

BULLETIN OF THE CALIFORNIA ENTOMOLOGICAL SOCIETY
VOLUME 1954

THE COMMERCE AND DEER BEES OF CALIFORNIA

(*Diptera: Tabanidae*)

BY W. W. MULLER

BULLETIN OF THE CALIFORNIA INSECT SURVEY

VOLUME 1, NO. 1

THE HORSE FLIES AND DEER FLIES OF CALIFORNIA

(Diptera-Tabanidae)

By

W. W. Middlekauff

UNIVERSITY OF CALIFORNIA PRESS

BERKELEY AND LOS ANGELES

1950

BULLETIN OF THE CALIFORNIA INSECT SURVEY

Editors: E. O. Essig, S. B. Freeborn, E. G. Linsley, R. L. Usinger

Volume 1, No. 1, pp. 1-000, 1 plate

Submitted by Editors, March 3, 1950

Issued June 30, 1950

Price, 35 cents

UNIVERSITY OF CALIFORNIA PRESS

BERKELEY AND LOS ANGELES

CALIFORNIA

CAMBRIDGE UNIVERSITY PRESS

LONDON, ENGLAND

THE HORSE FLIES AND DEER FLIES OF CALIFORNIA

(Diptera-Tabanidae)

By

W. W. Middlekauff

(Division of Entomology and Parasitology, University of California, Berkeley)

It has been felt for some time that a key to the Tabanidae of California with a list of collection records would be of value and would stimulate further field work on these important insects. The monographs of Brennan (1935)* and Stone (1938) and the catalog of Philip (1947) summarize knowledge of the group for the Nearctic Region and provided the basis for the present paper. However, these works are not readily available to students and field collectors removed from library facilities. In addition, they cover a wide area which is usually of no immediate concern to the student of California insects. By restricting the keys to a smaller geographical area it is hoped that the interested student will find it a simple matter to identify most California Tabanidae.

Since the publication of the above-mentioned papers several new species and subspecies have been described and additional species have been recorded from California for the first time. There are now some sixty species and seven subspecies recorded from the state. It is hoped that this paper will stimulate interest and facilitate identification of California Tabanidae and will result in additional state and county records.

Previously published records are not given except for holotypes. All locality records are based upon specimens in the following collections: the California Insect Survey, University of California, Berkeley (C.I.S.); California Academy of Sciences (C.A.S.); University of California, College of Agriculture, Davis (U.C.D.); State Department of Agriculture, Sacramento (C.S.D.A.); and Department of Entomology, San Jose State College (S.J.C.).

The keys have been modified from those of the following workers; Brennan (1935); Philip (1941); Philip (1947); Stone (1938) and Pechuman (1938).

I am indebted to the officials of the above institutions for their cooperation in permitting me to study the specimens in their custody. I also gratefully acknowledge the prompt and gen-

erous help of Dr. C. B. Philip of the Rocky Mountain Laboratory, U. S. Public Health Service, Hamilton, Montana, for checking the identification of various species.

KEYS TO THE TABANIDAE OF CALIFORNIA

1. Hind tibiae with two apical, usually strong spurs.
 Subfamily Pangoniinae Loew 2
- Hind tibiae without apical spurs.
 Subfamily Tabaninae Loew 8
- 2(1). Antennae 10 segmented; flagellum with 8 divisions (7 annuli), the basal one not greatly differentiated from adjoining annulusTribe Pangonini End. 3
- Antennae with not over 7 segments; flagellum with 5 divisions (4 annuli), basal segment considerably elongated (fig. E); usually slender, picture-winged flies.Tribe Chrysopini End. 6
- 3(2). Proboscis hardly half the height of the head; palpi usually shorter than the antennae and apical segment swollen basally 4
- Proboscis about equal to height of the head; palpi subequal to length of the antennae, half or less that of the proboscis, apical segment not swollen basally 5
- 4(3). Eyes bare or only slightly pilose; wings hyaline*Apatolestes* Will. (p.2)
- Eyes and body abundantly pilose; wings fumose.*Brennania hera* (O. S.)(p.8)
- 5(3). Eyes pilose (short in ♀); stump vein (fig. A) present.*Pilimas* Bren. (p.3)
- Eyes bare; stump vein often absent.
 *Stonemyia* Bren. (p.3)
- 6(2). Eyes in life (or relaxed) "freckled" with small rounded spots; flagellum at least longer than pedicel, the latter only about one half as long as scape 7
- Eyes in life (or relaxed) with large angular spots; scape and pedicel usually subequal, the flagellum as long or

*Literature Cited, p. 21.

- longer than either, wings usually with irregular, extensive dark pictures. Chrysops Meig. (p.3)
- 7(6). Flagellum longer than 2 basal segments combined. Silvius Meig. (p.3)
- Flagellum about three-fourths as long as scape alone. Silvius subg. Zeuximyia Pech. (p.10)
- 8(1). Scape considerably longer than thick; eyes in life (or relaxed) and wings with irregular bands and spots; flagellum of antennae with 4 divisions (3 annuli) Tribe Chrysozonini Philip, Chrysozona Meig. (p. 5)
- Scape scarcely longer than thick; eyes in life banded or unicolorous; flagellum usually with 5 divisions (fig. D), (rarely fewer by apical fusion of annuli and then wings hyaline). Tribe Tabanini End. 9
- 9(8). Flagellum modified with 2 to 3 terminal annuli, the articulations more or less fused and indistinct; length 9.5 to 11mm.; abdominal tergites II-VI with three rows of small spots and posterior margins gray. Glaucops fratellus (Will.) (p.14)
- Flagellum normal, 4 distinct annuli; small to large flies; abdomen otherwise . . . 10
- 10(9). Vertex (♀) with a distinct, denuded ocellar tubercle (fig. F), or (♂) with an elevated, anteriorly shining tubercle (in doubtful cases eyes are densely pilose); eyes usually distinctly pilose. Hybomitra End. (p. 6)
- Vertex without such tubercle (flat, denuded ocellar area may be present) if raised in ♂ then completely pollinose; eyes bare, or sparsely but seldom densely (certain males) pilose 11
- 11(10). Eyes yellow or brown, distinctly pilose, particularly in males; front (♀) with callosities reduced to small isolated bare spots; a single diagonal dark band on eyes, often showing even in dried specimens Atylotus incisuralis (Macquart) (p.14)
- Eyes blackish when dried (certain males only lower area of small facets); bare or sparsely hairy, either unbanded or with more than one purple band in life; front of ♀ with a broad basal callus (fig. F). Tabanus Linn. (p. 7)
- 2(1). Front basally inflated, shining black or dark brown, pollinose only at the vertex around the ocelli 3
- Front either normally pollinose, or with a bare restricted area, not with a callus-like swelling above the subcallus. 5
- 3(2). Body entirely subshining black, the wings smoky ater Bren. (p. 8)
- Body grayish to dull blackish, only the costal cell sometimes infuscated. . . 4
- 4(3). Costal cell hyaline, palpi with pale hairs. . . comastes comastes Will. (p. 8)
- Costal cell infuscated; palpi usually with some black hairs comastes willistoni Bren. (p. 8)
- 5(2). Scutellum yellowish 6
- Scutellum blackish or cinereous 7
- 6(5). Flagellum black; front entirely pollinose when not irregularly worn parkeri Philip (p. 8)
- Flagellum mostly yellow; front with an expansive bare area albipilosus Bren. (p. 7)
- 7(5). Front very wide, height and basal width subequal; a narrow mesal, bare brown streak about two-thirds its height; cheeks unusually swollen. colei Philip (p. 8)
- Front narrower, about 1:2 or 2:5, the bare area more expansive. 8
- 8(7). Body predominantly gray; wings subhyaline; midfrontal bare area widely separated from eye margins. . similis Bren.² (p. 8)
- Body predominantly brownish or darker; wings fumose, bare area almost touching eye margins. hinei Bren. (p. 8)
- 9(1). Wings hyaline with or without infuscated costal cells or isolated clouds; at least pleural hairs largely whitish. 10
- Wings smoky, or palpal and pleural hairs black 14
- 10(9). Costal cell fumose, distinctly darker than remainder of wing. 11
- Costal cell completely hyaline. 12
- 11(10). Size not over 11 mm.; femora usually dark. . comastes willistoni Bren. (p. 8)
- Size over 11 mm.; legs often concolorous brownish. . . . comastes form ? (p. 8)
- 12(10). Palpi truncated apically, short and stubby (hairs sparse). similis Bren. (p. 8)
- Palpi elongated, more slender (sometimes obscured by long dense pile) 13

Genus Apatolestes Williston¹

1. Females; eyes not contiguous. 2
- Males; eyes contiguous. 9

¹Apatolestes rossi Philip is omitted from key because no specimens were seen. Ann. Amer. Ent. Soc. 42:451, 1949.

²Tabanus villosulus Bigot (Calif.) has been doubtfully synonymized with similis (Philip, Bull. Brook. Ent. Soc., 36:196, 1941).

- 13(12). Size 14 mm. or over; palpal and facial vestiture dense. . . colei Philip (p. 8)
- Size under 14 mm. these hairs not especially dense
- comastes comastes Will. (p. 8)
- 14(9). Shining black species. ater Bren. (p. 8)
- Dull black species with pale abdominal incisures. hinei Bren. (p. 8)

Genus Pilimas Brennan

- 1. Front subparallel, not divergent below; antennae, palpi and legs reddish including their vestiture.
- beameri Philip (p. 8)
- Front divergent below; apical half of flagellum black; palpi with black hairs; legs fuscous with dark vestiture. californica (Bigot)(p. 8)

Genus Stonemyia Brennan

- 1. Large robust species (15 mm.), black; the mesonotum of female clothed with pale-yellow pile; wing dark brown; a patch of pale-yellow hair on middle of posterior margin of second tergite
- velutina (Bigot)(p. 9)
- Body length usually less than 15 mm; body yellowish or orange with or without black markings 2
- 2(1). Proboscis long, at least equalling width of head; abdomen orange with black markings; legs black
- tranquilla fera (Will.)(p. 9)
- Proboscis shorter than width of head; abdomen and legs golden yellow 3
- 3(2). Entire thorax dark, the first tergite and terminal tergites and sternites predominantly so; spots on segments II-IV variable
- (male)³ ruficornis (Bigot)(p. 9)
- Integument of entire body and legs colorous yellowish
- (male) abaureus Philip (p. 9)

Genus Silvius Meigen

- 1. Females; eyes not contiguous 2
- Males; eyes contiguous 6
- 2(1). Wings immaculate; orange species
- gigantulus (Loew)(p. 9)
- Wings maculate; gray species 3
- 3(2). Costal cell hyaline. 4
- Costal cell infuscated 5

³Females of abaureus and ruficornis are extremely difficult to separate. See Philip. Proc. Ent. Soc. Wash. 43:114, 1941.

- 4(3). Basal callus about one-half width of front, broadly separated from eyes; veins R₂ + 3, R₄, R₅ with subapical spot. quadrivittatus (Say)(p.10)
- Basal callus distinctly more than one-half width of front, narrowly separated from eyes; veins R₂₊₃, R₄, R₅ without subapical spot
- notatus (Bigot)(p.10)

- 5(3). Scape robust; flagellum about as long as scape (Subg. Zeuximyia).
- philipi Pech. (p.10)
- Scape slender; flagellum about twice as long as scape sayi Bren. (p.10)

- 6(1). Wings immaculate; orange species.
- gigantulus (Loew)(p. 9)
- Wings maculate; gray species. 7

- 7(6). Abdomen predominantly yellowish; subapical spots on veins R₂₊₃, R₄, R₅; not densely haired species; venter of abdomen with three rows of spots.
- quadrivittatus (Say)(p.10)
- Abdomen predominantly dark; no subapical spots on veins R₂₊₃, R₄, R₅; thorax and base of abdomen with long white hair; venter of abdomen mostly dark or with a broad dark median band notatus (Bigot)(p.10)

Genus Chrysops Meigen

- 1. Females; eyes not contiguous 2
- Males; eyes contiguous 25
- 2(1). Apex of wing beyond crossband hyaline, sometimes just a trace of a cloud confined to cell R₁. 3
- Apex of wing beyond crossband distinctly infuscated 6
- 3(2). Femora banded in middle with reddish brown; abdomen greenish yellow with black markings
- hirsuticallus Phil. (p.12)
- Femora black; abdomen otherwise. 4
- 4(3). Pile of pleurae golden yellow or orange; basal abdominal tergites laterally orange excitans Walker (p.12)
- Pile of pleurae whitish to gray; abdomen black with or without grayish pile 5
- 5(4). Base of cell Cu₁ with a small hyaline spot carbonaria Walker (p.11)
- Base of cell Cu₁ infuscated; large obscure gray middorsal triangles more likely to be present.
- mitis O. S. (p.12)
- 6(2). Basal callus orange or orange with lateral and upper margins black. 7

- 6(2). * Basal callus entirely black 14
- 7(6). Hyaline triangle attains posterior margin of wing (fig. C) 8
 -- Hyaline triangle enclosed, does not attain posterior margin of wing
 fulvaster O. S. (p.12)
- 8(7). Knob of halteres brown or black; scape not incrassate.
 coloradensis Bigot (p.11)
 -- Knob of halteres yellow; scape incrassate. 9
- 9(8). First segment of flagellum distinctly longer than the sum of the four apical segments; outer margin of crossband sinuous with tooth-like projections in cells R₃ and M₁
 virgulata Bell. (p.14)
 -- First segment of flagellum not longer than the sum of the four apical segments; outer margin of crossband evenly convex or with no projection in R₃ 10
- 10(9). Apical spot of wing exceeds vein R₅.
 clavicornis Bren. (p.11)
 -- Apical spot of wing not exceeding vein R₅, as a rule occupying about half of cell R₄ 11
- 11(10). Second abdominal tergite typically with double geminate black spot; outer margin of crossband sinuous
 robusta Bren. (p.14)
 -- Second abdominal tergite with single geminate spot; outer margin of crossband straight 12
- 12(11). Scape much enlarged, widest diameter almost twice that of pedicel (fig. E)
 coquilletti Hine (p.11)
 -- Scape enlarged but widest diameter not much more than pedicel. 13
- 13(12). Abdominal tergites caudad from III with black lateral spots
 pachycera hungerfordi Bren. (p.13)
 -- Abdominal tergites caudad from III without black lateral spots
 pachycera pachycera Will. (p.13)
- 14(6). Cell 2M infuscated over at least half its length; abdominal tergites with no yellow on mid-line. 15
 -- Cell 2M hyaline, may be some infuscation at base and apex; abdominal tergites with yellow markings on mid-line and posterior margins 17
- 15(14). Dorsum of abdomen with orange spot on antero-lateral margins
 noctifera noctifera O. S. (p.12)
 -- Dorsum of abdomen black 16
- 16(15). Crossband abbreviated in cell M₃ and with a distinct tooth-like projection from the crossband in cell R₃
 noctifera pertinax Will. (p.13)
 -- Crossband practically complete to hind margin of wing and without a tooth-like projection
 pechumani Philip (p.13)
- 17(14). Radial cell hyaline, may be small amount of infuscation at base and apex. 18
 -- Radial cell infuscated over more than half its area 19
- 18(17). First abdominal tergite black, posterolateral margins may be gray
 aestuans van der Wulp (p.10)
 -- First abdominal tergite yellow with brown quadrate spot on antero-median margin bishoppi Bren. (p.11)
- 19(17). Discal cell (1st M₂) infuscated . . . 20
 -- Discal cell hyaline, may be infuscated around borders . discalis Will. (p.12)
- 20(19). Second abdominal tergite with a small black antero-median quadrate or reniform spot, the remainder of the segment yellow; face black with 3 yellow pollinose stripes
 asbestos Philip (p.10)
 -- Second abdominal tergite otherwise marked; face with some integumental yellow. 21
- 21(20). Radial cell with an infuscated band for its entire length, sometimes dilute towards outer two-thirds; a narrow hyaline line on posterior border, widest apically; fore coxae black. 22
 -- Radial cell with apical third hyaline; fore coxae yellow
 furcata Walker (p.12)
- 22(21). Second abdominal tergite with an isolated black spot laterad to geminate spot. 23
 -- Sides of second abdominal tergite entirely yellow or the black spot enlarged and connected with the median figure. 24
- 23(22). Apical spot beyond crossband narrow, not wider than the basal width of cell M₁; yellow stripe on fronto clypeus narrow. . . surda O. S. (p.14)
 -- Apical spot beyond cross band wide, about twice the basal width of cell M₁; yellow spot on fronto clypeus wider than lateral brown lobes.
 proclivis proclivis O. S. (p.13)
- 24(22). Abdominal tergite III with four, more or less distinct black spots; yellow

