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NEW SPECIES OF HEMIPTERA CHIEFLY FROM  
CALIFORNIA

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Of the 39 species described in this paper 26 were taken during my field work in southern California in May and June, 1917. The principal places visited were Coachella, a little north of the Salton Sea, having a depression of 76 feet below sea level; Palm Springs at the northwestern edge of the desert near the foot of the San Jacinto Mountains, with an elevation of about 425 feet above sea level; Soboba Springs in the San Jacinto Mountains near the town of San Jacinto, with an elevation of about 2,000 feet; Keen Camp in the San Jacinto Mountains at an elevation of 4,800 feet, with excursions on Mt. Tahquitz to 8,000 feet, and Colton, in San Bernardino County, with an elevation of about 800 feet. Unless otherwise stated, all localities are in California and all specimens from California were taken by myself.

1. *Trichopepla vandykei*, new species

Narrower and more clearly marked than *semivittata* with a shorter head. Length 7—8½ mm.

Head scarcely longer than its width across the eyes, less narrowed at tip than in *semivittata*, with the sides more abruptly arcuated there. Second antennal segment scarcely longer than the third, sometimes obviously shorter, in *semivittata* usually a little longer. Rostrum not surpassing the

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hind coxæ, in *semivittata* usually reaching on to the second ventral segment; both species having the basal segment longer than the bucculæ. Carinate margins of the pronotum regularly but feebly arcuated; in *semivittata* straight or feebly sinuated at the middle. Upper surface smoother with more regular and shallower punctures than in the allied species. Genital segment of the male short as in *semivittata*, but with its apical margin roundedly excavated, its basal angles scarcely notched. Claspers with the ventral angle produced outwardly in an acute rounded hook which almost conceals the rounded apex when viewed from below.

Color pale yellowish testaceous, marked with areas of black punctures as follows: a band on either margin of head before the eye superiorly and a broader one inferiorly; a broad vitta down either side of the pale median line, expanded so as to cover most of posterior disk of vertex, and four well defined rays on anterior half of pronotum. Basal half of scutellum polished black, crossed by three conspicuous pale calloused vittæ. Beneath with a fuscous or black cloud on side of pro- and meta-pleuræ, and some faint clouds on mesopleuræ. Venter pale, with indications of lateral vittæ in the female, the male claspers lineate with black. Punctures on pale portions of upper surface more or less infuscated. Membrane uniformly whitish in male, faintly fuliginous in female. Legs pale, immaculate except for a darkening on tips of tarsi. Hairy vestiture long, soft and pale as in *semivittata*.

Described from one male and two female examples taken in San Francisco, September 16, 1906, by Dr. Edwin C. Van Dyke, after whom the species is named. So far as known to me, this is the most clearly marked of all our species of *Trichopepla*. It may become more suffused under other conditions.

Holotype (No. 383), male, allotype (No. 384), female, and paratype, in collection of the California Academy of Sciences.

## 2. *Trichopepla californica*, new species

Aspect of *atricornis* but with a shorter head and a maculated connexivum. Length  $6\frac{1}{2}$  to 8 mm.

Head distinctly shorter than its width across the eyes; broadly rounded or truncated at apex, the sides parallel or nearly so for a space before the ante-ocular sinus. Third antennal segment not longer than second. Sides of pronotum almost rectilinear for a space at the middle, moderately expanded as in *semivittata*. Upper surface deeply punctured with black, the ray-like markings much obscured. Male genital segment trisinuately excavated, with its lateral angles strongly notched. Claspers obliquely produced at apex as in *semivittata*, with their ventral angle produced in an acute, incurved hook as in *vandykei*. Rostrum short, scarcely exceeding the intermediate coxæ.

Color as in *semivittata* but with the ray-like markings more obscured by large black punctures. The carinate pronotal margins seem always to be pale and usually the median line of the pronotum and the three calloused vittæ of the scutellum are conspicuous. Beneath the sternum is black and there is a black lateral vitta on the pleuræ and sides of the venter, the latter placed halfway to median line. Male with disk of venter mostly black. Legs testaceous-brown or more or less infuscated. Antennæ nearly black, connexivum about equally alternated with pale and black. Membrane quite deeply infuscated.



Described from four male and 15 female examples representing the following localities: Mt. Tallac, Calif., 8,500 feet, July 17, 1915, numbers taken running on the ground on a sloping alpine meadow, by Dr. E. C. Van Dyke and myself; Paradise Park, Mt. Rainier, Wash., 6,000 feet, July 14, 1906, Dr. E. C. Van Dyke; Prairie Hills, B. C., July, 1908, Selkirk Mountains, B. C., July, 1908, and Sisson, Calif., August 19, 1908, Dr. J. C. Bradley; Moscow, Idaho; Sierra Madre Mountains, Mexico, September.

This species may be recognized by the short, blunt head, the short rostrum, the obscured coloration, and the black vitta on either side of the venter.

Holotype (No. 385), male, and allotype (No. 386), female, from Mt. Tallac, in collection of the California Academy of Sciences. Paratypes in the collections of the California Academy of Sciences and in that of the author.

### 3. *Trichopepla aurora*, new species

Aspect of a large *semivittata* but with a somewhat shorter head and rounded, calloused pronotal margins. Length  $8\frac{1}{2}$  to 9 mm.

Head as long as its width across the eyes; narrowed from the antecular sinus, with rounded apex. Second antennal segment distinctly longer than third. Rostrum just passing the intermediate coxæ. Surface above coarsely, irregularly punctured with fuscous and black; connexivum alternated. Membrane infuscated. Genital segment of male broad, its apical margin shallowly, trisinuately excavated; claspers very broad, truncate, their apical margins rectilinear, not showing beyond the acutely produced ventral angle.

Color as in *semivittata*, well obscured by black punctures; ray-like markings of head and anterior lobe of pronotum distinct, those on base of scutellum mostly represented by three pale calloused spots. Calloused sides of the pronotum pale, not at all elevated but rounding over in conformity with the adjoining surface. Black alternations on the connexivum weakened by pale interpunctural spaces. Venter showing faint indications of six longitudinal darker vittæ. Antennæ mostly black. Legs pale, more or less obscured by minute blackish punctures.

Described from three males taken in El Dorado County, Calif., June 20, 1915, by F. W. Nunenmacher, one female taken by me at Ross Valley, Marin County, Calif., April 28, 1918, and one female from Gallatin County, Mont., taken June 22, 1900, at an elevation of 7,000 feet, by E. Koch. The



ecarinate sides of the pronotum and very broad male claspers will distinguish this species.

Holotype (No. 387), male, from El Dorado County, in collection of the California Academy of Sciences.

Allotype (No. 388), female, from Ross, Calif., in collection of the California Academy of Sciences.

