula* new name for *C. callida* O. S., *C. abata* n. sp. (♀) from Florida, *C. aestuans abaestuans* n. subsp. (♂, ♀) from Kansas and the Rocky Mountain region, *C. aberrans* n. sp. (♂, ♀) from the Northeastern States, and *C. pechumanni* and *hirsuticallus* n. spp. (♂, ♀) from California. *Pangonia macroglossa* Westwood is removed from North American lists, being a synonym of *P. gulosa* Wied. from South Africa. New synonymy includes: *Ricardoa latiflagrum* End. = *Esenbeckia incisuralis* (Say), *C. atricornis* Bigot (♂ only) = *C. bishoppi* Bren., *C. pachycera* Will. (♂ only) = *C. coloradensis* Bigot, *C. reicherti* Fchld. = *C. flavida* Wied. subsp., *C. pilumna* Kröb. = *C. inda* O. S., *C. pertinax* Will. = *C. noctifera* O. S. subsp., *C. dilata* Rowe and Knowlton and *C. hungerfordi* Bren. = *C. pachycera* Will. subspp. Some other notes on North American Pangoniinae are included and the new name *Fidena abominata* is proposed for the Neotropical *Pangonia incisuralis* Macq. (not Say).

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Note: Dr. Philip has indicated the need for the validation of *Pilimas* Brennan (1935) by designation of genotype. *Diatomineura californica* Bigot is herewith designated as genotype of *Pilimas* and the name dates from this note. Signed, J. M. Brennan.