- spot on fronto clypeus wider than lateral brown lobes
- . . . proclivis imfurcata Philip (p.14)
- Abdominal tergite III black except for narrow yellow stripe near incisure; yellow spot on fronto clypeus reduced to a very narrow line.
- proclivis picea Philip (p.14)
- 25(1). Apex of the wing beyond the crossband hyaline 26
- Apex of the wing beyond the crossband more or less infuscated 29
- 26(25). Base of cell Cu_1 typically with a hyaline spot. . . carbonaria Walker (p.11)
- Base of cell Cu_1 infuscated 27
- 27(26). Abdominal tergites with some yellowish pubescence, especially near the apex and forming median triangles
- excitans Walker (p.12)
- Abdominal tergites black pubescent 28
- 28(27). Mid tibiae black. . . mitis O. S. (p.12)
- Mid tibiae reddish brown
- hirsuticallus Philip (p.12)
- 29(25). Apical spot approximately the same width for its entire length, including only the apex of cell R_4 30
- Apical spot not as above, variable, usually including nearly half of cell R_4 , often extending considerably beyond middle of cell 34
- 30(29). Wholly black species; fronto clypeus black; apical spot practically separated from the crossband
- noctifera pertinax Will. (p.13)
- Not wholly black species; fronto clypeus yellow; apical spot distinctly united with the crossband 31
- 31(30). Fronto clypeus and oral margins of genae yellow 32
- Fronto clypeus and oral margins of genae not entirely yellow, usually with a black spot on each side. 33
- 32(31). Wing picture dilute
- bishoppi Bren. (p.11)
- Wing picture saturate
- aestuans van der Wulp (p.10)
- 33(31). Fronto clypeus black with a narrow yellow midstreak. . . surda O. S. (p.14)
- Fronto clypeus yellow with a black spot on each side.
- proclivis proclivis O. S. (p.13)
- 34(29). Antennae incrassate (distinctly swollen) (fig. E) 35
- Antennae not incrassate. 41
- 35(34). Annulate portion of flagellum much shorter than scape
- virgulata Bell. (p.14)
- Annulate portion of flagellum not shorter than scape, usually longer. 36
- 36(35). Apical spot of the wing extending at least into cell R_5 37
- Apical spot of the wing not extending beyond vein R_5 , usually not even attaining this vein 38
- 37(36). Antennae yellowish, the scape distinctly bottle-shaped; second abdominal tergite yellow with a median broad black geminate figure and a black spot on each side. . . clavicornis Bren. (p.11)
- Antennae black, scape not bottle-shaped; second abdominal tergite not patterned as above.
- fulvaster O. S. (p.12)
- 38(36). Second abdominal tergite with a double geminate black figure
- robusta Bren. (p.14)
- Second abdominal tergite without a double geminate black figure. 39
- 39(38). Second abdominal tergite with lateral black spots.
- pachycera hungerfordi Bren. (p.13)
- Second abdominal tergite without lateral black spots 40
- 40(39). Cell 2M infuscated subequally with R; crossband sometimes fenestrate; abdominal tergites III and IV rarely with a black spot on each side
- pachycera pachycera Will. (p.13)
- Cell 2M infuscated about one-half that of R; crossband never fenestrate; abdominal tergites III and IV always with a black spot on each side
- coquilletti Hine (p.11)
- 41(34). Discal cell (1st M_2) hyaline
- discalis Will. (p.12)
- Discal cell infuscated 42
- 42(41). Body jet black. . pechumani Phil. (p.13)
- Body not entirely black. 43
- 43(42). Abdominal tergite II with a double geminate spot.
- coloradensis Bigot (p.11)
- Abdominal tergite II with a small black antero-median quadrate spot
- asbestos Philip (p.10)
- Genus Chrysozona Meigen
1. Size medium, 9-10mm.; tibiae with pale rings broad, those of the fore pair occupying at least the basal third; pale sinuous, subapical wing band not

1. reaching hind margin; fore tibiae not greatly swollen : americana (O. S.) (p.14)
- . Size small, 6-7.5mm.; tibial rings very narrow the anterior rings not over the basal fourth of the fore tibiae; subapical wing band crossing to hind margin; fore tibiae strongly dilated n.sp. Philip MS
- Genus Hybomitra Enderlein⁴
1. Females; eyes not contiguous 2
- . Males; eyes contiguous 13
- 2(1). Entirely black, including pubescence and pollinosity. . . procyon (O. S.) (p.16)
- . Not entirely black 3
- 3(2). Abdomen broadly orange brown laterally, tergites II and III usually unicolorous orange to margins; the median black area usually constricted on tergite III; sublateral pale spots not conspicuous. 4
- . Abdomen not broadly orange laterally; if paler laterally, the median dark area is rather broad and not constricted on tergite III; sublateral pale spots, if present, distinct. 9
- 4(3). Hind tibial fringe well developed, mostly golden orange; length usually 18mm. or more; prescutal lobe yellowish. californica (Marten) (p.15)
- . Hind tibial fringe weak, or, if well developed, not golden orange, frequently black; prescutal lobe reddish, usually less than 18mm 5
- 5(4). Antenna black, rarely with a little orange on second and base of third segments; third segment narrow, with obtuse dorsal angle and little if any dorsal excision; vein R₄ often with a stump 6
- . Not with this combination of characters. 8
- 6(5). Frons slightly less than three times as high as wide, the sides nearly parallel. philipi (Stone) (p.16)
- . Frons about four times as high as width at base, usually somewhat divergent above 7
- 7(6). Venter of abdomen with mostly yellowish hair, although there may be some scattered black hairs medianly sonomensis sonomensis (O.S.)(p.16)
- . Venter of abdomen nearly uniformly clothed with fine black hair, the yellowish hair usually sparse except along incisures sonomensis phaenops (O.S.) (p.18)
- 8(5). Subcallus pollinose haemaphora (Marten) (p.15)
- . Subcallus denuded captonis (Marten) (p.15)
- 9(3). Subcallus denuded, shining. 10
- . Subcallus pollinose 12
- 10(9). Prescutal lobe black. rhombica (O.S.) (p.16)
- . Prescutal lobe reddish brown. 11
- 11(10). Stump vein usually present; length 15mm. or more; frons usually over three and one-half times as high as width at base. . tetrica tetrica (Marten)(p.17)
- . Stump vein usually absent; length 14mm. or less; frons about three times as high as width at base melanorhina (Bigot) (p.15)
- 12(9). Stump vein usually present; pollen of head gray tetrica hirtula (Bigot)(p.17)
- . Stump vein rarely present; pollen around face usually faintly tinged with yellowish. opaca (Coquillett) (p.15)
- 13(1). Entirely black including palpus procyon (O. S.) (p.16)
- . Not entirely black. 14
- 14(13). Abdomen broadly orange brown laterally, the median black area usually constricted on tergite III; sublateral pale spots not conspicuous. 15
- . Abdomen not broadly orange brown laterally; if paler laterally, the median dark area rather broad and not constricted on tergite III; sublateral pale spots, if present, distinct 18
- 15(14). Antennae red with black annuli. californica (Marten) (p.15)
- . Antennae with black more extensive. . 16
- 16(15). Venter with black hair rather sparse, and, at least sublaterally a considerable amount of yellowish hair . . 17
- . Venter with only black hair sonomensis phaenops (O.S.)(p.17)
- 17(16). Second sternite with a large black median spot; second palpal segment stout, but apex not acute sonomensis sonomensis (O.S.)(p.16)
- . Second sternite with scarcely any black medianly; second palpal segment stout, with apex acute haemaphora (Marten) (p.15)

⁴The following species are not included in the key to the males either because this sex is unknown or because specimens were unavailable: captonis and philipi.

- 18(14). Prescutal lobe black (subcallus denuded) rhombica (O.S.) (p.16)
 -- Prescutal lobe pale, reddish orange. .19
- 19(18). Subcallus denuded
 melanorhina (Bigot) (p.15)
 -- Subcallus pollinose 20
- 20(19). Stump vein present.
 tetrica (Marten) (p.17)
 -- Stump vein absent . . opaca (Coq.) (p.15)

Genus Tabanus Linnaeus

1. Females; eyes not contiguous 2
 -- Males; eyes contiguous 10
- 2(1). Abdominal tergites with both median and sublateral pale spots, those of median row may be contiguous but do not form a parallel-sided stripe. 3
 -- Abdominal tergites without sublateral pale spots or median row of spots contiguous forming a parallel-sided stripe 4
- 3(2). Eyes sparsely pilose (high power); furcation without a black spot
 laticeps Hine (p.17)
 -- Eyes bare; furcation with a black spot
 monoensis Hine (p.18)
- 4(2). Abdomen unicolorous black or rarely with a median row of small whitish triangles 5
 -- Median dorsal row of spots contiguous, forming a more or less distinct parallel-sided stripe. 7
- 5(4). Furcation without a distinct dark spot, although entire wing may be infuscated; mesonotum and fore tibiae black 6
 -- Furcation usually with a distinct dark spot; mesonotum covered with creamy hair over a dark-reddish background; fore tibiae bicolored.
 punctifer O. S. (p.18)
- 6(5). At least tergite I with an inconspicuous tuft of white hairs beneath the scutellum; frontal callosity subquadrate, the median callus narrow
 kesseli Philip (p. 20)
 -- None of tergites with median tufts of white hairs; frontal callosity merging broadly with median callus above
 aegrotus (O. S.) (p.17)
- 7(4). Base of vein R₄ with stump vein.
 productus Hine (p.18)
 -- Base of vein R₄ without stump vein 8
- 8(7). Eyes pilose; median spot a triangle on tergite II. stonei Philip (p.19)
- Eyes bare; median spot on tergite II rectangular 9
- 9(8). Outer hind tibial fringe mostly black; body markings contrasting; front usually evenly convergent
 lineola scutellaris Wlk. (p.18)
 -- Outer hind tibial fringe mostly white, body color faded in appearance, the middorsal stripe not especially paler than the sublateral ones; frontal margins rather bowed in the middle.
 vittiger nippontucki Philip (p.19)
- 10(1). Eyes pilose 11
 -- Eyes bare, or only sparsely pilose. .12
- 11(10). Abdomen with a median row of pale spots forming a parallel-sided stripe; upper eye facets greatly enlarged
 vittiger nippontucki Philip (p.19)
 -- Abdomen without a parallel-sided stripe; four black spots on abdominal tergite II; upper eye facets not greatly enlarged. laticeps Hine (p.17)
- 12(10). Abdomen unicolorous, black (rarely a median row of small whitish-haired triangles). 13
 -- Abdomen not unicolorous 15
- 13(12). Mesonotum black; no spot at furcation 14
 -- Mesonotum bordered by a band of whitish pile, spot at furcation
 punctifer O. S. (p.18)
- 14(13). Eyes with distinct upper area of enlarged facets; a tuft of white hairs beneath scutellum on tergite I.
 kesseli Philip (p. 20)
 -- Eyes with upper facets but little differentiated; abdomen entirely black-haired. aegrotus (O. S.) (p.17)
- 15(12). Abdomen with a median row of pale spots forming a parallel-sided stripe . . 16
 -- Abdomen not so colored; furcation with a dilute infuscated spot
 monoensis Hine (p.18)
- 16(15). Stump vein present; antennae mostly black productus Hine (p.18)
 -- Stump vein absent; antennae pale
 lineola scutellaris Wlk. (p.18)

Apatolestes albipilosus Brennan

Apatolestes albipilosus Brennan, 1935, Univ. Kans. Sci., Bull., 22:371. Type, ♀, Lemon Cove, Calif. Male unknown.
States recorded from: Calif.
California records: No specimens seen.

Apatolestes ater Brennan

Apatolestes ater Brennan, 1935, Univ. Kans. Sci. Bull., 22:371. Type, ♀, San Diego, Calif.
States recorded from: Calif.

California records:

LOS ANGELES CO.: Mint Canyon, ♀, VI-22-49 (H. E. Cott, C.I.S.).
RIVERSIDE CO.: Morongo V., ♀, V-23-41; ♂, V-24-41 (E. C. VanDyke, C.A.S.).
Vandeventer Flat, Santa Rosa Mts., ♀, VI-11-40 (Adachi, C.A.S.).

Apatolestes colei Philip

Apatolestes colei Philip, 1941, Bull. Brook. Ent. Soc., 36:192. Type, ♀, La Quinta, Calif.
States recorded from: Calif.
California records: No specimens seen.

Apatolestes comastes comastes Williston

Apatolestes comastes Williston, 1885, Ent. Amer., 1:12. Cotypes, 2♀, Calif.
States recorded from: Calif.
California records:

LAKE CO.: Hullville, ♀, VI-1917 (C. Reynolds, C.A.S.).

LASSEN CO.: 2 mi. N. W. Blue Lake, ♀, VII-19-47 (R. L. Usinger, C.I.S.).

MARIPOSA CO.: Yosemite Val., ♀, VI-28-21 (E. C. VanDyke, C.A.S.).

RIVERSIDE CO.: Santa Rosa Pk., 8000'elev., 3♀, VI-22-40 (E. C. VanDyke, C.A.S.).
Pinyon Flat, ♀, VI-21-41 (E. C. VanDyke, C.A.S.).
Pine Flat, San Jacinto Mts., ♂, VI-15-40 (C. D. Michener, C.A.S.).

SAN BERNARDINO CO.: Cajon Pass, ♂, VI-27-41 (E. C. VanDyke, C.A.S.).

SAN DIEGO CO.: Borego, ♀, IV-25-49 (J. E. Gillaspay, C.I.S.). Borego V., 37♀, VI-20, 21-41 (E. C. VanDyke, C.A.S.). S. Felipe Grade, ♀, V-22-41 (E. C. VanDyke, C.A.S.).

Apatolestes comastes willistonii Brennan

Apatolestes comastes willistonii Brennan, 1935, Univ. Kans. Sci. Bull., 22:373. Type, ♀, San Diego Co., Calif.
States recorded from: Ariz., Calif., Ore., Mont., B.C.