Paratypes in both collections and in that of Mr. L. R. Reynolds.

#### 4. *Trichopepla grossa*, new species

Aspect of a *Carpocoris* but with the longer and more attenuated odoriferous canal of *Trichopepla*. More uniform in color than our other species of *Trichopepla*, the radiating vittæ conspicuous only on head and anterior field of pronotum. Length 9 to 10 mm.

Head nearly vertical, as long as its width across the eyes, narrowing anterior to the ante-ocular sinus; cheeks slightly surpassing the tylus. Second antennal segment longer than third. Rostrum attaining the intermediate coxæ. Carinate sides of pronotum calloused but scarcely reflexed, continuing the slope of the pronotal surface. Male genital segment feebly, trisinuately excavated at apex. Claspers broad, truncate, their ventral angle produced outwardly in a sharp bent tooth. Membrane fuliginous. Upper surface regularly deeply punctured.

Color yellowish testaceous, fusco-punctate, the punctures concolorous beneath and on apex of scutellum. Fuscous ray-like vittæ distinct anteriorly, fading out toward middle of pronotum. Antennæ black with the first and base of second segment pale. Legs pale or obscurely punctate. Connexivum black, broadly margined with pale. One male is almost entirely black with the apex of the scutellum and the connexivum pale, the legs strongly punctured with black and the pleuræ with lateral vittæ of black punctures.

Described from two males and two females. One black male from Julietta, Idaho, and two females from Moscow and Market Lake, Idaho, were received from Prof. J. M. Aldrich. The other male was taken at Castella, Calif., by Mr. J. A. Kusche, July, 1912.

Holotype (No. 389), male, from Castella, Calif., in collection of the California Academy of Sciences.

Allotype, female, from Moscow, Idaho, and paratypes in collection of the author.

The following table will distinguish the species of *Trichopepla* known to me:



- Sides of pronotum carinate, sometimes quite broadly reflexed..... 1  
 Sides of pronotum calloused, ecarinate, continuing the slope of the disk 4  
 1. Head longer than width across the eyes, apex narrower and more produced; sides approaching before the ante-ocular sinus; rostrum at least attaining apex of hind coxæ..... 2  
 -. Head not longer than width across the eyes, rounded at apex with the sides parallel for a space before the ante-ocular sinus; rostrum not surpassing the base of the hind coxæ..... 3  
 2. Head distinctly longer than width across the eyes; apex narrow, parabolic, but little arcuated; second antennal segment obviously longer than third; membrane infuscated; posterior disk of pronotum coarsely irregularly punctured, male genital segment trisinuately excavated; calloused lines on base of scutellum more or less broken and obscured ..... *semivittata* Say.  
 -. Head scarcely longer than width across the eyes; apex broadly rounded; second and third antennal segments subequal; membrane whitish hyaline; posterior disk of pronotum closely, finely punctured; male genital segment deeply, roundedly excavated; three calloused lines on base of scutellum very distinct and regular....  
 ..... *vandykei*, new species  
 3. Connexivum black, its margin quite broadly pale.... *atricornis* Stål.  
 -. Connexivum alternated with black at incisures.....  
 ..... *californica*, new species  
 4. Margin of connexivum broadly pale..... *grossa*, new species  
 -. Margin of connexivum alternated..... *aurora*, new species

### 5. *Carpocoris sulcatus*, new species

Allied to *remotus* but differing in the longer head and membrane, narrower scutellum and more maculated surface. Length 9 to 10 mm.

Head a little longer than width across the eyes, in *remotus* a little shorter; cheeks narrower, making the head look still longer. Sides of pronotum a little sinuated, in *remotus* feebly arcuated. Scutellum more narrowed beyond the frenulum with its apex more angulate, the base calloused and bevelled, leaving a deep groove behind the pronotal margin. Membrane surpassing abdomen for nearly one half its length beyond tip of corium. Rostrum attaining apex of hind coxæ, the basal segment scarcely reaching the apex of the bucculæ. Second antennal segment little if any longer than third. Genital segment of male deeply trisinate, the median lobe less deeply cleft than in *remotus*; claspers broad, truncate, with their ventral angle produced exteriorly; viewed from below these claspers are curved outward, oblique at tip, with the outer angle subacute.

Color pale yellowish testaceous with four black ray-like vittæ, more or less distinct, on head and anterior field of pronotum. Base of scutellum with a blackish cloud either side of a pale median vitta sometimes confined to the calloused depressed base. Punctures of upper surface sometimes darkened in places. Connexivum maculated in mature examples. Antennæ black, with basal segment and extreme base of second pale. Beneath and legs pale, immaculate, apex of tibiæ and tarsi somewhat infuscated.

Described from one male taken at Alpine, San Diego County, Calif., October 3, 1913, on grass under oak trees; one male taken by F. W. Nunenmacher in Mariposa County, Calif., June 15, 1914; one female taken by Dr. F. C. Clark, in Bear



Valley, Santa Cruz Mountains, in August, 1913, and one female taken by me near Redding, Calif., July 7, 1918. This species is a little larger than *remotus* and may be distinguished by the narrower and longer head, different relative lengths of the antennal segments, shorter basal segment of the rostrum, the black markings of the upper surface of the head, pronotum, scutellum and connexivum, and, especially, by the calloused and bevelled base of the scutellum. The colors are doubtless subject to variation but here there is none of the pink tint found on the corium of *remotus*. The male genital characters do not differ materially from those of *remotus* so far as can be seen without dissection.

Holotype, male from San Diego County, in collection of the author.

Allotype (No. 390), female from Bear Valley, and paratypes in collection of the California Academy of Sciences.

#### 6. *Brochymena sulcata*, new species

Closely allied to *4-pustulata* and *affinis* and somewhat intermediate between those species, but quite distinct in its male genital characters; cheeks more produced before the tylus; arolia narrower; male genital segment transversely sulcate, the claspers narrower, elliptical; length 12-15 mm.

Head as long as the pronotum on its median line; cheeks surpassing the tylus by their own width at that point, their inner margins at the sinus parallel or diverging, not approaching or overlapping as is usually the case in *4-pustulata*, their lateral tooth rectangular. Segments two to five of the antennæ subequal in length, the third sometimes a little longer, normally so in *4-pustulata*. Rostrum attaining the middle of the second ventral segment. Pronotum across the humeri a little more than twice broader than its median length; lateral margins before the sinus with four to six triangular flattish teeth that merge into the adjoining surface, the humeri with six to eight serrations or small teeth; in *4-pustulata* these lateral teeth are more terete and calloused and sometimes are curved backward. Exserted ostiolar canal tongue-shaped, narrowed at base, rather longer than the external diameter of the orificial tube; in *4-pustulata* lanceolate, broadest at base, and distinctly shorter. Male genital segment almost attaining the outer angle of the sixth ventral segment, its apical margin transversely sulcate, omitting the smoothly rounded median excavation; either side the sulcus clothed with long pale hairs; claspers elliptical ventrally, in *4-pustulata* broadly rounded. Other structural characters substantially as in *4-pustulata*.

Color above as in the allied species; beneath pale with the marginal alternations, slender edge of the segments, stigmata, a line behind them, and a spot on the middle of the sixth segment blackish. Femora fuscous with their base, an apical and a subapical spot pale, the latter often produced basally as a vitta. Tibiæ with a broad median pale annulus carrying a fuscous spot on the exterior face; the posterior rarely marked with a pale



basal spot exteriorly. Antennæ black with the incisures very slenderly pale. Rostrum pale with its median line and apex black.

Described from six male and twelve female examples taken as follows: San Diego, Calif., April, June, October and December, taken by myself; Los Angeles, Calif., April, M. C. Van Duzee; San Jacinto Mountains, 5000 ft., June, and Kemlo, Calif., June, Fordyce Grinnell; Cisco, Calif., July, C. von Geldern; Sobra Vista, Sonoma County, Calif., April, and south Sonoma County, Calif., June, J. A. Kusche; Martinez, Contra Costa County, Calif., J. C. Grundell; Santa Cruz Mountains, Chas. Fuchs; western San Joaquin County, Calif.; and Preston, Ariz., J. A. Kusche. I have heretofore determined this species as *4-pustulata* and it seems to represent that species west of the Rocky Mountains.

Holotype (No. 391), male, from San Diego, in collection of the California Academy of Sciences; allotype, female, from San Diego in collection of the author; paratypes in both collections.

#### 7. *Harmostes angustatus*, new species

Allied to *fraterculus* but with the antennæ longer with longer basal segment, the bucculæ lower and the colors paler. Length 7 to 8 mm.

Head as in the allied species, the clypeus broader and less elevated than in *reflexulus* or *fraterculus*; bucculæ lower than in *fraterculus*, scarcely surpassing anterior line of eyes, becoming almost evanescent posteriorly. Rostrum long, attaining base of second ventral segment; first segment reaching to within its own width of the base of the head. Antennæ long, slender; first segment clavate, surpassing the clypeus by one fourth its length; second as long as the head and equal to third, these segments unusually slender. Pronotum a little shorter than the head; sides irregularly arcuated, strongly carinated but not expanded or reflexed except for a short space at anterior angle, which is rounded with the usual prominent tooth; hind edge almost straight, disk with a distinct median carina which hardly attains the anterior margin. Scutellum distinctly tricarinate, its apex deeply impressed and upturned. Elytra parallel, the costa rectilinear from near its base; median areole of corium hyaline, the inner partly so. Venter deeply sulcate to fifth segment. Male claspers unusually slender, viewed from the side oblique at apex and much produced dorsally, median process acute or subacute.

Color pale testaceous-brown or tinged with green or yellow, more or less marked with fuscous, this color forming four obscure spots on hind margin of pronotum and clouding apical half of clavus and apex of corium; the nervures dotted with fuscous. Membrane whitish hyaline, obscurely dotted at times. Tergum deep black with a pale median vitta from base of the fourth segment, expanded posteriorly; apical segment with two black vittæ in male. Head, pronotum, scutellum, coriaceous portions of elytra, legs and often lower surface of body coarsely punctured with brown or rufous. A few individuals show the rosy tints on the clavus often found in the allied species.



Described from ten males and seven females. I have taken this species at Mussey's in San Diego County, Palm Springs, May 18 to 23, and Keen Camp in the San Jacinto Mountains, Calif., June 6, to 12, 1917, and have examples in my collection from El Paso, Texas, taken April 5, 1902; Alamogordo, N. Mex., taken June 9, 1902, and Bill Williams' Fork, Ariz., taken by Prof. F. H. Snow in August. At Palm Springs it was taken with its young on *Hymenoclea salsola* T. & G. The short bucculae and narrow pronotal margins will distinguish this species. These carinate margins are at times more or less crenulate but not strongly as in *affinis* and its allies.

Holotype (No. 392), male, and allotype (No. 393), female, from Palm Springs in collection of the California Academy of Sciences.

Paratypes in collection of the California Academy of Sciences and in that of the author.

The North American species known to me may be distinguished as follows:

- |  |                                 |   |
|--|---------------------------------|---|
| Lateral margins of pronotum distinctly serrated.....   | <i>affinis</i> Dall.            |   |
| Lateral margins of pronotum obscurely granulated or smooth.....  |                                 | 1 |
| 1. Lateral margins of pronotum carinated but not reflexed; bucculae attaining anterior margin of eyes.....                       | <i>angustatus</i> , new species |   |
| - Lateral margins of pronotum broadly expanded and reflexed.....   |                                 | 2 |
| 2. Color croceus or reddish; rostrum short; base of vertex without a groove .....  | <i>croceus</i> Gibson           |   |
| - Color more yellowish or testaceous; base of vertex with a median groove .....  |                                 | 3 |
| 3. Basal segment of antennae scarcely surpassing clypeus; bucculae not surpassing anterior line of eyes; membrane bivittate..... |                                 |   |
| .....  | <i>fraterculus</i> Say.         |   |
| - Basal segment of antennae much surpassing clypeus; bucculae attaining hind margin of eyes; membrane without vittae.....        | <i>reflexulus</i> Say.          |   |

#### 8. *Teleonemia vidua*, new species

Closely allied to *nigrina*, proportionately a little longer with more slender antennae; color a uniform dark fuscous with the head and basal segment of the antennae black. Length 4 mm.

Elongate, narrow; elytra nearly parallel, a little expanded at the middle. Vertex with two short porrect frontal spines, the anterior just above the line connecting the base of the antennae, the posterior continuing the superior line of the vertex. Antennae longer and more slender than in *nigrina*, clothed with very short hairs; segments one and two sub-equal; four scarcely as long as one and two together, fusiform with cinerous pubescence at apex; three nearly three times the length of four. Pronotum less convex than in *nigrina* with posterior scutellar portion longer, the anterior margin not elevated nor produced medially; carinae feeble; surface



rugose but scarcely punctured, becoming obscurely areolate posteriorly. Rostrum almost attaining hind edge of mesosternum, the rostral canal nearly parallel on the mesosternum, (metasternum covered in mounting). Discal area of corium coarsely and deeply punctured; subcostal area, narrow, obscurely biseriate; costal very narrow, whitish, the areoles longer than broad and distinguished by heavy veinlets. Membrane regularly distinctly areolate. Genital segment of female armed with a long pilose protuberance either side. These are not broadly divergent as in *nigrina* but diverge at first and are then bent backward so as to become parallel, their apices flattened and rounded. In *nigrina* these protuberances may be reduced to mere tubercles and the same may be true in the present species.