California records:

RIVERSIDE CO.: Cottonwood Springs, ♀, IV-26-49 (L. W. Quate, C.I.S.); ♀, IV-26-49 (J. E. Gillaspay, C.I.S.). Santa Rosa Pk., 8000'elev., ♀, VI-22-40; ♀, VI-18-40 (E. C. Van Dyke, C.A.S.).
Gilman Hot Springs, ♀, VI-23-41 (E. C. VanDyke, C.A.S.).

SAN BERNARDINO CO.: Forest Home, ♀, V-5-36 (Timberlake, C.I.S.).

Apatolestes hinei Brennan

Apatolestes hinei Brennan, 1935, Univ. Kans. Sci. Bull., 22:374. Type, ♀, San Jacinto Mt., Calif.
States recorded from: Calif.

California records:

MARIPOSA CO.: Yosemite National Park, ♀, VII-24-48 (C.I.S.).

Apatolestes parkeri Philip

Apatolestes parkeri Philip, 1941, Bull. Brook. Ent. Soc., 36:193. Type, ♂, Ehrenberg, Ariz.
States recorded from: Ariz., Calif.

California records:

IMPERIAL CO.: Meloland, ♀, VI-9-49 (R. v. d. Bosch, C.I.S.).

RIVERSIDE CO.: Blythe, 3♀, VI-23-45; ♂, VI-23-45 (C.I.S.).

Apatolestes similis Brennan

Apatolestes similis Brennan, 1935, Univ. Kans. Sci. Bull., 22:374. Type ♀, Los Angeles Co., Calif.

States recorded from: Ariz., Calif., Utah.

California records:

CONTRA COSTA CO.: Antioch, ♂, IX-8-48 (P. D. Hurd, C.I.S.).

Brennania hera (Osten Sacken)

Pangonia hera Osten Sacken, 1877, West. Dipt., p. 214. Type, ♀, San Francisco, Calif.

States recorded from: Calif.

California records:

MONTEREY CO.: Carmel, ♀, VIII-21-21 (L. S. Slevin, C.A.S.).

SAN FRANCISCO CO.: San Francisco, 2♀, VII-24-20 (E. P. Van Duzee, C.A.S.); ♂, VII-19-28 (E. G. Linsley, C.A.S.); 3♂, VII-25-25 (H. H. Keifer, C.A.S.); ♂, IX-35 (E. S. Ross, C.A.S.).
Lone Mt., ♂, VI-1925 (F. X. Williams, C.A.S.).

SAN MATEO CO.: Colma, 2♀, 5♂, VIII-15-11; ♀, VIII-5-11; ♀, ♂, VIII-12-11; 3♀, 4♂, VIII-30-11 (J. A. Kusche, C.A.S.); ♀, VIII-5-11 (J. A. Kusche, C.I.S.).

Pilimas beameri Philip

Pilimas beameri Philip, 1942, Proc. N. Eng. Zool. Club, 21:61. Type, ♀, Colton, San Bernardino Co., Calif.

States recorded from: Calif.

California records: No specimens seen.

Pilimas californica (Bigot)⁵

Diatomineura californica Bigot, 1892, Mem. Soc. Zool. Fr., 5:618. Type, ♂, Calif.

States recorded from: B. C., Calif., Idaho, Mont., Ore., Utah, Wash.

California records:

⁵Pangonia dives Williston and Silvius jonesi Cresson are synonyms of Pilimas californica (Bigot) which have been recorded from California.

CALAVERAS CO.: Camp Wolfboro, ♂, VII-11-39 (T. Aitken, C.A.S.).

MARIPOSA CO.: Wawona, 7000' elev., ♂, VII-17-46 (H. P. Chandler, C.I.S.).

MODOC CO.: Buck Creek, ♀, VII-21-22 (C. L. Fox, C.A.S.). Davis Creek, ♂, VII-15-23 (C.A.S.).

NEVADA CO.: Truckee, ♀, VIII-39 (L. Gillogly, U.C.D.).

PLACER CO.: ♀, VII-18-22 (E. R. Leach, C.A.S.). Auburn, ♀, VII-35 (F. T. Scott, C.S.D.A.).

PLUMAS CO.: Quincy, 9♂, VII-7-49 (D. J. Gould, C.I.S.); ♂, VI-30-49; ♀, VII-9-49 (P. D. Hurd, C.I.S.); ♀, VII-13-49 (R. G. Howell, C.I.S., Ovipositing in water like dragonfly.)

RIVERSIDE CO.: Herkey Creek, San Jacinto Mts., ♂, VI-10-40 (C.I.S.); ♀, VI-10-40 (C.I.S.). San Gabriel Mts., Switzer's Trail, 3500' elev. 4♀, ♂, VI-10-14 (F. Grinnell, Jr., C.A.S.).

SANTA BARBARA CO.: Sunset Val., ♀, VII-4-38 (V. L. Woolley, C.A.S.). Fillmore, ♂, VII-27-37 (B. E. White, C.A.S.). Sonora Pass, ♂, VII-7-39 (T. Aitken, M. Cazier, C.A.S.).

SHASTA CO.: 2♂, VI-27-21 (J. A. Kusche, C.A.S.).

SIERRA CO.: St. Charles Hill, 2♀, VII-7-26 (E. A. Nast, C.A.S.).

SISKIYOU CO.: 5♀, 2♂, VII-15-1921 (J. A. Kusche, C.A.S.). Etna, ♂, VII-9-39 (F. D. Horn, C.A.S.). Shasta Springs, 7♂, VII-1914 (C. L. Fox, C.A.S.).

TUOLUMNE CO.: Fletcher Lake, Yosemite Nat. Pk., 10,400' elev., 34♂, VII-27-40 (E. G. Linsley, C.I.S.); 2♂, same data (C.A.S.).

Stonemyia abaureus Philip⁶

Stonemyia abaureus Philip, 1941, Proc. Ent. Soc. Wash., 43:114. Type, ♂, Patrick Creek, Calif.

States recorded from: Calif., Wyo.?

California records:

NEVADA CO.: ♀, VIII-13-20 (E. R. Leach, C.A.S.).

RIVERSIDE CO.: Vandevanter Flat, Santa Rosa Mts., ♂, VI-16-40 (H. T. Reynolds, C.I.S.).

Pinon Flat, San Jacinto Mts., ♂, V-30-39 (P. D. Gerhart, C.A.S., paratype); 16♀, 7♂, VI-14-21-41 (E. C. VanDyke, C.A.S.). Idyllwild, San Jacinto Mts., ♂, VI-16-40 (E. C. VanDyke, C.A.S.). Keen Camp, San Jacinto Mts., ♀, VIII-5-39 (P. D. Gerhart, C.A.S., paratype).

SANTA BARBARA CO.: Sunset Valley, ♂, VI-39 (B. White, C.A.S., paratype).

SHASTA CO.: Cayton, ♂, VII-15-18 (E. P. VanDuzee, C.A.S.).

TULARE CO.: Potwisha, Sequoia Nat'l. Pk., 2000-5000' elev., ♂, VI-20-29; ♀, VII-1-41 (E. C. VanDyke, C.A.S.). Mineral King, ♀, VII-31-35 (G. E. Bohart, C.I.S., paratype). Hot Springs, ♀, VII-7-25 (E. R. Leach, C.A.S.).

⁶Pangonia ruficornis of authors, not Bigot and Stonemyia ruficornis Brennan were misidentifications of Stonemyia abaureus Philip.

Stonemyia ruficornis (Bigot)

Corizoneura ruficornis Bigot, 1892, Mem. Soc. Zool. Fr., 5:615. Cotypes, 2♂, Calif.

States recorded from: Calif.

California records:

MADERA CO.: Yosemite Fork, 2♀, 2♂, VI-8-40 (Brookman, Aitken, Cazier, VanDyke, C.A.S.).

MARIPOSA CO.: ♂, VI-13-38 (N. F. Hardman, C.I.S.). Morman Bar, ♀, VI-7-40 (Brookman, Cazier, VanDyke, C.I.S.).

Stonemyia tranquilla fera (Williston)

Pangonia fera Williston, 1887, Trans. Kans.

Acad. Sci., 10:130. Type, ♂, Mt. Hood, Ore.

States recorded from: Calif., Ga., Idaho, Me., Ore., Wash.

California records:

ALPINE CO.: Hope Valley, ♀, VII-18-48 (J. W. MacSwain, C.I.S.). Alpine Lake, ♀, VIII-6-18 (C.A.S.).

ELDORADO CO.: Glen Alpine, ♂, VII-09 (F. X. Williams, C.A.S.).

MARIPOSA CO.: Yosemite Val., 3♂, ♀, VII-5-21 (E. C. VanDyke, C.A.S.).

NEVADA CO.: Donner Pass, ♂, VI-18-40 (Cazier, Aitken, C.A.S.).

SIERRA CO.: Gold Lake, ♀, VII-22-21 (C. L. Fox, C.A.S.).

SONOMA CO.: ♂, (C.A.S.).

Stonemyia velutina (Bigot)⁷

Corizoneura velutina Bigot, 1892, Mem. Soc.

Zool. Fr., 5:615. Type, ♀, Calif.

States recorded from: Calif.

California records:

MADERA CO.: Oakhurst, ♀, VI-8-42 (E. G. Linsley, C.I.S.). Bass Lake, 2500' elev., ♂, VI-7-38 (N. F. Hardman, C.A.S., Paratype). Yosemite, 3880-4000' elev., ♂, VI-14-38 (J. R. Warren, C.A.S.).

Silvius gigantulus (Loew)

Chrysops gigantulus Loew, 1872, Dipt. Amer.

Sept. ind., II, p. 233 (p. 10, No. 12).

Type, ♀, Calif.

States recorded from: B. C., Calif., Colo., Idaho, Mont., Nebr., N. M., Ore., Wash., Wyo.

California records:

ALPINE CO.: Hope Valley, 2♀, VII-17-48 (C.I.S.); ♀, VI-18-48 (J. W. MacSwain, C.I.S.).

CONTRA COSTA CO.: Mt. Diablo, ♀, VI-5-40 (T. Aitken, C.A.S.).

ELDORADO CO.: 3 mi. S. Camino, ♀, VI-26-48 (P. D. Hurd, C.I.S.). Snowline Camp, ♀, VI-29-48 (P. D. Hurd, C.I.S.). China Flat, ♀, VII-15-48 (L. W. Quate, C.I.S.).

Echo Lake, 7400' elev., ♀, VII-30-25 (E. O. Essig, C.I.S.). Fallen Leaf Lake, 2♀, VII-11, 15-1915 (E. C. VanDyke, C.A.S.); ♀, VII-10-35 (F. E. Blaisdell, C.A.S.).

Glen Alpine, ♀, VII-1909 (F. X. Williams, C.A.S.). Strawberry Val., 2♀, VIII-6-12 (E. C. VanDyke, C.A.S.).

Stonemyia albomaculata Stone is a synonym of velutina which has been recorded from California.

FRESNO CO.: Paradise Valley, King's River, 7000' elev., ♀, VII-15, 16-1910 (E. C. VanDyke, C.A.S.). S. Fork King's River Canyon, 5000' elev., ♀, VII-6-10 (E. C. VanDyke, C.A.S.). Huntington Lake, 7000' elev., ♀, VII-12-19; ♀, VIII-24-19 (E. P. VanDuzee, C.A.S.).

LASSEN CO.: Susan Riv. Camp, ♀, VII-9-49 (A. T. McClay, U.C.D.).

LOS ANGELES CO.: Elizabeth Lake, ♀, V-28-27 (A. C. Davis, C.A.S.).

MADERA CO.: ♀, V-24-36 (E. S. Ross, C.A.S.). Bass Lake, ♀, VI-7-38 (F. C. Zabaldano, C.A.S.). Big Sandy Flat, ♀, VII-15-46 (R. P. Watwood, U.C.D.). Upper Soda Springs, ♀, VII-40 (D. L. Dow, U.C.D.).

MARIPOSA CO.: Yosemite, 4♀, 4♂, VI-13-21 (C.I.S.); 8♂, 7♀, VI-8, 9-21 (E. C. VanDyke, C.A.S.). Tenaya Lake Trail, Yosemite, ♀, VIII-4-36 (E. C. Hendee, U.C.D.).

MENDOCINO CO.: Ryan Creek, ♀, VI-7-46 (C.I.S.).

PLACER CO.: Cisco, 2♀, VII-1911 (C. VanGeldern, C.A.S.); ♀, VIII-1-22 (Ricksecker, C.A.S.). Auburn, ♀, VII-30-32 (C.A.S.).

RIVERSIDE CO.: Gilman Hot Springs, ♀, VI-10-41 (E. C. VanDyke, C.A.S.). Santa Rosa Mountain, Santa Rosa Mountains, ♀, VI-18-40 (C.I.S.). Idyllwild, San Jacinto Mts., 4♀, ♂, VI-17-21-1940 (E. C. VanDyke, C.A.S.).

SAN MATEO CO.: Pescadero, ♀, VII-15-17 (C.A.S.).

SIERRA CO.: Gold Lake, 2♀, ♂, VII-16-31-1921 (C. L. Fox, C.A.S.).

TULARE CO.: 3 Rivers, ♀, VII-29-23 (C. L. Fox, C.A.S.). Mineral King, 2♀, VII-21-31-1923 (C. L. Fox, C.A.S.).

TUOLUMNE CO.: Yosemite National Park, Vernon Lake, ♂, VII-28-38 (C.I.S.). Tilden Creek, ♂, VII-30-38 (C.I.S.). Sonora Pass, ♀, VIII-18-48 (C.I.S.). Tuolumne Meadows, ♀, VIII-1-15 (C. L. Fox, C.A.S.); ♀, VII-15-40 (D. L. Dow, U.C.D.).

Silvius notatus (Bigot)⁸

Diachlorus notatus Bigot, 1892, Mem. Soc. Zool. Fr., 5:623. Type, ♀, Calif.

States recorded from: Calif., Ore., Wash.
California records:

INYO CO.: Death Valley, Furnace Cr., ♀, III-22-40 (B. Brookman, C.I.S.); 2♀ same data (C.A.S.).

LASSEN CO.: Hallelujah Jct., 2♀, VI-27-49; ♀, VII-7-49; ♀, VIII-13-49; ♀, VII-4-49, (J. W. MacSwain, C.I.S.); ♀, VII-4-49 (J. E. Gillaspay, C.I.S.); 2♀, VII-13-49 (P. D. Hurd, C.I.S.); ♀, VII-4-49; ♀, VII-27-49 (Claude I. Smith, C.I.S.).

MONTEREY CO.: Jolon, ♀, V-20-42 (J. K. Ellsworth, T. Aarons coll.).

SAN BERNARDINO CO.: Yermo, ♂, V-23-40 (Reeves, Cazier, Ting, C.A.S.).

SAN DIEGO CO.: Poway, 2♀, V-25-84 (F. E. Blaisdell, C.A.S.).

SONOMA CO.: Cazadero, ♀, IX-2-18 (E. P. VanDuzee, C.A.S.).

⁸Silvius laticallus Brennan is a synonym of notatus (Bigot) which has been recorded from California.