Color a nearly uniform fuscous becoming still darker beneath. Head and basal segment of antennæ black; costal areoles whitish; tibiæ pale, a little darker at base. Head, antennæ and legs somewhat polished.

Described from one female example taken at Keen Camp in the San Jacinto Mountains, June 8, 1917, at an elevation of nearly 6,000 feet. This is so evidently distinct from the related species it seems safe to describe it from a single example.

Holotype (No. 394), female, in collection of the California Academy of Sciences.

#### 9. *Teleonemia monile*, new species

Broader and more clearly marked than *nigrina*; subcostal area with two series of very distinct hyaline areolæ; antennæ short and stout. Length 4 mm.

Tubercles of the vertex small and inconspicuous; Antennæ short and thick as in *nigrina*; basal segment short-pilose, the third hardly more than twice the length of the fourth, the latter shorter than the basal two united. Pronotum nearly as in *nigrina*, the flattened anterior portion more angularly produced and distinctly areolate at the middle; posterior scutellar portion coarsely areolate; carinæ very distinct, subfoliaceous and areolate. Elytra considerably expanded at the middle, broader and truncate at apex; discal area very coarsely punctate, the punctures becoming subareolate exteriorly; subcostal area broad, distinctly biseriate, the areoles whitish hyaline; costal area rather broad, hyaline, the areoles elongated, separated by heavy veinlets. Membrane distinctly areolate. Rostrum about reaching hind margin of mesosternum; rostral canal broad on mesosternum and a little narrowing posteriorly. Female genital segment with a large rounded and flattened tubercle either side.

Color cinereous brown becoming lighter on the pronotum posteriorly and on the elytra; most of the elytral veinlets and the interstices between the punctures fuscous; linear costal area alternated with blackish and white, giving it a beaded appearance; beneath more fusco-ferruginous. Tibiæ pale on their apical two thirds. Second and third antennal segments quite strongly tinged with castaneous.

Described from one male and three female examples taken by Prof. H. F. Wickham at Lundy, Mono County, Calif., July 8-10, at an elevation of nearly 8000 feet. The broader form, short stout antennæ, distinctly areolate elytra, conspicuously



biseriate subcostal area and clearly marked moniliform costal area, which is continued about the apex of the elytra, will distinguish this species.

Holotype, male, and allotype, female, in collection of the author.

Paratypes in collection of the California Academy of Sciences and in that of the author.

Our California species of *Teleonemia* may be distinguished by the following key:

- |   |                             |
|---|-----------------------------|
| Subcostal area biseriate.....   | 1                           |
| Subcostal area uniseriate .....   | 2                           |
| 1. Subcostal area conspicuously biseriate; pronotal carinae conspicuous; large brown species .....  | <i>monile</i> , new species |
| - Subcostal area narrow, obscurely biseriate; pronotal carinae inconspicuous; smaller cinereous species.....  | <i>schwarzi</i> Drake.      |
| 2. Antennae stouter; third segment about twice the length of the fourth; costal area conspicuously areolate; color fuscous varied with cinereous .....                            | <i>nigrina</i> Champ.       |
| - Antennae more slender; third segment nearly three times the length of fourth; costal area very narrow, obscurely areolate; color brown, nearly uniform, with the head black.... | <i>vidua</i> , new species  |

#### 10. *Oncerometopus californicus*, new species

Larger and darker than *nigriclavus*; sanguineous, antennae, legs, callosities, clavus, inner field of corium, membrane and genital segment black; disk of pronotum more or less infuscated either side of the pale median line. Length to tip of membrane  $6\frac{1}{2}$  mm.

Vertex and tylus rather more convex than in *nigriclavus*. Antennae with the second segment distinctly longer than in *nigriclavus*, a little longer than the pronotum; third and fourth together a fourth shorter than second, in *nigriclavus* nearly a fourth longer. Pronotum proportionately longer, its length two fifths its basal width, in *nigriclavus* scarcely more than one half; sides nearly rectilinear, a little expanded at the humeral angles; column as long as the thickness of first antennal segment; callosities prominent, distinguished by a deep incision which is especially distinct behind the median bridge connecting them anteriorly. In *nigriclavus* this incised line is not conspicuous and behind the median bridge is represented by two impressed punctures; surface transversely rugose with scattering shallow punctures and an obvious obtuse median carina; hind margin almost truncate. Elytra nearly parallel, a little expanded at the middle, the embolium narrowly linear, distinct; surface polished, distinctly uniformly shagreened, in *nigriclavus* more opaque and but obscurely shagreened. Apex of abdomen in both sexes reaching midway between the tip of the cuneus and that of the membrane. Tibiae short-setose. Tarsi; basal segment scarcely expanded, second a little shorter than median length of first, in *nigriclavus* hardly half that length. Male genital characters rather obscure, the dextral hook lunate, a little narrowed posteriorly and lying against the excavated margin of the segment.



Color sanguineous, obscured on the vertex and pronotum; clypeus, antennæ, legs, callosities, clavus, inner field of corium, membrane and genital segments black; vertex, at least posteriorly, and disk of pronotum more or less infuscated, the collum, sides and median line remaining paler. Antennæ in the male testaceous with the first segment and narrow base of the second black; third and fourth in the female often paler.

Described from one male and ten female examples taken from the flowers of a bush sunflower growing along the road at Soboba Springs, near San Jacinto, Calif., June 1, 1917. Both this species and *nigriclavus* vary considerably in the extent of their dark markings but the characters given seem sufficient to separate them.

Holotype (No. 395), male, allotype (No. 396), female, and paratypes, in collection of the California Academy of Sciences.

### 11. *Neurocolpus simplex*, new species

Allied to *mexicanus*, proportionately shorter and broader than *nubilus* with basal segment of antennæ and hind femora more thickened; color yellowish, inclined to fulvous, the hairy vestiture white. Length  $6\frac{1}{2}$  to 7 mm.

Head about as in *nubilus*, the tumid vertex scarcely projecting beyond the line of the clypeus. Basal segment of antennæ clavate, shorter than in *nubilus* and thicker at apex than in either of our other species, its hairy vestiture silvery white, the hairs less flattened than in the allied forms; second segment almost twice the length of first, shaped as in *nubilus*, less clavate than in *mexicanus*; third and fourth together subequal to first, slender. Pronotum as in *nubilus*, its length one half its basal width, clothed with short matted scale-like hairs; collum not so strongly distinguished as in the allied species. Rostrum reaching to apex of the intermediate coxæ. Abdomen somewhat expanded, the connexivum surpassing the elytra in some examples.