TRINITY CO.: Carrville, 2400-2500' elev., ♂, VI-5-34 (E. C. VanDyke, C.A.S.).

VENTURA CO.: Santa Paula, ♂, VII-23 (Dean Burk, C.I.S.).

YOLO-SOLANO COS.: Putah Canyon, ♂, V-1-46 (G. E. Bohart, C.A.S.).

Silvius (Zeuximyia) philipi Pechuman

Silvius philipi Pechuman, 1938, Can. Ent.

70:165. Type, ♀, near Lebanon, Ore. Male unknown.

States recorded from: *Calif., Ore.

California records:

*HUMBOLDT CO.: Van Dusen River, ♀, VIII-11-48 (W. W. Wirth, C.I.S.).

Silvius quadrivittatus (Say)

Chrysops quadrivittatus Say, 1823, Jour. Acad.

Nat. Sci. Phila., 3:33. Cotypes, unstated no. ♀, near the Rocky Mts.; lost.

States recorded from: Ariz., Calif., Colo.,

Idaho, Ill., Kans., Minn., Mo., Mont.,

Neb., N. M., Nev., Okla., S. D., Tex., Utah, Wyo.

California records:

RIVERSIDE CO.: Gilman Hot Sprs., ♀, V-14-41 (E. C. VanDyke, C.A.S.).

SAN DIEGO CO.: Desert edge, 5♀, IV-17-15 (M. C. VanDuzee, C.A.S.).

Silvius sayi Brennan

Silvius sayi Brennan, 1935, Univ. Kans. Sci.

Bull., 22:357. Type, ♀, Texas. Male unknown.

States recorded from: Calif., Tex.

California records: no specimens seen.

Chrysops aestuans van der Wulp

Chrysops aestuans van der Wulp, 1867, Tijdsch.

v. Ent., 10:135. Type, ♀, Kumlain, Wisc.

States recorded from: Alask., Alta., B. C.,

Calif., Colo., Idaho, Ill., Ind., Kans., Ky.,

Man., Mich., Minn., Mont., Neb., Nev., N. M.,

N. Y., N. D., Ohio, Ont., Ore., Que., Sask.,

S. D., Utah, Wash., Wisc., Wyo.

California records: no specimens seen.

Chrysops asbestos Philip

Chrysops asbestos Philip, 1949, Ann. Amer. Ent.

Soc., 42:455. Holotype ♀, Ravalli Co.,

Mont. Allotype ♂, Gold Lake, Sierra Co.,

Calif.

States recorded from: Calif., Mont., Ore.,

Wash., Idaho, Wyo., B. C.

California records:

PLUMAS CO.: Meadow Valley, 3500-4000' elev.,

♀, VI-7-24 (C.I.S.). Quincy, ♀, VI-30-49

(P. D. Hurd, C.I.S.).

SHASTA CO.: Lassen Pk., 7500' elev., ♂,

VII-18-49 (J. W. MacSwain, C.I.S.).

*New state record.

Chrysops bishoppi Brennan

Chrysops bishoppi Brennan, 1935, Univ. Kans. Sci. Bull., 22:266. Type, ♀, Topaz, Calif. States recorded from: Calif., Ore.

California records:

INYO CO.: Big Pine Creek, 4500' elev. ♀, VI-13-42 (R. Bohart, U.C.D.).
 MODOC CO.: Davis Creek, ♀, VII-12-22 (C. L. Fox, C.A.S.).
 MONO CO.: Coleville, 2♀, V-28-39 (T. G. Aitken, C.I.S.); ♀, V-28-39 (T. G. Aitken, C.A.S.). Leavitt M., ♀, VI-24-37 (J. H. Mitchell, C.A.S.).

Chrysops carbonaria Walker

Chrysops carbonaria Walker, 1848, List, I. p. 203. Cotypes, 2♀, Nova Scotia. States recorded from: Alas., Alta., B.C., Calif., Colo., D.C., Conn., Del., Ga., Idaho, Man., Md., Mass., Me., Mich., Mont., Neb., N.H., N.J., N.Y., N.C., N.F., N.S., Ohio, N.D., Ont., Ore., Pa., Que., R.I., Sask., S.D., Utah, Va., Wis., Wyo. California records: no specimens seen.

Chrysops clavicornis Brennan

Chrysops clavicornis Brennan, 1935, Univ. Kans. Sci. Bull., 22:277. Type ♀, San Diego, Calif. States recorded from: Calif., Nev.

California records:

INYO CO.: Lone Pine, ♀, VI-9-37 (N. W. Frazier, C.I.S.); ♂, VI-1-37 (Aitken, C.A.S.); ♀, VI-16-37 (L. R. Gillogly, C.A.S.). Lone Pine, Alabama Hills, ♂, VI-16-37 (E. C. Van Dyke, C.A.S.). Bishop, ♀, VI-20-29 (E. P. Van Duzee, C.A.S.). Independence, ♂, VI-14-37 (L. R. Gillogly, C.A.S.).
 KERN CO.: Arvin, ♂, VI-14-38 (F. D. Horn, C.I.S.).
 MADERA CO.: North Fork, ♀, VI-8-40 (Brookman, Aitken, Cazier, C.A.S.).
 RIVERSIDE CO.: Idyllwild, San Jacinto Mts., ♀, V-26-39 (E. S. Ross, C.I.S.). Herkey Creek, San Jacinto Mts., ♀, VI-13-39 (E. S. Ross, C.I.S.). Soboba, ♀, 2♂, VI-3, 5-17 (E. P. Van Duzee, C.A.S.).
 SAN BERNARDINO CO.: Ontario, ♀, VII-13-07 (C.A.S.). Cajon Pass, ♀, VI-11-41 (E. C. Van Dyke, C.A.S.).
 SAN DIEGO CO.: Oak Grove, ♂, VI-7-40 (C.I.S.).

Chrysops coloradensis Bigot

Chrysops coloradensis Bigot, 1892, Mem. Soc. Zool. Fr., 5:605. Cotypes, 5♂, 5♀, Colorado. States recorded from: B. C., Calif., Colo., Nev., Ore., Wash.

California records:

BUTTE CO.: Oroville, 9♀, V-9, 10-21 (C.I.S.); ♀, V-10-21 (C.A.S.).
 COLUSA CO.: Colusa, ♀, VIII-9-27 (J. F. Lamiman, C.I.S.); 2♀, VIII-6-32 (C. M. Wheeler, C.I.S.). Williams, 10♀, VII-7-48 (W. Middlekauff, C.I.S.); ♀, VI-30-48 (W. Middlekauff, C.I.S.).

CONTRA COSTA CO.: Antioch, ♀, VI-2-40 (B. Brookman, C.I.S.); ♀, VI-3-36 (A. R. Mead, C.A.S.); 2♀, VI-27-37 (M. Cazier, C.A.S.). Brentwood, ♀, VII-4-38 (M. Cazier, C.A.S.).

GLENN CO.: Orland, ♀, V-28-29 (C.S.D.A.).

KERN CO.: Lake Buena Vista, 2♀, VII-26-39 (R. F. Smith, C.A.S.).

LAKE CO.: Lower Clear Lake, ♂, V-25-41 (S.J.C.).

MENDOCINO CO.: 9 E. Mendocino, 2♀, VII-16-41 (T. Aarons, T. Aarons coll.).

MERCED CO.: Dos Palos, ♀, VII-18-46 (R. F. Smith, C.I.S.); ♂, VI-15-48 (C. A. Hanson, C.I.S.). Panoche Hills, ♀, IV-29-22 (E. C. VanDyke, C.A.S.).

PLACER CO.: Gold Run, ♀, VII-5-42 (G. Beevor, C.S.D.A.).

PLUMAS CO.: Lake Almanor, 2♀, VII-8-49 (J. E. Gillaspay, C.I.S.); 4♀; (P. D. Hurd, C.I.S.); 2♀ (E. G. Linsley, C.I.S.). Keddie, ♂, VI-15-40 (M. Cazier, T. Aitken, C.A.S.).

SAN BERNARDINO CO.: Mill Creek, 7500' elev., 2♀, VII-42 (R. Bohart, U.C.D.).

SAN JOAQUIN CO.: Tracy, ♀, VII-37 (E. S. Ross, C.A.S.).

SAN MATEO CO.: La Honda, ♀, V-4-31 (C. D. Duncan, S.J.C.).

SANTA CRUZ CO.: Santa Cruz, ♀, VI-36 (C.A.S.).

SIERRA CO.: Gold Lake, ♀, VII-12-21 (C. E. Fox, C.A.S.).

SONOMA CO.: Sobre Vista, ♀, VI-26-10 (J. A. Kusche, C.A.S.).

TULARE CO.: Wood Lake, 2♀, IV-13-22-49 (N. Frazier, C.I.S.).

VENTURA CO.: Santa Paula, ♀, VII-23 (D. Burk, C.I.S.). Saticoy, 2♀, VII-1-27 (Joe Ellsworth, C.A.S.).

YOLO CO.: Knights Landing, 2♀, VIII-18-40 (C.I.S.); ♀, IX-17-42 (P. Galindo, T. Keller, C.I.S.). Woodland, 4♀, V-8-46 (W. Middlekauff, C.I.S.); ♀, V-8-38 (W. B. Herms, C.A.S.). Davis, ♂, IV-24-36 (R. M. Bohart, C.I.S.); ♂, VI-13-48 (H. E. Cott, C.I.S.). Bryte, ♀, VI-12-45 (C. M. Herman, C.I.S.); 3♂, 2♀, IV-29-47 (A. T. McClay, U.C.D.); 2♀, V-22-48 (A. T. McClay, U.C.D.); 3♀, V-2-47 (C. Gillam, A. T. McClay); 2♀, IV-4-36 (R. M. Bohart, U.C.D.); ♀, VI-15-46 (R. Bohart, U.C.D.). Robbins, 5♀, VII-3-39 (T. Aitken, M. Cazier, C.A.S.). Clarksburg, ♀, VI-7-33 (C.A.S.); ♀, V-12-39 (N. A. Olson, C.A.S.).

Chrysops coquilletti Hine

Chrysops coquilletti Hine, 1904, Ohio Nat., 5:220. Cotypes "number of specimens," both sexes (lectotype, ♀, Los Angeles Co., Calif.). States recorded from: Calif., Utah.

California records:

CONTRA COSTA CO.: Brentwood, ♀, VIII-1-40 (C.I.S.). Antioch, ♀, VII-20-37 (M. Cazier, C.A.S.); ♀, VII-25-40 (C.I.S.).

MERCED CO.: Merced, ♀, VII-2-29 (C.S.D.A.).

NEVADA CO.: Truckee, ♀, VII-17-39 (C. T. Sierra, C.A.S.).

SAN DIEGO CO.: San Diego, ♀, V-16-03 (E. P. VanDuzee, C.A.S.).
 SHASTA CO.: 6 mi. West Burney, ♀, VII-29-46 (C.I.S.).
 VENTURA CO.: Saticoy, ♀, VIII-10-27 (C.I.S.); ♀, VI-4-25 (C. T. Dodds, C.A.S.); 3♀, VIII-3-18-29-27 (T. Craig, C.A.S.).
 YOLO CO.: Davis, ♀, V-23-18 (W. Herms, C.I.S.).

Chrysops discalis Williston

Chrysops discalis Williston, 1880, Trans. Conn. Acad. Sci. 6:245. Cotypes, 4♀, Como, Wyo.
States recorded from: Alta., B.C., Calif., Colo., Idaho, Man., Mont., Neb., Nev., N.D., Ore., Sask., Utah, Wash., Wyo.
California records:
 DEL NORTE CO.: Crescent City, 2♂, V-5-37 (M. Cazier, C.A.S.).
 INYO CO.: Lone Pine, ♀, VI-6-37 (D. Little, C.I.S.); 9♀, 22♂, V-31-37; 1♀, 4♂, V-2-37; ♂, V-14-37; 3♀, 2♂, V-24-37, 4♀, V-18-37; 9♂, 3♀, VI-4-37 (E. C. VanDyke, C.A.S.). Owens Lake, ♂, VI-2-37 (B. E. White, C.I.S.); ♂, ♀, same data (N. Frazier, C.I.S.); ♂, ♀, same data (C.A.S.). Owens Lake, ♂, 1937 (D. Little, C.I.S.).
Olancha, 4♀, VI-3-17 (C. L. Fox, C.A.S.); 3♂, V-20-37 (E. C. VanDyke, C.A.S.).
 LASSEN CO.: Amedee, ♀, VII-4-47 (R. L. Usinger, C.I.S.).
 MERCED CO.: Los Banos, ♀, V-22-18 (E. P. VanDuzee, C.A.S.).
 MODOC CO.: Davis Creek, ♀, VII-16-22 (C. L. Fox, C.A.S.).
 MONO CO.: Benton, 2♀, VI-22-41 (W. M. Pearce, C.A.S.).

Chrysops excitans Walker

Chrysops excitans Walker, 1850, Dipt. Saund., 1:72. Type, ♀, Cape Breton.
States recorded from: N.F., N.S., Labrador, Ont., Que., Man., Sask., Alta., B.C., Me., Mass., N.H., N.Y., N.J., Mich., Wis., Minn., Ill., N.D., Colo., Wyo., Mont., Utah, Calif., Ore., Wash., Alas.
California records:
 PLUMAS CO.: Buck's Lake, ♀, VII-14-49 (W. Middlekauff, C.I.S.).
 SHASTA CO.: Lake Eiler, 3♀, VII-9-47 (C. Hanson, C.I.S.).
 SIERRA CO.: Gold Lake, 2♀, VII-15-49 (R. M. Bohart, U.C.D.); ♀, same data (C.I.S.); ♀, VII-21-21; 2♀, VII-14-21 (C. L. Fox, C.A.S.); ♀, VI-16-40 (M. Cazier, T. Aitken, C.A.S.).

Chrysops fulvaster Osten Sacken

Chrysops fulvaster Osten Sacken, 1877, West. Dipt., p. 221. Cotypes, 5♀, ♂ (lectotype, ♀, Denver, Colo.).
States recorded from: Sask., Alta., Minn., N.D., S.D., Neb., Kan., Okla., Mont., Wyo., Colo., N.M., Idaho, Utah, Ariz., Calif.
California records: No specimens seen.

Chrysops furcata Walker

Chrysops furcata Walker, 1848, List I. p. 199. Type, ♀, St. Martin's Falls, Albany River, Hudson's Bay, Can.
States recorded from: Labr., N.B., N.S., Que., Ont., Sask., Man., Alta., B.C., Yukon Terr., Alas., Mich., Wisc., Minn., S.D., N.D., Mont., Wyo., Colo., Utah, Idaho, Ore., Calif., Wash., Nev.
California records: No specimens seen.

Chrysops hirsuticallus Philip

Chrysops hirsuticallus Philip, 1941, Proc. Ent. Soc. Wash., 43:126. Type, ♀, Woodland, Calif.
States recorded from: Calif.
 BUTTE CO.: Chico, ♀, IV-25-46 (W. Middlekauff, C.I.S.).
 ELDORADO CO.: Strawberry, ♀, VI-7-33 (G. E. Bohart, U.C.D.).
 LAKE CO.: Blue Lakes, ♀, VI-1-38 (L. Phillips, C.A.S.).
 MERCED CO.: Dos Palos, ♀, IV-22-48 (H. T. Reynolds, C.I.S.); ♀, VI-15-48 (C. A. Hanson, C.I.S.).
 YOLO CO.: Davis, ♀, VI-1936 (M. Cazier, C.I.S., paratype); ♂, V-13-48 (R. M. Bohart, C.I.S.); ♂, V-13-48 (R. M. Bohart, U.C.D.); ♀, V-13-48 (R. M. Bohart, U.C.D.); ♀, V-19-36 (U.C.D., paratype); 15♀, 3♂, V-12-49 (A. T. McClay, U.C.D.); ♂, V-49 (N. Sanderson, U.C.D.); ♀, IV-24-36 (C.A.S., paratype); ♀, IV-21-36 (C.A.S., paratype); ♂, V-4-36 (C.A.S., paratype).

Chrysops mitis Osten Sacken

Chrysops mitis Osten Sacken, 1875, Mem. Bost. Soc. Nat. Hist., 2:374. Cotypes 9♀ (lectotype, ♀, Hudson's Bay, Canada).
States recorded from: Labr., Que., Ont., Man., Sask., Alta., B.C., Alas., Me., N.H., Vt., Mass., R.I., N.Y.
California records:
 ELDORADO CO.: Myer's Camp, ♀, VII-22-48 (H. E. Cott, C.I.S.).
 HUMBOLDT CO.: Orick, 2♀, VII-10-38 (E. C. VanDyke, C.A.S.).

Chrysops noctifera noctifera Osten Sacken¹⁰

Chrysops noctifera noctifera Osten Sacken, 1877, West. Dipt., p. 220. Cotypes, 4♀ (lectotype, ♀, Webber Lake, Calif.).
States recorded from: Calif., N.M., Ore.
California records:
 ALPINE CO.: Hope Valley, 20♀, VII-9-48 (J. W. MacSwain, C.I.S.); 9♀, VII-9-48 (P. D. Hurd, C.I.S.); 2♀, VII-18-48 (J. W. MacSwain, C.I.S.); 3♀, VII-18-48 (P. D. Hurd, C.I.S.); ♀, VII-12-48 (P. D. Hurd, C.I.S.).
 BUTTE CO.: Oroville, ♀, IV-29-38 (H. H. Keifer, C.A.S.).

¹⁰Chrysops sp. near sordidus Essig is a misidentification of noctifera O.S.

CALAVERAS CO.: Camp Wolfboro, ♀, VI-20-39 (C.I.S.).

ELDORADO CO.: China Flat, ♀, VI-28-48 (P. D. Hurd, C.I.S.). Pyramid R.S., 2♀, VII-12-48 (P. D. Hurd, C.I.S.). Glen Alpine Creek, Tahoe, 10♀, VII-1-14-1915 (E. P. VanDuzee, C.I.S.). Glen Alpine, 19♀, VI-29-29 (E. P. VanDuzee, C.A.S.). Upper Echo Lake, 7400' elev., 2♀, VII-22-27 (E. O. Essig, C.I.S.); 3♀, VI-5-26 (U.C.D.). Fallen Leaf Lake, 3♀, VII-31 (O. H. Sweazy, C.A.S.); ♀, VII-1-15 (E. C. VanDyke, C.A.S.); ♀, VII-4-34 (C. D. Duncan, S.J.C.).

LASSEN CO.: Susan R. Camp, 2♀, VII-10-49 (J. E. Gillaspay, C.I.S.). Bridge Cr. Camp, 2♀, VII-9-49 (J. W. MacSwain, C.I.S.).

MARIN CO.: Bear Valley, ♂, V-25-19 (C. L. Fox, C.A.S.).

MARIPOSA CO.: Yosemite Val., ♀, VI-5 (C.I.S.).

NEVADA CO.: Truckee, 4♀, VII-5-27 (E. P. VanDuzee, C.A.S.). Donner Pass, 2♀, VI-18-40 (M. Cazier, T. Aitken, C.A.S.).

PLUMAS CO.: Quincy, 4 mi. W., 5♀, VI-19-21-49 (P. D. Hurd, C.I.S.); 4♀, VI-19-21-49 (J. W. MacSwain, C.I.S.). Meadow Valley, 3500-4000' elev., ♀, VI-21-24; ♀, VI-4-24 (E. C. VanDyke, C.A.S.); 3♀, V-22-49 (P. D. Hurd, C.I.S.); ♀, same data (J. W. MacSwain, C.I.S.); 2♀, VI-24-49 (P. D. Hurd, C.I.S.); ♀, VI-25-49 (R. L. Sisson, C.I.S.); 2♀, same data (P. D. Hurd, C.I.S.); 2♀, same data (J. W. MacSwain, C.I.S.); 3♀, VI-30-49 (P. D. Hurd, C.I.S.); ♀, VII-10-49 (Claude Smith, C.I.S.); ♀, VI-7-24 (W. H. Nelson, C.I.S.). Bucks Lake, 2♀, VII-1-49 (P. D. Hurd); 2♀, VII-14-49 (P. D. Hurd, C.I.S.); ♀, VII-23-49 (R. L. Sisson, C.I.S.); 2♀, VII-14-49 (W. Middlekauff, C.I.S.).

Chrysops noctifera pertinax Williston

Chrysops noctifera pertinax Williston, 1887, Trans. Kans. Acad. Sci., 10:132. Cotypes 8♀ (lectotype, ♀, Wash. Terr.).

States recorded from: Ont., Alta., B.C., Mich., Mont., Wyo., Colo., Utah, Idaho, Wash., Ore., Calif., N.H.?

California records:

ALPINE CO.: Hop Valley, ♀, VII-9-48 (J. W. MacSwain, C.I.S.).

BUTTE CO.: Oroville, ♀, IV-29-38 (H. H. Keifer, C.A.S.).

HUMBOLDT CO.: Orick, ♀, VII-24-34 (E. C. VanDyke, C.A.S.); ♀, VII-10-37 (VanDyke, C.A.S.).

LASSEN CO.: Susan R. Camp, ♀, VII-10-49 (J. E. Gillaspay, C.I.S.).

MARIN CO.: Bear Valley, ♂, V-25-19 (C. L. Fox, C.A.S.).

PLUMAS CO.: Quincy, 4 mi. W., ♀, VI-30-49 (P. D. Hurd, C.I.S.); 2♀, VI-22-49 (P. D. Hurd, C.I.S.). Meadow Valley, 3500-4000' elev., ♀, (E. C. VanDyke, C.A.S.). Bucks Lake, ♀, VI-23-49 (Claude I. Smith, C.I.S.).

SHASTA CO.: Hat Creek, ♀, VI-4-41 (T. Monroe, C.I.S.).

SIERRA CO.: Yuba Pass, ♀, VI-17-40 (M. Cazier, T. Aitken, U.C.D.); 2♀, same data (C.A.S.).

Webber Lake, ♀, VI-17-40 (M. Cazier, T. Aitken,

C.A.S.). Gold Lake, 2♀, VII-15-49 (R. M. Bohart, U.C.D.); ♀, VI-16-40 (M. Cazier, T. Aitken, C.A.S.). Sierraville, 2♀, VI-16-40 (M. Cazier, T. Aitken, C.A.S.).

TRINITY CO.: Big Flat, Coffee Creek, ♀, VI-20-34 (T. G. H. Aitken, C.I.S.); ♀, VI-22-34 (E. C. VanDyke, C.A.S.). Carrville, 2400-2500' elev., ♀, VI-16-34 (E. C. VanDyke, C.A.S.); ♀, V-17-34 (G. E. Bohart, C.A.S.); 2♀, VI-8-34 (T. G. Aitken, C.A.S.). Scott Mt., ♀, VI-37 (I. McCracken, C.A.S.).

Chrysops pachycera pachycera Williston

Chrysops pachycera pachycera Williston, 1887, Trans. Kans. Acad. Sci., 10:134. Cotypes, 3 specimens, both sexes, Calif.

States recorded from: Calif., Nev., Utah, Ariz. California records:

SAN DIEGO CO.: Desert Edge, ♂, IV-15-15 (M. C. VanDuzee, C.A.S.).

Chrysops pachycera hungerfordi Brennan

Chrysops pachycera hungerfordi Brennan, 1935, Univ. Kans. Sci. Bull., 22:306. Type, ♀, Blue Spring, Eddy Co., N. Mex.

States recorded from: Ariz., *Calif., N.M., Tex.

California records:

*CONTRA COSTA CO.: Brentwood, ♂, (C.I.S.).

Chrysops pechumani Philip

Chrysops pechumani Philip, 1941, Proc. Ent. Soc. Wash., 43:128. Type, ♀, Niles, Alameda Co., Calif.

States recorded from: Calif.

California records:

MARIN CO.: Tamalpais, ♀, V-28-22 (C. L. Fox, C.A.S. paratype).

NAPA CO.: Conn Creek, ♀, IV-23-49 (W. Middlekauff, C.I.S.).

SAN LUIS OBISPO CO.: Pismo, ♂, IV-25-19 (E. P. VanDuzee, C.A.S., allotype).

SANTA CLARA CO.: Alum Rock State Park, ♂, IV-19-42 (C.I.S.).

SANTA CRUZ CO.: Big Basin, ♀, IV-19-41 (H. E. Cartani, Philip Philip coll.).

Chrysops proclivis proclivis Osten Sacken

Chrysops proclivis proclivis Osten Sacken, 1877, West. Dipt., p. 222. Cotypes 4♀ (Lectotype, Marin Co., California).

States recorded from: N.B., Que., Alta., Sask.?, Yukon Terr., B.C., Wash., Ore., Calif., Colo.?, Ariz.?

California records:

ELDORADO CO.: Fallen Leaf Lake, ♀, VIII-31 (O. H. Sweazy, C.A.S.).

HUMBOLDT CO.: Klamath, ♀, VII-14-35 (Jean Russell, C.I.S.).

MARIN CO.: Bear Valley, ♀, VI-6-15 (C.A.S.).

MONO CO.: Mammoth Lake, ♀, VII-25-33 (R. M. and G. E. Bohart, C.A.S.).

PLUMAS CO.: Keddie, ♀, VI-15-40 (M. Cazier, T. Aitken, C.I.S.); ♀, same data (U.C.D.); ♀,

VI-15-40 (M. Cazier, T. Aitken, C.A.S.). Meadow Valley, 4000-5000' elev., ♀, VI-30-24; ♀, VII-1-24; ♀, VII-4-24; ♀, VI-14-24 (E. C. VanDyke, C.A.S.). Quincy, 4 mi. W., 3♀, VI-22-49; ♀, VI-30-49 (P. D. Hurd, C.I.S.).
 SANTA CRUZ CO.: Santa Cruz Mts., 500' elev., ♀, no date (R. Coleman, C.I.S.).
 SONOMA CO.: ♀ (M. C. VanDuzee, C.A.S.).
 SHASTA CO.: Hat Creek, ♀, VI-16-48 (L. G. Smith, C.I.S.).
 TRINITY CO.: Big Flat, Coffee Creek, ♀, VI-21-34 (E. C. VanDyke, C.A.S.).
 TULARE CO.: Mineral King, 8000' elev., ♀, VII-7-42 (R. Bohart, U.C.D.).

Chrysops proclivis imfurcatus Philip

Chrysops proclivis imfurcatus Philip, 1935, Proc. Ent. Soc. Wash., 37:157. Type, ♀, Summer, Wash., Male unknown.
States recorded from: B.C., Calif., Ore., Wash.
California records:
 ALPINE CO.: Markleeville, 5500' elev., ♀, VI-25-30 (J. K. Ellsworth, U.C.D.).
 MARIN CO.: Mill Valley, ♀, VI-21-48 (H. H. Leech, C.A.S.).
 PLUMAS CO.: Quincy, 4 mi. S., 2♀, VI-22-24-49 (P. D. Hurd, C.I.S.); 1♀, VI-20-49 (J. W. MacSwain, C.I.S.).
 TULARE CO.: Giant Forest, ♀, VII-18-28 (C. L. Fox, C.A.S.).

Chrysops proclivis picea Philip

Chrysops proclivis picea Philip, 1935, Proc. Ent. Soc. Wash., 37:157. Type, ♀, Huntington Lake, Calif. Male Unknown.
States recorded from: Calif.
California records: no specimens seen.

Chrysops robusta Brennan

Chrysops robusta Brennan, 1935, Univ. Kans. Sci. Bull., 22:333. Type, ♀, Los Angeles, Calif.
States recorded from: Calif.
California records:
 VENTURA CO.: Oxnard, ♂, VII-2-47 (J. F. Hart, C.I.S.).

Chrysops surda Osten Sacken

Chrysops surda Osten Sacken, 1877, West. Dipt., p. 223. Cotypes, 4♀ (Lectotype, Webber Lake, Calif.)
States recorded from: B.C., Calif., Nev., Ore., Wash.
California records:
 ALPINE CO.: Markleeville, 5500' elev., ♀, VI-25-30 (Joe Ellsworth, C.I.S.). Hope Valley, ♀, VII-9-48 (J. W. MacSwain, C.I.S.).
 ELDORADO CO.: Snowline Camp, ♀, VI-27-48 (P. D. Hurd, C.I.S.). Lake Tahoe, ♀, VI-21-15 (Bilsing, C.I.S.). U. Echo Lake, 7400' elev., ♀, VII-22-27 (E. O. Essig, C.I.S.). Fallen Leaf Lake, 7♀, VI-26-15; 7♀, VII-16-15; 2♀, VII-1-15; ♀, VII-10-15 (E. C. VanDyke, C.A.S.). Strawberry Val., ♀, VIII-13-12 (E. C. VanDyke, C.A.S.).

FRESNO CO.: Huntington Lake, ♀, VI-21-40 (A. T. McClay, U.C.D.).
 LASSEN CO.: Blue Lake, ♀, VII-19,20-47 (C. A. Hanson, C.I.S.).
 MARIPOSA CO.: Yosemite Val., 2♀, VI-20-21; ♀, VI-7-21 (E. C. VanDyke, C.A.S.).
 MONO CO.: Mammoth, ♀, VII-22-36 (R. M. and G. E. Bohart, C.A.S.).
 PLUMAS CO.: 4 mi. W., Quincy, 6♀, VI-24-49; 3♀, VI-30-49; ♀, VI-20-49 (P. D. Hurd, C.I.S.); ♀, VII-6-49; ♀, VI-21-49; ♀, VI-25-49 (J. W. MacSwain, C.I.S.); 2♀, VI-22-49 (Claude I. Smith, C.I.S.). Meadow Valley, 4000-5000' elev., ♀, VI-30-24 (E. C. VanDyke, C.A.S.). Keddie, 4♀, VI-15-40 (M. Cazier, T. Aitken, C.A.S.). Bucks Lake, 2♀, VII-14-49 (W. Middlekauff, C.I.S.).
 SHASTA CO.: Cayton, ♀, VII-20-18; ♀, VII-12-18 (E. P. VanDuzee, C.A.S.).
 SIERRA CO.: Gold Lake, 3♀, VII-10-21; ♀, VII-17-21; 2♀, VII-11-21, ♀, VII-12-21 (C. L. Fox, C.A.S.).
 SISKIYOU CO.: Weed, ♀, VI-27-22 (J. Mail-laird, C.A.S.). Shasta Springs, ♀, VI-21-20 (C. L. Fox, C.A.S.).
 SONOMA CO.: Sobre Vista, ♀, VI-26-10 (J. A. Kusche, C.A.S.).
 TULARE CO.: Giant Forest, 2♀, VII-18-21-28 (C. L. Fox, C.A.S.). Mineral King, ♀, VIII-15-35 (G. E. Bohart, C.A.S.).