Color obscure fulvous or honey-yellow, becoming clearer yellow on posterior disk of pronotum, apical lobe of scutellum, and base of elytra; the whole surface clothed with a white vestiture of scale-like hairs which show an inclination to form three lines on the vertex, to become somewhat matted on the pronotum, and are larger and more conspicuous on the legs. Membrane whitish hyaline with the nervures yellowish, becoming more or less infuscated at base. Sometimes there is a faint fuscous cloud on outer margin of membrane before its apex. One immature example has the apex of the tibiæ and of the embolium greenish.

Described from four females taken on the palo-verde, *Cercidium torreyanum*, among the foothills west of Coachella, Calif., May 16, 1917. This species is very distinct in its pale color, white vestiture and the form of the antennal segments.

Holotype (No. 397), female, and paratypes in the collection of the California Academy of Sciences.



12. *Phytocoris plenus*, new species

Very close to *inops* Uhl.; differing in the absence of a pale median annulus on second antennal segment, the more produced head and form of the male genitalia. Length 7 mm.

Head prominent, nearly vertical; viewed from the side extending below the eye for a space equal to about three fourths the greatest length of the eye; clypeus prominent, convex; gula oblique. In *inops* the head projects hardly more than one half the greatest length of the eye, the clypeus is less prominent and the gula is but slightly oblique. Rostrum long, in the male passing the apex of the fourth ventral segment, the basal segment broadly linear, attaining the middle of the anterior coxæ. Vertex viewed from above flat, obviously wider than the eyes; tumidly convex before; in *inops* not wider than the eyes and less convex before. Antennæ about as in *inops*, the first segment a little longer. Pronotal collum strongly differentiated; in *inops* but feebly so. Elytra with three polished areas, the basal but poorly distinguished; the apical conspicuous, resting on the base of the cuneus. Hind femora long, almost attaining the apex of the membrane. Apical margin of last ventral segment of male thickened, produced in a subacute angle; sinistral notch right-angled, terminating above in a blunt, blackish tooth which usually is somewhat longer than its width. In *inops* this tooth is longer, terete and much more slender. Dextral notch nearly as deep as the sinistral but more rounded at its fundus. In *inops* the ventral apex of this segment is less acute with both notches more rounded, the dextral shallower.

Color cinereous mottled with fuscous as in *inops* but with the markings more contrasted. Vertex distinctly striated anteriorly, its disk paler. Disk of pronotum paler; median line at base, sides and anterior angles infuscated; posterior submarginal line broken into dots, or nearly so. Antennæ fuscous, without pale annulations; the basal segment dotted with pale; the extreme base of segments two and three white. Scutellum distinctly varied with pale and fuscous, the anterior lobe fuscous with three pale marks, its apex conspicuously pale. Elytra rather evenly mottled with the costa dotted; corium with the three polished areas paler; cuneus pale within, its outer and inner margins varied with fuscous. Membrane evenly irrorate as in *inops*, its outer margin with two clear spots, the anterior at apex of the cuneus; nervures pale becoming fuscous at base. Legs irrorate with fuscous; coxæ and narrow base of femora white, the former bivittate with fuscous; tibiæ fuscous irrorate with white and marked with four white rings which are subequal to their interspaces, the basal on the hind pair obscure; tarsi fuscous with a pale annulus. Rostrum pale with its apex broadly fuscous. Sternum fuscous. Venter white, irrorate with fuscous, with a narrow pale vitta and a few orange dots on either side, the genital segments mostly fuscous. Behind each eye is a small tuberculate ivory mark and behind that is a larger one on the incised line of the collum.

Described from one male taken at Keen Camp in the San Jacinto Mountains, June 8, 1917; one male taken on the hills at Foster, San Diego County, April 11, 1914, and two males taken at Lakeside, San Diego County, Calif., May 5, 1913. I have seen no females I could certainly associate with these males.

This species is closely allied to *inops* but it is well distinguished by the characters given above. In the allied forms the



female has the vertex broader and the rostrum shorter than their males and the same may be true in this species. For ready recognition the banding of the tibiae will be found a convenient character: In *plenus* the anterior tibiae are narrowly black at either end with three dark rings between; in *inops* and related forms the apical ring is broad and there are but two between that and the narrow basal one. In *inops* the second antennal segment is fuscous with a pale median annulus. In the San Diego County males of *plenus* the basal half of the second antennal segment is paler.

Holotype (No. 398), male, from Keen Camp, in collection of the California Academy of Sciences.

Paratypes in the collection of the author.

### 13. *Phytocoris fraterculus*, new species

Allied to *inops*, averaging larger and darker with a longer head and wanting the median pale annulus on second antennal segment. Differs from *plenus* in the shorter pronotum and by the presence of a distinct pale annulus near the apex of the hind femora, and from both species by the characters of the male genitalia. Length 7 to 7½ mm.

Head produced below the eye for a space nearly equal to the length of the eye; clypeus prominent; gula oblique; cheeks prominent, rounded, not angularly produced as in *inops*. Vertex flattened, scarcely advanced to the line of the clypeus, not projecting before it as in *inops*. Rostrum attaining apex of second ventral segment; its first segment reaching to middle of anterior coxæ. Antennæ slender; first segment linear, hardly longer than the pronotum; second equal to the costal margin of corium; third about equal to first; fourth two-thirds the third; first armed with stiff hairs which are a little longer than the thickness of the segment. Pronotum short, its length one half its basal width; sides rectilinear; base slightly emarginate; collum distinct as in *plenus*. Elytra with three polished areas as in *plenus*. Legs long, about as in *plenus*; the hind femora reaching nearly or quite to apex of membrane, distinctly shorter than in *inops*. Sinistral margin of the genital segment with its superior angle unarmed, rounded; the sinistral hook long and curved as in *inops*, with a rounded notch at base; ventral aspect of the genital segment rounded or subacute at apex about as in *inops*. Surface clothed with close black pubescence and softer white deciduous hairs.

Color cinereous mottled with fuscous as in the related species, sometimes pale brownish and fuscous. Vertex distinctly striate; clypeus, loræ and cheeks brown, bordered with pale; hind margin of the eye and usually a median spot on base of vertex whitish. Pronotum brown or fuscous becoming pale about the callosities and blacker toward the margins; the hind edge narrowly white behind a blackish vitta which may become broken into six lobes or spots. Scutellum brown with basal angles and a geminate median



line fuscous and the sagitate apex white. Elytra cinereous or brown with a darker, usually irrorate, area along the claval suture and on the radial vein and costa; apical polished area angulate, pale, and invading the base of the cuneus; margins of the cuneus variegated with black and pale. Membrane about as in *plenus*; white, rather closely and evenly irrorate with fuscous but shading darker toward its base; margin darker, alternated with two white spots beyond tip of cuneus; nervures brownish, the radial sometimes blackish. Beneath fuscous-brown; coxæ and sometimes disk of venter pale. Legs fuscous, irrorate with whitish and sometimes pale at base; hind femora with an oblique pale subapical vitta and in the female a pale ray from the base to near the middle; tibiæ showing three, more or less distinct, pale bands, one, before the middle of the hind pair, unusually distinct. Antennæ fuscous; basal segment irrorate with pale; extreme base of second and third segments white, the second without a pale median annulus.

Described from three male and eleven female examples taken at the following localities: Yosemite, Calif., June 16, 1916; Fallen Leaf Lake, Calif., August 21, 1916, 6300 feet; Tallac, Calif., August 22, 1916, 6000 ft., Soda Springs, Nevada County, Calif., 6800 ft., August 24, 1916; all taken by Mr. Walter M. Giffard; Bright Angel Camp, Ariz., 6900 ft., H. F. Wickham, and Pine Hill in the Cuyamaca Mountains, San Diego County, Calif., Oct. 19, 1913, 4300 ft., taken by myself.

Holotype (No. 399), male, and allotype (No. 400), female, from Yosemite, in collection of the California Academy of Sciences.

Paratypes in collection of Mr. Walter M. Giffard and in that of the author.

#### 14. *Phytocoris hirtus*, new species

Aspect of *plenus* but readily distinguished from that and other allied forms in having the upper surface clothed with unusually long hairs, especially upon the legs. Length  $8\frac{1}{2}$  mm.

Head oblique, produced before the eye for a distance about equal to the greatest length of the eye; cheeks tumidly convex but somewhat less so than in *inops*; Vertex convex and swollen along the line of the clypeus much as in *inops*. Rostrum reaching well on to the third ventral segment. Antennæ slender; first segment as long as basal width of pronotum, slightly thickened basally; second segment nearly twice the length of first; third and fourth together as long as second; first sparsely clothed with long pale hairs which are at least twice as long as the thickness of the segment. Pronotum long and well narrowed anteriorly as in *plenus*, the sides a little convex; hind edge a little emarginate; collum distinct; callosities small and inconspicuous. Elytra long with the costa slightly arcuated; venter reaching to tip of cuneus. Upper surface and head clothed with nearly erect brown hairs which are almost as long as the thickness of the hind tibiæ and are interspersed with short scale-like deciduous hairs. Legs clothed with soft pale hairs as long as the thickness of the anterior femora.



Color about is in *plenus*; pale brownish or cinereous varied with fuscous; disk of clypeus, loræ and cheeks and two vittæ behind the eyes which are continued across the inferior aspect of the pronotum, fuscous; frontal striæ distinct. First segment of antennæ whitish, with a series of dots and the broad apex fuscous; second segment pale brown, broadly white at base becoming fuscous at apex and next the pale basal annulus; third and fourth segments fuscous, the third narrowly pale at base. Pronotum becoming paler anteriorly and almost black before the narrow white posterior margin. Scutellum variegated with a pale apex. Elytra with the three polished areas paler, the posterior whitish and extended so as to cover basal half of cuneus; apex of corium and cuneus blackish. Membrane irregularly irrorate, the areoles and apex darker. Beneath pale or yellowish, the pleural pieces mostly infuscated. Sides of venter mottled with fuscous with indications of a paler longitudinal vitta below the stigmata. Legs pale, the femora irrorate with brown, especially above; the tibiæ with four fuscous annuli, more or less distinct.

Described from two females from southern California, one taken by Mr. Fordyce Grinnell at Pasadena, the other taken by me at North Island, Coronado, San Diego, June 30, 1913. The large size and hairy vestiture of this species will warrant its description from females only.

Holotype (No. 401), female, from Pasadena, in collection of the California Academy of Sciences.

Paratype in author's collection.

The following key will help to distinguish the six grey or fuscous mottled species having finely irrorate membranes, which have been reported from California:

- |  |                                  |   |
|--|----------------------------------|---|
| Legs clothed with whitish hairs which are longer than the thickness of the tibiæ.....  | <i>hirtus</i> , new species      |   |
| Legs smooth or with minute pubescence only.....  |                                  | 1 |
| 1. Dimorphus; male linear, uniformly grey, irrorate; female brachypterous with a fuscous ray on the clavus and wedge-shaped mark on the corium posteriorly.....                                | <i>canescens</i> Reut.           |   |
| - Sexes similar; above irregularly mottled.....  |                                  | 2 |
| 2. Head short, vertical, produced below the eye for a space equal to about one half the length of the eye.....   |                                  | 3 |
| - Head long, oblique, produced below the eye for a space nearly equal to the length of the eye .....   |                                  | 4 |
| 3. Smaller and pale; dextral margin of the male genital segment without a tooth superiorly .....   | <i>heidemanni</i> Reut.          |   |
| - Larger and darker; dextral margin of the male genital segment produced in a terete tooth superiorly .....  | <i>inops</i> Uhl.                |   |
| 4. Hind femora without an oblique pale annulus; second antennal segment one half longer than first; dextral margin of male genital segment produced in a broad flattened tooth superiorly..... | <i>plenus</i> , new species.     |   |
| - Hind femora with an oblique subapical pale annulus; second antennal segment twice the length of first; dextral margin of male genital segment without a tooth at superior angle.....         | <i>fraterculus</i> , new species |   |



15. *Phytocoris geniculatus*, new species

Pale greenish, sprinkled and varied with whitish; apex of cuneus and the hind femora tinged with fulvous, the latter armed at apex with two short black tubercles. Length 5 mm.

Head moderately produced, nearly vertical before; vertex and clypeus strongly convex leaving a deep suture between them, the vertex about one half wider than an eye in male, nearly twice as wide in female; frontal striæ conspicuous; cheeks prominent but scarcely angled before. Rostrum attaining third ventral segment; its first segment reaching the base of the head in male, a little longer in female. Antennæ longer than the entire body; first segment as long as head and pronotum together, linear, as thick as two-thirds the superior width of an eye, sparsely clothed with fine pale pubescence with a few longer stiff hairs intermixed; second segment nearly twice the length of first; third three-fourths the length of second; fourth one half of third. Pronotum strongly narrowed before, its length one half the basal width; sides straight; collum distinct; callosities large, obscure. Elytra somewhat polished all over, with two large areas more distinctly so. Legs long, the hind femora surpassing the membrane and much flattened. Apex of the male genital segment subacute; the sinistral notch deep and acutely angled, the margin rounded and unarmed above; sinistral hook short, crescentic, blunt at apex, not nearly reaching to the apex of the segment.