Chrysops virgulata Bellardi

Chrysops virgulata Bellardi, 1859, Saggio Ditter. Messico, I:71. Type, ♂, Cuautla, Mex.
States recorded from: Ariz., Calif., Mex., Tex.
California records: no specimens seen.

Chrysozona americana (Osten Sacken)

Haematopota americana Osten Sacken, 1875, Mem. Bost. Soc. Nat. Hist., 2:395. Cotypes "more than two dozen specimens" (Lectotype, ♀, Hudson's Bay Terr.).
States recorded from: Alas., B.C., Alta., Sask., Man., Ont., Minn., N.D., Mont., Ida., Wyo., Colo., Utah, N.M., Calif.
California records: no specimens seen.

Glaucops fratellus (Williston)

Tabanus fratellus Williston, 1887, Trans. Kan. Acad. Sci., 10:140. Cotypes, 2♀, Wash. Terr.
States recorded from: Alas., B.C., Alta., Wash., Ore., Idaho, Mont., *Calif.

California records:

*ELDORADO CO.: Upper Echo Lake, 7400' elev., 15♀, VII-25 to VIII-7, 1949 (W. W. Middlekauff, C.I.S.).

Atylotus incisuralis (Macquart)¹¹

Tabanus incisuralis Macquart, 1847, Dipt. exot. nouv. peu connus, Sup. II, p. 21 (Orig. mem., Lille, 1847, p. 21). Type, ♀, America.

¹¹Tabanus insuetus O.S. is a synonym of Atylotus incisuralis (Macquart) which has been recorded from California.

States recorded from: Alas., B.C., Alta., Sask., Mont., Idaho, Utah, Wyo., Colo., Calif., Ore., Wash.

California records:

ALPINE CO.: Hope Valley, ♀, VII-9-48 (C. D. MacNeill, C.I.S.); ♀, VII-18-48 (J. Abul-hab, C.I.S.); ♀, VII-9-48 (N. D. Waters, C.I.S.); ♂, VII-9-48 (J. Abul-hab, C.I.S.); ♂, VII-18-48 (P. D. Hurd, C.I.S.).

ELDORADO CO.: Angora Lake, Tahoe, ♀, VI-26-15 (C.I.S.). Echo Lake, ♀, VII-21-48 (P. D. Hurd, C.I.S.). Fallen Leaf Lake, ♀, VIII-1931 (O. H. Sweazy, C.A.S.).

FRESNO CO.: Huntington Lake, ♀, VII-11-19 (F. E. Blaisdell, C.A.S.).

INYO CO.: Bishop, ♀, VIII-3-32 (W. Herms, C.I.S.). Owens Lake, ♀, VI-2-37 (C.A.S.). Lone Pine, 2♂, V-2-37 (E. C. VanDyke, C.A.S.). Big Pine, ♀, VI-18-29 (E. P. VanDuzee, C.A.S.).

LASSEN CO.: Blue Lake, ♀, ♂, VII-19, 20-47 (C. A. Hanson, C.I.S.). Bridge Cr. Camp, ♀, VII-9-49 (E. G. Linsley, C.I.S.).

MODOC CO.: Eagleville, 3♂, VII-9-46 (P. D. Hurd, C.I.S.). Lower Lake, ♀, VI-28-39 (T. Aitken, C.A.S.).

MONO CO.: Mono Lake, ♀, VI-23-37 (J. H. Mitchell, C.I.S.). Coleville, ♂, V-28-39 (T. G. H. Aitken, C.I.S.). Benton, 4♂, 2♀, V-22-41 (T. Aitken, C.A.S.).

MARIPOSA CO.: Yosemite Val., ♀, VII-12-21 (VanDyke, C.A.S.).

PLUMAS CO.: Quincy 4 mi. W., 2♀, VII-9-49 (P. D. Hurd, C.I.S.). Keddle, ♀, VI-15-40 (M. Cazier, T. Aitken, C.A.S.).

SHASTA CO.: Lassen Pk., 7500' elev., 3♀, 2♂, VII-18-49 (J. W. MacSwain, C.I.S.).

SIERRA CO.: Sierraville, 3♀, VI-16-40 (M. Cazier, T. Aitken, C.I.S.); ♀, same data (U.C.D.); ♀, same data (C.A.S.).

SISKIYOU CO.: Etna, ♀, 1939 (F. I. Horn, C.A.S.).

TULARE CO.: Mineral King, ♀, VIII-5-35 (G. E. Bohart, C.A.S.).

TUOLUMNE CO.: Tilden Canyon, Yosemite Nat'l. Pk., ♂, VII-30-38 (C.I.S.). Delaney Cr., Yosemite Nat'l. Pk., ♂, VII-26-36 (W. T. McKean, C.I.S.). Tuolumne Meadows, ♂, VIII-1-15 (C. L. Fox, C.A.S.).

Hybomitra californica (Marten)

Tabanus californica Marten, 1882, Can. Ent., 14:210. Type, ♀, Calif.; destroyed.

States recorded from: B.C., Wash., Ore., Calif., Mont.(?).

California records:

MENDOCINO CO.: Ryan Creek, ♀, VI-8-38 (N. Hardman, C.A.S.).

SAN MATEO CO.: Menlo Park, ♀, IX-1944 (C. D. Duncan, S.J.C.).

SANTA CRUZ CO.: Santa Cruz, ♀, VII-19-41 (J. W. Tilden, C.I.S.); ♀, VII-20-41 (J. W. Tilden, S.J.C.).

Hybomitra captonis (Marten)

Tabanus captonis Marten, 1882, Can. Ent., 14:211.

Type, ♀, Calif., destroyed.

States recorded from: B.C., Wash., Ore., Idaho, Mont., Colo., Calif.

California records:

CONTRA COSTA CO.: Antioch, ♂, IX-2-38 (T. Aitken, C.A.S.).

DEL NORTE CO.: ♀, VII-15-24 (E. R. Leach, C.A.S.).

MADERA CO.: Upper Soda Springs, ♀, VII-40 (D. L. Dow, U.C.D.).

MENDOCINO CO.: 9 E. Mendocino, ♀, VII-16-41 (T. Aarons, T. Aarons coll.).

PLUMAS CO.: Quincy, 4 mi. W., ♀, VI-25-49 (P. D. Hurd, C.I.S.).

TRINITY CO.: Zenia, ♀, VI-20-35 (M. Cazier, C.A.S.).

Hybomitra haemaphora (Marten)

Tabanus haemaphorus Marten, 1882, Can. Ent.

14:210-211. Cotypes 2♀, Calif.; destroyed.

States recorded from: B.C., Man., Wash., Ore., Calif., Idaho, Mont., Wyo., Colo., Utah.

California records:

ELDORADO CO.: Upper Echo Lake, 7400' elev., ♀, VIII-3-48 (W. Middlekauff, C.I.S.).

MONO CO.: June Lake, ♀, VI-30-49 (H. E. Cott, Cott Coll.).

PLUMAS CO.: Quincy, 4 mi. W., ♀, VII-9-49 (P. D. Hurd, C.I.S.).

SIERRA CO.: Gold Lake, ♀, VII-15-49 (R. M. Bohart, U.C.D.). Sierraville, ♀, VI-16-40 (M. Cazier, T. Aitken, C.A.S.). Yuba Pass, 2♀, VI-17-40 (M. Cazier, T. Aitken, C.A.S.).

Hybomitra melanorhina (Bigot)

Tabanus melanorhinus Bigot, 1892, Mem. Soc.

Zool. France 5:642. Type, ♀, Wash. Terr.

States recorded from: B.C., Wash., Ore., Calif., Mont., Wyo., Colo., Utah.

California records:

ALPINE CO.: Hope Valley, ♀, VII-9-48 (C. D. MacNeill, C.I.S.).

ELDORADO CO.: Angora Lake, Tahoe, ♀, VII-4-15 (C.I.S.); ♀, VII-10-15 (C.I.S.); ♀, VII-11-15 (C.I.S.). Echo Lake, 7400' elev., ♀, VII-10-25 (E. O. Essig, C.I.S.). Fallen Leaf Lake, ♀, VII-23-15; ♀, VII-18-15; ♀, VII-22-15; 2♀, VII-14-15 (E. C. VanDyke, C.A.S.).

MODOC CO.: Davis Cr., ♀, VII-11-22 (C. L. Fox, C.A.S.).

PLUMAS CO.: Meadow Val., 3500-4000' elev., ♀, VI-21-24 (E. C. VanDyke, C.A.S.). Keddle, ♀, VI-15-40 (M. Cazier, T. Aitken, C.A.S.).

TRINITY CO.: Scott Mt., 5350' elev., ♀, VII-14-49 (A. T. McClay, U.C.D.).

Hybomitra opaca (Coquillett)

Tabanus opaca Coquillett, 1904, In Baker, Inv.

Pac., 1:21. Cotypes, ♂, ♀, Ormsby Co., Nev. (Lectotype, ♀.).

States recorded from: Alta., Mont., Wyo., Colo., Utah, Nev., Calif.

California records:

LASSEN CO.: Hallelujah Jct., ♀, VI-27-49 (J. W. MacSwain, C.I.S.).

MONO CO.: Mammoth, ♀, VII-13-40 (D. Dow, U.C.D.).

TUOLUMNE CO.: White Mt., Yosemite Nat'l. Pk., ♀, VII-24-36 (C.I.S.).

Hybomitra philipi (Stone)

Tabanus philipi Stone, 1938, U.S.D.A. Misc. Publ. No. 305, p. 133. Type, ♀, Seattle, Wash. Male unknown.

States recorded from: Wash., Calif.

California records: no specimens seen.

Hybomitra procyon (Osten Sacken)

Tabanus procyon Osten Sacken, 1877, West. Dipt., p. 127. Cotypes, 2♀, Sonoma Co., Calif.

States recorded from: Sask.?, B.C., Wash., Idaho, Mont., Wyo., Ore., Calif., N.Mex.?

California records:

ALAMEDA CO.: Sunol, ♀, IV-26-39 (M. Cazier, C.A.S.). Berkeley, ♀, IV-17-37 (G. E. and R. M. Bohart, C.A.S.); ♀, IV-12-32 (G. Heid, C.A.S.).

BUTTE CO.: Yankee Hill, ♀, III-20-28 (H. H. Keifer, C.A.S.).

CONTRA COSTA CO.: San Pablo Val., ♀, V-9-21 (C.I.S.). Redwood Canyon, ♀, IV-40 (E. Scott, U.C.D.).

ELDORADO CO.: Fairplay, ♀, IV-17-49 (Hawthorne, C.S.D.A.).

MARIN CO.: Cypress Ridge, ♀, IV-11-20 (S. B. Freeborn, C.I.S.); 2♀, IV-6-21 (E. C. VanDyke, C.A.S.); ♀, III-29-21 (C.I.S.); ♀, VI-4-21 (E. E. Wehr, C.I.S.). Mill Valley, ♀, III-47 (E. S. Ross, C.A.S.); ♀, IV-12-25 (M. C. VanDuzee, C.A.S.). Fairfax, ♀, III-24-27 (C.L. Fox, C.A.S.); ♀, IV-13-19 (E. P. VanDuzee, C.A.S.).

MARIPOSA CO.: Yosemite, ♀, V-24-38 (K. D. Synder, C.A.S.).

MENDOCINO CO.: Yorkville, ♀, V-8-35 (E. P. VanDuzee, C.A.S.).

MODOC CO.: Hackamore, ♂, VII-17-48 (L. G. Smith, C.I.S.).

NAPA CO.: Pope Val., ♀, IV-1-32 (E. C. Van Dyke, C.A.S.).

PLUMAS CO.: ♀, IV-17-15 (E. J. Branigan, C.S.D.A.).

SANTA CRUZ CO.: Ben Lomond, ♀, V-16-42 (S.J.C.).

SONOMA CO.: Sobre Vista, ♀, III-19-11 (J. A. Kusche, C.A.S.).

YOLO CO.: Davis, ♀, IV-15-40 (G. W. Bishop, U.C.D.).

Hybomitra rhombica (O. S.).

Tabanus rhombicus Osten Sacken, 1876, Mem. Bost. Soc. Nat. Hist., 2(pt. 4, no.4):472. Cotypes, 6♀, Colo.

States recorded from: B.C., Sask., Alta., Mont., S.D., Wyo., Colo., Ariz., Utah, Idaho, Ore.?, Wisc., Ill.?, *Calif.

California records:

*ALPINE CO.: Hope Valley, ♀, VII-9-48 (C. P. MacNeil, C.I.S.).

*ELDORADO CO.: Echo Lake, ♀, VII-27-27 (E. O. Essig, C.I.S.); ♀, VII-19-40 (S. B. Free-

born, C.I.S.); ♀, VII-18-48 (C.I.S.). Angora Lake, ♀, VI-27-11 (C.I.S.).

*KERN CO.: ♀, VII-20-12 (C.I.S.).

*LASSEN CO.: Martin Springs, 4♀, VII-10-22 (C.I.S.).

*MARIPOSA CO.: Yosemite National Park, ♀, VII-28-40 (E. G. Linsley, C.I.S.); 2♀, VII-9-46 (H. P. Chandler, T.O. Thatcher, C.I.S.). Yosemite Val., ♀, VII-12-21 (E. C. VanDyke, C.A.S.).

*PLUMAS CO.: Buck's Lake, ♀, VI-23-49 (P. D. Hurd, C.I.S.). Meadow Valley, 3500-4000' elev., ♀, VI-8-24 (E. C. VanDyke, C.A.S.).

*SIERRA CO.: Gold Lake, ♀, VII-15-49 (R. M. Bohart, U.C.D.).

*TRINITY CO.: Scott Mt., ♀, 5350' elev., VII-14-49 (A. T. McClay, U.C.D.). Big Flat, Coffee Cr., ♀, VI-21-34 (T. Aitken, C.A.S.).

*TULARE CO.: Mineral King, 8000' elev., ♀, VII-7-42 (R. Bohart, U.C.D.).

*TUOLUMNE CO.: Tioga Pass, ♀, VII-25-45 (C.I.S.). Tuolumne Meadows, 6♀, VII-16-49 (L. L. Jensen, C.I.S.).

*YOLO CO.: Davis, 3♀, VI-36 (C.A.S.).

Hybomitra sonomensis sonomensis (O. S.).

Tabanus sonomensis Osten Sacken, 1877, West. Dipt., p. 216. Cotypes, 11♀, Sonoma Co., Calif.

States recorded from: B.C., Alta., Sask., Alas., Mont., N.D., S.D., Wyo., Colo., Utah, Ida., Calif., Ore., Wash., Ariz., N. Mex.?

California records:

ALAMEDA CO.: Berkeley, ♀, V-15-41 (C. D. Michener, C.I.S.); ♀, VII-19-39 (B. White, C.A.S.); ♀, V-16-40 (T. Aitken, C.A.S.).

Oakland, ♀, IV-31 (E. S. Ross, C.A.S.).

DEL NORTE CO.: Crescent City, 4♀, VII-20-23 (C.I.S.).

HUMBOLDT CO.: Orick, ♀, VII-24-34 (E. C. VanDyke, C.A.S.).

INYO CO.: Bishop, ♀, VIII-3-32 (W. B. Herms, C.A.S.).

LAKE CO.: Middletown, ♀, V-12-40 (S.J.C.).

MADERA CO.: Mt. Lyell, ♀, VIII-8-35 (E. C. VanDyke, C.A.S.).

MARIN CO.: Mill Valley, ♀, V-30-26 (E. P. VanDuzee, C.A.S.). Bear Valley, 2♀, VI-26-22 (C.A.S.). Fairfax, ♀, V-20-11 (C.A.S.).

Inverness, 12♀, VI-11-16 (E. C. VanDyke, C.A.S.).

MARIPOSA CO.: Yosemite Val., 2♂, VII-12,16-21 (E. C. VanDyke, C.A.S.).

MENDOCINO CO.: 9 E. Mendocino, ♀, VII-16-41 (T. Aarons, T. Aarons Coll.).

MONO CO.: Mono Lake, 2♀, VI-17-17 (C. L. Fox, C.A.S.).

NAPA CO.: ♂, V-17-18 (E. R. Leach, C.A.S.). Mt. St. Helena, 2♀, VI-9-18 (E. P. VanDuzee, C.A.S.).

PLACER CO.: Lake Tahoe, ♀, VI-17-40 (M. Cazier, T. Aitken, U.C.D.).

PLUMAS CO.: ♀, VI-10-13 (F. W. Nunenmacher, C.A.S.). Meadow Valley, 3500-4000' elev., ♀, VI-21-24 (E. C. VanDyke, C.A.S.).

SAN FRANCISCO CO.: Presidio of San Francisco,

2♀, VI-1-43 (K. Frick, C.I.S.). San Francisco,
♀, V-14-23 (E. P. VanDuzee, C.A.S.).

SAN MATEO CO.: Pescadero, ♀, VI-12-47 (W. Middlekauff, C.I.S.).

SANTA CLARA CO.: Mt. View, ♀, V-16-22 (C.I.S.); ♀, V-30-41 (K. Frick, C.I.S.). Sunnyvale, ♀, V-12-40 (T. Aitken, C.A.S.). San Jose, ♂, VI-17-18 (C. D. Duncan, S.J.C.). Stevens Creek, ♀, VI-1-41 (T. Aarons, T. Aarons Coll.).

SIERRA CO.: Sierraville, ♀, VI-16-40 (M. Cazier, T. Aitken, C.A.S.).

SONOMA CO.: Sobre Vista, 5♀, ♂, IV-8-29-1910; ♀, VI-31-10 (J. A. Kusche, C.A.S.).

YOLO CO.: Knights Landing, ♀, VIII-18-40 (C.I.S.). Davis, ♀, V-49 (H. Sanderson, U.C.D.).

Hybomitra sonomensis phaenops (Osten Sacken)

Tabanus phaenops Osten Sacken, 1877, West. Dipt., p. 217. Cotypes, 4♀, Webber Lake, Sierra Co., Calif.

States recorded from: B.C., Wash., Ore., Idaho, Mont., Wyo., Utah, Calif.

California records:

ALPINE CO.: Hope Valley, ♀, VII-9-48 (C. D. MacNeill, C.I.S.); ♀, VII-9-48 (N. D. Waters, C.I.S.).

DEL NORTE CO.: Smith River, ♀, VI-16-48 (C.I.S.).

INYO CO.: Bishop, ♀, VIII-3-32 (W. B. Herms, C.I.S.).

LASSEN CO.: ♀, VI-2-13 (Nunenmacher, C.I.S.).

MARIN CO.: Mill Valley, 6♀, VI-1-25-48 (H. B. Leech, C.A.S.).

MODOC CO.: Cedarville, ♀, V-30-39 (Cazier, Downes, Aitken, C.I.S.); ♀, same data (U.C.D.). Eagleville, ♀, V-29-39 (P. C. Ting, C.A.S.).

MONO CO.: Walker River, ♀, VI-24-37 (C.I.S.). Coleville, ♀, IV-6-32 (C.I.S.). Mono Lake, ♀, VIII-4-32 (W. B. Herms, C.I.S.). Leavitt M., ♂, VI-24-27 (J. H. Mitchell, C.A.S.).

SANTA CLARA CO.: Mountain View, ♂, V-30-41 (K. Frick, C.I.S.).

SIERRA CO.: Sierraville, ♀, VI-16-40 (M. Cazier, T. Aitken, C.I.S.). ♂, ♀, same data (C.A.S.).

SOLANO CO.: Green Valley Falls Park, ♂, IV-27-41 (C. D. Michener, C.I.S.).

TUOLUMNE-MONO CO.: Tioga Pass, Saddleback Lake, ♀, VII-25-48 (C.I.S.).

YUBA CO.: Marysville, ♀, VII-4-36 (M. Cazier, C.A.S.).

Hybomitra tetrica tetrica (Marten)

Theriopectes tetrica Marten, 1883, Can. Ent., 15:111. Type, ♀, Mont. Destroyed.

States recorded from: Alta., Mont., Wyo., Colo., Utah, Nev., Calif.

California records:

MONO CO.: Mammoth, ♀, VII-9-33 (R. M. and G. E. Bohart, C.I.S.).

PLUMAS CO.: Quincy 4 mi. W., 4♀, VI-20-24-49 (P. D. Hurd, C.I.S.).

SHASTA CO.: Hat Creek, ♀, VI-4-41 (E. G. Linsley, C.I.S.); ♀, VI-1-39 (W. C. Reeves,

C.A.S.); ♀, same data (U.C.D.); ♀, VI-11-41 (P. D. Hurd, C.I.S.); ♀, VI-15-48 (L. G. Smith, C.I.S.).

Hybomitra tetrica hirtula (Bigot)

Theriopectes hirtulus Bigot, 1892, Mem. Soc. Zool. Fr., 5:641. Type, ♀, Wash. Terr.

States recorded from: B.C., Alta., Sask., Man., Ont., S.D., Mont., Idaho, Utah, Wyo., Colo., N.M., Nev., Calif., Ore., Wash., Ill.?

California records:

INYO CO.: ♀, VII-12-34 (G. E. Bohart, C.A.S.).

PLUMAS CO.: Quincy, 4 mi. W., ♀, VI-20-49 (P. D. Hurd, C.I.S.).

SHASTA CO.: Hat Creek, ♀, VI-1-39 (W. C. Reeves); ♀, VI-15-48 (L. G. Smith, C.I.S.).

Tabanus aegrotus Osten Sacken

Tabanus aegrotus Osten Sacken, 1877, West.

Dipt., p. 219. Type, ♀, Napa Co., Calif.

States recorded from: B.C., Wash., Idaho, Mont., Utah, Ore., Calif.

California records:

ELDORADO CO.: Snowline Camp, ♀, VI-29-48 (J. W. MacSwain, C.I.S.).

HUMBOLDT CO.: Prairie Creek, ♀, VIII-10-48 (W. W. Wirth, C.I.S.). Van Dusen R., ♀, VII-16-29 (VanDyke, C.A.S.). Korbel, ♀, VI-16-16 (F. E. Blaisdell, C.A.S.).

LASSEN CO.: Butte Lake, Lassen Nat'l. Park, ♂, IX-12-48 (C. D. MacNeill, C.I.S.).

PLACER CO.: Brockway, ♀, VII-41 (G. E. Bohart, U.C.D.).

PLUMAS CO.: Bucks Lake, ♀, VII-14-49 (P. D. Hurd, C.I.S.).

SANTA CRUZ CO.: Santa Cruz Mts., ♀, VI-13-22 (S. E. Flanders, C.I.S.).

SIERRA CO.: Goodyear Bar, ♀, VII-8-23 (E. H. Nast, C.A.S.).

SISKIYOU CO.: Mt. Bradley, ♀, VII-7-14 (C. L. Fox, C.A.S.). Shasta Springs, 2♀, VII-1914 (C. L. Fox, C.A.S.).

TRINITY CO.: Zenia, 2♀, VI-19-35 (H. J. Rayner, C.A.S.). Carrville, ♀, VI-24-34 (VanDyke, C.A.S.).

TULARE CO.: Mineral King, ♀, VII-31-35 (G. E. Bohart, U.C.D.).

Tabanus laticeps Hine

Tabanus laticeps Hine, 1904, Ohio Nat. 5:239.

Cotypes, unstated No. ♂ and ♀, Calif. and Wash.

States recorded from: Calif., N.M., Ore., Wash.

California records:

ALAMEDA CO.: Berkeley, ♂, V-19-31 (C.I.S.); ♂, IV-21-38 (T. G. Aitken, C.I.S.).

CONTRA COSTA CO.: Mt. Diablo 13♀, V-27-31 (E. P. VanDuzee, C.A.S.); ♀, VII-24-48 (J. J. Roland, C.I.S.). Richmond, ♀, VIII-16-48 (W. W. Wirth, C.I.S.).

INYO CO.: Big Pine, ♂, VI-19-29 (E. P. Van Duzee, C.A.S.). Bishop, ♀, VI-20-29 (VanDuzee, C.A.S.).

MARIN CO.: Mt. Tamalpais, ♀, VII-29-48, (C. D. MacNeil, C.I.S.); ♀, VI-20-09 (VanDyke, C.A.S.). Mill Val., 2♀, VI-21-48 (H. Leech, C.A.S.); ♀, VI-11-25 (E. P. VanDuzee, C.A.S.); 4♀, VI-15-24 (VanDuzee, C.A.S.). Fairfax, 3♀, VI-18-39 (VanDyke, C.A.S.).

MENDOCINO CO.: Willits, ♀, VI-9-32 (U.C.D.).

MODOC CO.: Lake City, ♀, VII-30-22 (C. L. Fox, C.A.S.).

MONO CO.: Benton, ♀, VII-9-42 (W. M. Pearce, C.A.S.).

SAN FRANCISCO CO.: San Francisco, ♀, VI-15-19 (C. L. Fox, C.A.S.).

SAN MATEO CO.: San Mateo, ♀, VII-1-11 (J. A. Kusche, C.A.S.). Pescadero, 2♀, VII-15-17 (Fox, C.A.S.). Redwood City, 2♀, VII-14-40 (E. S. Ross, C.A.S.); 2♀, VI-26-46 (E. S. Ross, C.A.S.). Searsville Lake, 2♀, VI-9-49 (T. Aarons, T. Aarons Coll.).

SANTA CLARA CO.: Stevens Res., 3♀, VII-27-48 (R. Fritz, C.I.S.). Loma Prieta, 2♀, VI-30-48 (C.I.S.). Palo Alto, ♀, VI-20-24; ♀, VII-19-24; ♀, VII-21-24; ♀, VI-31; ♀, VI-22-44 (C. D. Duncan, S.J.C.). Cupertino, ♀, VIII-20-24 (C. D. Duncan, S.J.C.). Steven's Creek, ♀, VIII-2-28 (C. D. Duncan, S.J.C.). San Jose, ♀, X-26-48 (C. D. Duncan, S.J.C.).

SANTA CRUZ CO.: Santa Cruz, 1♀, VI-24 to VII-21-41 (J. W. Tilden, S.J.C.).

SOLANO CO.: Vacaville, ♀, VIII-24-48 (A. T. McClay, U.C.D.).

YOLO CO.: Woodland, ♀, VIII-26-49 (W. Middlekauff, C.I.S.).

Tabanus lineola scutellaris Walker

Tabanus scutellaris Walker, 1850, Ins. Saund., Dipt., I:27. Type, ♀, N.A.
States recorded from: B.C., Alta., Sask., Man., Ont., Que., Mass., Conn., N.Y., N.J., Del., Pa., Md., D.C., W.Va., Ohio, Mich., Ind., Ill., Wis., Minn., Iowa, Kan., Neb., S.D., N.D., Mont., Wyo., Colo., Utah, Idaho, Nev., Calif., Ore., Wash.

California records:

IMPERIAL CO.: Meloland, ♀, VI-9-49 (R. v.d. Bosch, C.I.S.).

INYO CO.: Westgard Pass, ♂, VI-3-37 (N. W. Frazier, C.A.S.).

PLUMAS CO.: Quincy, 4 mi. W., ♀, VI-21-49 (P. D. Hurd, C.I.S.); ♀, VI-25-49 (J. W. MacSwain, C.I.S.).

TRINITY CO.: Carrville, 400-2500' elev., ♂, VI-9-34 (E. C. VanDyke, C.I.S.).

Tabanus monoensis Hine

Tabanus monoensis Hine, 1924, in Webb and Wells, U.S.D.A., Dept. Bull. 1218, p. 29. Type, ♀, Topaz, Mono Co., Calif.

States recorded from: Calif., Ore.

California records:

CONTRA COSTA CO.: Brentwood, ♂, VII-20-40 (C.I.S.).

LOS ANGELES CO.: Mts. near Claremont, ♀, no date (Baker, C.S.D.A.).

SIERRA CO.: Downieville, ♀, VIII-29-48 (E.

G. Linsley, C.I.S.).

TULARE CO.: Potwisha, Sequoia N. Pk., ♀, VII-1-41 (E. C. VanDyke, C.A.S.).

Tabanus productus Hine

Tabanus productus Hine, 1904, Ohio Nat. 5:242.

Cotypes. unstated no. ♂ and ♀, Lander, Wyo., 5000-7000' elev.

States recorded from: Mont., Wyo., Colo., Utah, Ore., Calif., N.M.

California records:

INYO CO.: Lone Pine, ♀, VI-9-37 (L. D. Phillips, C.I.S.); ♀, VI-7-37; ♀, VI-6-37; ♂, V-2-37; ♀, VI-10-37 (E. C. VanDyke, C.A.S.); ♀, V-13-37 (L. R. Gillogly, C.A.S.); ♀, V-29-37 (B. E. White, C.A.S.). Bishop, ♂, VII-5-34 (C.I.S.); 3♀, VII-5-34 (C.A.S.). Owens Lake, ♀, VI-2-37 (N. W. Frazier, C.A.S.).

SAN LUIS OBISPO CO.: Paso Robles, ♀, V-22-28 (L. S. Slevin, C.A.S.).

SIERRA CO.: Sierraville, 2♀, VI-16-40 (M. Cazier, T. Aitken, C.I.S.); 2♀, same data (U.C.D.); 3♀, same data (C.A.S.).

Tabanus punctifer Osten Sacken

Tabanus punctifer Osten Sacken, 1876, Mem.

Bost. Soc. Nat. Hist., 2:453. Cotypes unstated no. ♂ and ♀ (lectotype ♀, Utah.).

States recorded from: Wash., Ore., Ida., Mont., Wyo., Colo., Utah, Okla., Tex., Ariz., N.M., Nev., Calif., B.C., Santa Cruz Is., Mex.

California records:

ALAMEDA CO.: Alameda, ♂, VIII-15-35 (H. VanDuzee, C.A.S.). Berkeley, ♂, (VanDyke, C.A.S.). Mission San Jose, ♂, V-21-16 (C.A.S.). Miles Canyon, ♀, IX-2-16 (W. M. Giffard, C.A.S.). Oakland, ♂, VII-12-14 (VanDyke, C.A.S.). Pleasanton, ♀, VIII-14-33 (J. Bongberg, C.I.S.); ♂, VI-1-33 (A. E. Michelbacher, C.I.S.).