Color pale greenish or yellowish, marbled with whitish, the two polished areas of the elytra still whiter; apical half of cuneus and the hind femora tinged with fulvous; hind femora armed with a small deep-black tubercle on either side at apex. Whole upper surface sparsely clothed with a deciduous white pubescence with scattering longer fuscous hairs; the extreme tip of clavus with a minute tuft of black hairs, and in perfect examples there is another at the inner margin of the cuneus and probably a third at its inner basal angle. Legs and antennæ obscurely varied with pale fulvous-brown and whitish; the apex of the second and third antennal segments often infuscated as is the apical half of the fourth. Beneath, with coxæ and base of femora paler, the venter marbled more or less with darker. Membrane white, more or less irrorate with minute brown points and sometimes with a black point at the middle of the outer margin, the nervures yellowish.

Described from 32 examples, representing both sexes, taken at Coachella and Palm Springs, Calif., May 14th to 19th, 1917. At Coachella they were less mature and were found feeding on a small-leaved *Atriplex*. This species may be distinguished by its pale greenish white mottled aspect with a fulvous tinge to the cuneus and hind femora and by the two black tubercles at apex of these femora.

Holotype (No. 402), male, and allotype (No. 403), female, from Palm Springs, and paratypes in collection of the California Academy of Sciences.



### 16. *Phytocoris consors*, new species

Closely allied to *geniculatus*; differs principally in wanting the fulvous color on the cuneus and femora and the black tubercles on the apex of the hind femora and in having the basal segment of the antennæ distinctly white-pilose; pale dull greenish, evenly, finely marmorated with pale. Length 5 mm.

In its structural characters this species is almost identical with *geniculatus* but there are certain differences. The first antennal segment is much more thickly set with long stiff white hairs; the elytra do not show the contrasting polished areas which are quite evident in its ally and the tubercles at the apex of the hind femora are concolorous or barely tipped with black. the male genital characters seem scarcely to differ.

Here the color is the same greenish white found in *geniculatus* but the whole upper surface is quite uniformly marmorated with pale dull green. The pale polished areas found in the allied form and the fulvous tint so constant there are absent here. The antennæ have the same mottled aspect but none of the specimens before me show any trace of the fuscous apex on the second and third segments found in the other form. The membrane here is white with more or less of the fuscous dotting found in *geniculatus* and the whole upper surface is dotted with soft white hairs as in that species, but here I can detect in none of the specimens before me, all of which seem to be perfect, the longer stiff brown hairs present in the allied form.

Described from two male and five female specimens taken at Coachella and Palm Springs, Calif., May 14-21, 1917. Like the preceding they were found on the whitish vegetation growing on the floor of the desert.

Holotype (No. 404), male, and allotype (No. 405), female, and paratypes in collection of the California Academy of Sciences.

### 17. *Phytocoris ventralis*, new species

Nearest *geniculatus*; small, short and broad with much the aspect of a *Psallus*. White; elytra sparsely sprinkled with black; broad apex of the second antennal segment, knees, and a vitta on either side of the venter black. Length  $4\frac{1}{2}$  mm.

Head vertical, produced below the eye for a distance nearly equal to the length of the eye in the female, for about half this length in the male. Rostrum long, reaching to middle of venter in the female and to the sixth ventral segment in the male. Antennæ as long as the entire body in the male, a little shorter in the female; first segment short, stout, as long as the pronotum, clothed with soft white hairs which are nearly as long as the thickness of the segment; second segment as long as the corium; third two-thirds the length of second; fourth about equal to first. Pronotum short, rather steeply declinate; hind edge slightly emarginate; callosities large, not conspicuous; collum narrow, poorly distinguished. Elytra nearly parallel, opaque white with a subhyaline, more polished area exteriorly at



base and at apex. Abdomen reaching to tip of cuneus in the female. Legs short for this genus. Dextral male clasper very small; sinistral broad and angled superiorly at base, curved and lying against ventral margin of genital segment, the apex of which it attains, its apex subacute.

Color testaceous-white, clear white on the pronotum and elytra; upper surface clothed with short scale-like deciduous white hairs intermixed with which are a few strongly clavate black ones, imparting a sprinkled effect; apex of corium with a small fuscous cloud; apical margins of cuneus narrowly infuscated. Callosities testaceous like the head. Membrane minutely and irregularly irrorate with pale brown. Antennæ white; extreme tip of first segment fuscous; apex of second black for a space equal to one half the length of the first segment; third and fourth black; base of third narrowly white. Mesothorax beneath black with pale median and lateral vittæ. Venter with a broad deep-black vitta on either side attaining the genital segment in the female. Legs white, apex of femora, and extreme base of tibiæ more or less broadly black. A few small points on the tibiæ and the base and apex of the tarsi brown. Tibiæ clothed with soft white hairs and a few stiff brown bristles.

Described from one male and two female examples taken on palo-verde growing among the foothills seven miles west of Coachella, Calif., May 16, 1917. The male is immature with the black ventral vittæ scarcely indicated. The small eyes, oblong form, white color, black ventral vittæ and the presence of clavate black hairs above will distinguish this well-marked species.

Holotype (No. 406), female, allotype (No. 407), male, and paratype in collection of the California Academy of Sciences.

#### 18. *Pallacocoris candidus*, new species

Aspect of a *Trigonotylus* nearly; creamy white throughout and clothed with a soft white pubescence, in fresh examples showing a median line of white hairs on the vertex, pronotum and scutellum; antennæ very long. Length 6 mm.

Head porrect; vertex nearly horizontal, viewed from above rounded before and projecting for a third of its length before the eyes; clypeus vertical, strongly convex, its basal suture deep, on a line with the insertion of the antennæ; cheeks prominent, cylindrical; gula horizontal; bucculæ low. Antennæ very long, one fourth longer than the entire body; first segment stout, linear, as long as the head and pronotum, a little thicker near its base, clothed above with soft appressed white hairs which become shorter at apex, and beneath with matted hairs longer than the thickness of the segment; second segment a little longer than the corium; third and fourth nearly equal to second. Rostrum reaching to near the middle of the venter, the first segment but little surpassing the base of the head. Pronotum trapezoidal, nearly horizontal, but little narrowed anteriorly; sides straight, carinated; collum broad, depressed, but poorly distinguished; callosities small, obscure, set far apart; hind margin truncate. Scutellum rather long; its basal field a little expanded. Elytra long, narrow, parallel. Legs long, hind femora surpassing the abdomen, narrowing from near base



to apex; hind tibiae very slender, as long as the entire elytra. Basal segment of the tarsi longer than the second and equal to the third. Male genital characters inconspicuous, the dextral notch deep, the dextral clasper short, scarcely produced.