ALPINE CO.:

AMADOR CO.:

BUTTE CO.: Oroville, ♀, VI-1-21 (C.I.S.); ♀, V-11-21 (C.I.S.); ♂, VI-4-21 (C.I.S.). Chico, ♀, IX-31-20 (C.I.S.).

CALAVERAS CO.:

COLUSA CO.: Williams, 2♀, VII-7-48 (W. Middlekauff, C.I.S.).

CONTRA COSTA CO.: ♀, VII-3-1931 (C.I.S.); Antioch, ♀, IX-26-32 (C.I.S.); ♀, VII-27-41 (E. C. VanDyke, C.A.S.); ♂, IX-20-36 (E. C. VanDyke, C.A.S.). Brentwood, ♀, VII-30-40 (C.I.S.).

DEL NORTE CO.:

ELDORADO CO.:

FRESNO CO.: Firebaugh, ♀, VIII-12-47 (V. M. Stern, C.I.S.); 2♀, VII-5-47 (V. M. Stern, C.I.S.); ♀, VI-17-49 (Ray Smith, C.I.S.). Oxalis, ♀, VII-15-47 (V. M. Stern, C.I.S.). Chowchilla, ♀, IX-2-47 (R. Coleman, C.I.S.).

GLENN CO.: 4♀, 1938 (B. Holdenreid, C.A.S.).

HUMBOLDT CO.: Blocksburg, ♀, VI-10-35 (E. W. Baker).

IMPERIAL CO.: El Centro, ♀, X-5-23 (J. D. Gunder, C.A.S.); ♀, 2♂, IX-25-48; ♂, IX-13-48

- (R. Coleman, C.I.S.). Westmorland, ♀, IV-25-49 (L. W. Quate, C.I.S.); ♂, IV-6-49 (P. D. Hurd, C.I.S.).
- INYO CO.: Lone Pine, ♀, VI-14-37 (L. R. Gillogly, C.I.S.); 7♀, VI-16-37 (L. R. Gillogly, C.I.S.); ♀, VI-12-37 (C.I.S.); ♀, IV-23-37 (N. W. Frazier, C.I.S.); ♀, VI-5-37 (VanDyke, C.A.S.). Death Valley, Cow Creek, 2♀, VI-19-48 (C.I.S.); Death Valley, ♀, IV-26 (J. D. Gunder, C.A.S.); Bad Water, ♀, III-13-41 (T. Aitken, C.A.S.). Owen's Valley, ♀, V-20-37 (J. W. Johnson, C.I.S.). Olancha, 3 mi. S., ♀, VIII-6-48 (P. D. Hurd and J. W. MacSwain, C.I.S.). Owen's Lake, ♂, VI-2-37 (N. W. Frazier, C.I.S.); ♂, VI-2-37 (T. Aitken, C.A.S.). Little Lake, ♂, VI-7-29 (R. L. Usinger, C.A.S.).
- KERN CO.: McKittrick, ♂, V-3-41 (K. Frick, C.I.S.). Bakersfield, ♀, VII-17-38 (T. Aitken, C.A.S.).
- KINGS CO.:
- LAKE CO.:
- LASSEN CO.: Hallelujah Jct., ♀, VI-27-49 (J. W. MacSwain, C.I.S.); ♀, VII-13-49 (Claude I. Smith, C.I.S.).
- LOS ANGELES CO.: San Dimas, ♀, X-28-38 (K. Frick, C.I.S.). Whittier, ♂, XI-28-09 (G. R. Pilate, C.A.S.). Short Cut Canyon, N.W. Fork San Gabriel R., ♀, IX-11-11 (J. I. Carlson, C.A.S.).
- MADERA CO.:
- MARIN CO.: Bear Valley, ♀, VII-1914 (C. L. Fox, C.A.S.).
- MARIPOSA CO.:
- MENDOCINO CO.:
- MERCED CO.: Los Banos, 10 mi. E., 15♀, VIII-23-48 (C.I.S.). Los Banos, ♀, V-23-18 (E. P. VanDuzee, C.A.S.). Dos Palos, ♀, 2♂, VIII-7-48 (C. A. Hanson, C.I.S.); ♀, VIII-21-47 (V. M. Stern, C.I.S.). Dos Palos, 8 mi. S., ♂, VII-11-46 (R. Smith, C.I.S.). Panoche Hills, ♀, IV-29-22 (VanDyke, C.A.S.).
- MODOC CO.: Cedarville, 2 mi. S., ♂, VII-9-46 (P. D. Hurd, C.I.S.); ♂, V-30-39 (P. C. Ting, C.A.S.). Buck Creek, ♀, VII-22-22 (C. L. Fox, C.A.S.).
- MONO CO.: Hat Creek, ♀, VIII-1-36 (R. M. and G. E. Bohart, U.C.D.). Mono Lake, ♀, VI-24-37 (N. W. Frazier, C.A.S.).
- MONTEREY CO.: Salinas, ♀, VII-29-40 (Aitken, C.A.S.).
- NAPA CO.:
- NEVADA CO.:
- ORANGE CO.: Costa Mesa, ♀, VIII-15-39 (P. D. Hurd, C.I.S.). Newport Bay, ♀, IV-16-41 (P. D. Hurd, C.I.S.).
- PLACER CO.:
- PLUMAS CO.:
- RIVERSIDE CO.: Ripley, 7 mi. S., ♀, VII-10-46 (J. W. MacSwain, C.I.S.). Blythe, 7 mi. N., ♀, VII-23-46 (W. F. Barr, P. D. Hurd, C.I.S.); 2♀, VI-17-46 (C.I.S.); ♀, VI-15-47 (J. W. MacSwain, C.I.S.); 2♀, VI-24-45 (C.I.S.). Hemet, ♀, VII-24-46 (J. W. MacSwain, C.I.S.). Salton Sea, 2♀, VI-22-48 (A. T. McClay, U.C.D.). Soboba Spgs., ♂, 5-31-17 (VanDuzee, C.A.S.). Palm Springs, ♀, VI-25-41 (E. C. VanDyke, C.A.S.).
- SACRAMENTO CO.: Walnut Grove, ♂, IX-7-47 (C. D. MacNeill, C.I.S.).
- SAN BERNARDINO CO.:
- SAN DIEGO CO.: Barona Indian Res., ♀, V-12-43 (E. W. Clark, C.I.S.); San Diego, ♂, (F. E. Blaisdell, C.A.S.); San Diego, Desert Edge, ♀, IV-18-15 (M. C. VanDuzee, C.A.S.).
- SAN FRANCISCO CO.: San Francisco, ♀, VI-15-19 (C. L. Fox, C.A.S.).
- SAN JOAQUIN CO.:
- SAN LUIS OBISPO CO.:
- SAN MATEO CO.: San Mateo 2♂, VI-15-1911 (J. A. Kusche, C.A.S.).
- SANTA BARBARA CO.: Carpenteria, ♂, VI-3-34 (M. Cazler, C.I.S.); ♂, VI-5-34 (B. E. White, C.A.S.).
- SANTA CLARA CO.: San Antonio Valley, 2♂, VIII-12-48 (Ray Smith, C.I.S.).
- SANTA CRUZ CO.: Santa Cruz, 2♂, VII-1904 (C.A.S.); ♀, VI-14-09 (E. A. Dodge, C.A.S.); ♂, IX-23-24 (E. A. Dodge, C.A.S.).
- SHASTA CO.:
- SIERRA CO.:
- SISKIYOU CO.: Lava Beds Nat'l Mon., ♀, VIII-24-40 (T. Aitken, C.A.S.).
- SONOMA CO.: Petaluma, ♀, X-19-42 (K. Frick, C.I.S.). Santa Rosa, ♂, VI-15-42 (K. Frick, C.I.S.).
- STANISLAUS CO.:
- SUTTER CO.: ♀, VII-10-37 (D. Howell, C.A.S.).
- TEHAMA CO.: Vina, ♀, VI-7-20 (S. J. Freeborn, C.I.S.).
- TRINITY CO.: Carrville, ♀, 2400-2500' elev., V-23-34 (E. C. VanDyke, C.A.S.).
- TULARE CO.: Wood L., ♀, IV-28-47; ♀, VI-6-47; ♂, IV-30-47; ♂, IV-5-47; ♂, V-20-47 (N. W. Frazier, C.I.S.).
- TUOLUMNE CO.:
- VENTURA CO.: Saticoy, ♀, VI-18-27 (T. Craig, C.A.S.).
- YOLO CO.: Knight's Landing, ♀, IX-17-42 (P. Galindo, T. Kelley, C.I.S.). Clarksburg, ♀, V-20-31 (C.I.S.). Davis, ♂, V-1-40 (C.I.S.); ♂, VIII-9-46 (R. M. Bohart, U.C.D.); ♀, V-22-26 (U.C.D.); ♀, VIII-14-46 (R. M. Bohart, U.C.D.); ♂, VI-28 (F. Wymore, U.C.D.); ♀, V-15-26 (U.C.D.); ♀, IX-3-35 (B. E. White, C.A.S.).
- YUBA CO.:
- Tabanus stonei Philip
- Tabanus stonei Philip, 1941, Can. Ent., 73:144 Type, ♀, Bozeman, Mont.
- States recorded from: B.C., Alta., Wash., Ore., Idaho, Mont., Wyo., Colo., Utah, N.M.?, Calif.
- California records:
- MONO CO.: Benton, ♀, V-22-41 (W. M. Pearce, C.A.S.).
- Tabanus vittiger nipontucki Philip
- Tabanus vittiger nipontucki Philip, 1942, Psyche, 99:32. Type, ♂, Coachella, near Salton Sea, Calif.
- States recorded from: Calif., Ariz.
- California records:

RIVERSIDE CO.: Blythe, ♂, VIII-9-46 (W. F. Barr, C.I.S.); ♂, VIII-22-46 (P. D. Hurd, C.I.S.); ♀, VIII-28-46 (P. D. Hurd, C.I.S.); ♀, V-9-47 (E. G. Linsley, C.I.S.); ♀, V-21-47 (R. F. Smith, C.I.S.).

IMPERIAL CO.: Niland, 2♀, 2♂, IV-25-49 (L. W. Quate, C.I.S.). Blythe, ♂, VIII-21-46 (P.D. Hurd, C.A.S.); ♀, VIII-23-46 (W.F. Barr, C.A.S.).

Tabanus kesseli Philip

Tabanus kesseli Philip, 1950, Ann. Amer. Ent.

Soc. 43(1):117. Type, ♀, West Fork, Ravalli Co., Mont.

States recorded from: Calif., B. C., Idaho, Ore., Mont., Nev., Utah, Wash.

California records:

ELDORADO CO.: Pollock Pines, ♀, VII-14-48 (J. W. MacSwain, C.I.S.); ♀, VI-22-48 (O. E. Myers, C.I.S.). Chile Bar, ♀, VII-5-48 (W. E. Kelson, C.I.S.). Snowline Camp, ♂, VI-30-48 (W. E. Kelson, C.I.S.).

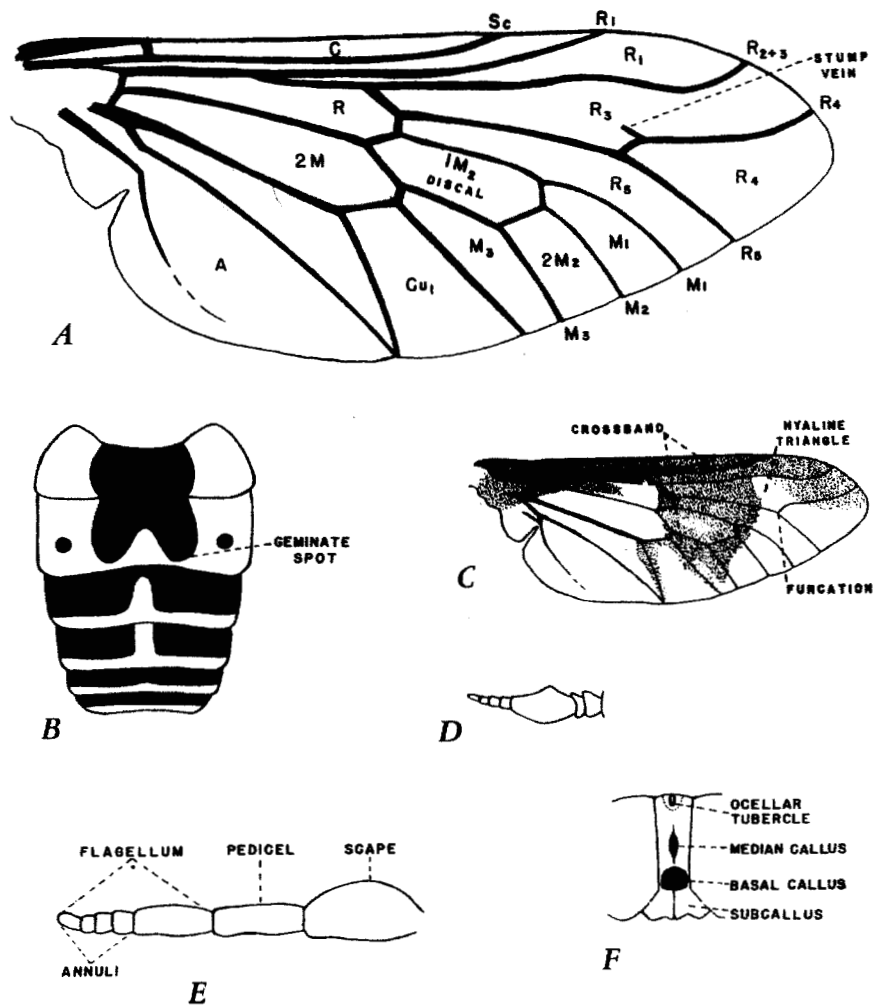
SANTA CLARA CO.: Loma Prieta, ♀, VI-30-48 (C.I.S.).

LITERATURE CITED

- Brennan, J. S.
1935. The Pangoninae of Nearctic America.
Univ. Kan. Sci. Bull. 22:249-401.
- Pechuman, L. L.
1938. Two new Nearctic Silvius. Can. Ent.
70:165-171.
- Philip, C. B.
1941. Notes on three western genera of
flies. (Diptera, Tabanidae).
Bull. Brook. Ent. Soc. 36(5):185-
199.
1947. A catalog of the blood-sucking fly
family Tabanidae of the Nearctic
region north of Mexico. Amer.
Mid. Nat., 37(2):257-324.
- Stone, Alan
1938. The horseflies of the subfamily
Tabaninae of the Nearctic region.
U.S.D.A. misc. pub. no. 305,
171 pp., June.

PLATE AND EXPLANATION

PLATE I



EXPLANATION OF PLATE I

- Fig. A.-Wing of Hybomitra sp., with terminology of wing venation.
- Fig. B.-Dorsal abdominal pattern of Chrysops surda O.S.
- Fig. C.-Wing picture of Chrysops coloradensis Bigot.
- Fig. D.-Antenna of typical Tabanus.
- Fig. E.-Antenna of Chrysops coquilletti Hine, illustrating incrassate (swollen)scape.
- Fig. F.-Front view of head of typical female Tabanus, showing the widely spaced eyes and frontal callosities.