Color uniformly creamy white, sometimes tinged with green on the scutellum; antennae infuscated at apex; apical margin of the elytra with three tufts of ferruginous hairs, one at tip of clavus and two on the inner margin of cuneus. In fully colored examples the membrane is tinged with ferruginous at apex and marked with two darker spots on the margin. Apex of tarsi a little darker. Rostrum black at apex. Base of the female oviduct infuscated.

Described from thirteen examples representing both sexes taken at Coachella and Palm Springs, Calif., May 16 to 23, 1917. This genus is certainly close to *Miridius* Reuter and is recognized here only in deference to Reuter's views. The species seems quite distinct from *suavis*. Generic characters are included in the above description for convenience.

Holotype (No. 408), male, and allotype (No. 409), female, and paratypes in collection of the California Academy of Sciences.

#### 19. *Lygus abroniae*, new species

Closely related to *rubicundus* Fall. as distinguished by Mr. Knight in his review of this genus. Larger, face clothed with long decumbent pale hairs; color bronze-grey to deep black; second antennal segment, tibiae and tarsi pale except at base and apex, the femora always (?) black in mature examples; extreme tip of scutellum pale; membrane bivittate with fuscous. Length 5-6 mm.

Head more oblique than in *rubicundus*, moderately convex, distinctly punctate; basal carina and an oblique line from the hind angle of the eye half way to the middle, smooth; clothed with moderately long appressed grey hairs which converge obliquely to the median line; frontal striae obvious but not conspicuous; clypeus prominent, smooth; bucculae high, reaching to the basal third of the gula. Rostrum attaining middle of hind coxae. Antennae short as in *rubicundus*; first segment surpassing the clypeus by one half its length; second hardly three times the length of first, gradually thickened apically; third slender, sub-equal to first; fourth slender, about three fourths the length of third. Pronotum much as in *plagiatus*, more convex and sloping anteriorly than in *rubicundus*; closely evenly punctured; sides gently arcuated; callosities small, poorly defined; collum distinct; hind edge sinuated; sometimes a median smooth line is indicated. Scutellum about as in *plagiatus*, strongly, transversely rugose. Elytra closely, evenly punctured, the punctures coarser than in either of the allied species; embolium rather broad, becoming evanescent at middle of corium; cuneus moderately depressed as in *rubicundus*. Legs rather short as in *rubicundus*, the tibial spines black and shorter than the thickness of the member. Male genital segment produced on its ventral aspect, its apex rounded and pale; the claspers inconspicuous, formed much as in *rubicundus* but the sinistral shorter and blunter.



Color a bronzy grey-brown, much as in *plagiatus*, varying to deep black, when immature pale and tinged with green. In pale examples the collum is yellowish and the callosities black, sometimes sending an indistinct blackish ray either side the middle and another next the lateral margins. Scutellum in pale examples with a black geminate median vitta omitting the extreme tip which remains pale in the darkest individuals. Apex of corium with a blackish cloud which is more extended as the individual becomes darker. Extreme tip of clavus black. Cuneus always pale with the tip black; sometimes it becomes rosy red but this color does not seem dependent upon maturity. Membrane faintly enfumed with the nervures yellowish or even red; apex of the larger areole with a fuscous cloud which send a ray to the apex. These parallel rays are normally separated by double their own width but they may become extended so as to cover much of the surface. Antennæ black; second segment pale with its extreme base and apical one third black; narrow base of third segment pale. Femora black in mature examples, the anterior and intermediate pale when immature, more or less invaded with black; tibiæ and tarsi pale, the narrow base and apex of the tibiæ and apex of the tarsi black. Beneath black with a large ivory-white spot on the orificies; either side with a longitudinal pale vitta in pale examples which becomes nearly or quite obsolete in black specimens. Whole surface with a short pale pubescence which is easily rubbed off.

Described from four male and ten female examples taken from yellow sand verbenas (*Abronia latifolia*), growing on the sand dunes at Ingleside, San Francisco, March 24, 1918. A few nymphs and immature were taken with these adults. This species is perhaps nearest to *plagiatus* in many of its characters but its true relationship is with *rubicundus* from which its larger size, punctured hairy face, more convex pronotum, black femora and different coloration, especially of the membrane, will distinguish it. It pertains to Knight's *pratensis* group.

Holotype (No. 410), male, and allotype (No. 411), female, in collection of the California Academy of Sciences.

Paratypes in collection of the Academy and in that of the author.

## 20. *Pilophorus discretus*, new species

Allied to *walshi*, a little smaller and more constricted at the middle; fulvous-brown, elytra paler, the apical silvery line oblique but not dislocated, the polished outer half of the corium beyond this line abruptly fuscous. Length about 4 mm.

Head more produced than in *walshi*, its length before the eye distinctly more than the length of the eye, in *walshi* about the length of the eye; base of the vertex depressed, sharply, slenderly carinate behind. Basal segment of rostrum not exceeding the bucculæ. Pronotum polished; sides almost parallel anterior to the middle or a little constricted at the middle, the humeri angularly prominent; hind margin distinctly concavely arcu-



ated; anterior narrowly depressed imitating an obscure collum. Elytra parallel on basal half, much expanded posteriorly, the polished apical portion of the corium strongly marked and covering only the costal half beyond the second transverse line of silvery hairs; this line moderately oblique and not at all dislocated on the clavus as in *walshi*. Antennæ slender; first segment about as long as the eye; second nearly as long as the head and pronotum united, not obviously thicker at apex; third about one third the length of second.

Color reddish or brownish fulvous, becoming pale on the elytra; disk of the vertex and pronotum shading darker; extreme apex of the clavus and polished area at apex of the corium fuscous. Scutellum and elytra with the usual lines of deciduous silvery hairs; the basal line on the corium short, the apical retreating somewhat at the costa and continuous on the clavus. Cuneus fuscous with an oblique line of silvery hairs from near the inner angle well toward the costa along the basal suture. Membrane dark with a large smoky cloud. Beneath bright fulvous with the abdomen piceous. Legs fulvous, the hind pair infuscated. Antennæ reddish brown, pale at base; (fourth segment wanting).

Described from two female examples; one taken at Colton, Calif., May 28, 1917, the other from Alpine, San Diego County, taken October 3, 1913. This is a small, clearly marked species which may be distinguished by the slender antennæ, long head, short basal segment of the antennæ and bicolored apex of the corium.

Holotype (No. 412), female, from Colton, in collection of the California Academy of Sciences.

Paratype, in collection of the author.

## 21. *Pilophorus tomentosus*, new species

Form of *clavatus*; dull cinnamon brown, rather densely clothed with soft pale hairs; posterior silvery line not dislocated on the clavus. Length  $4\frac{1}{2}$  mm.

Head long, produced below the eye considerably more than the length of the eye; base of the vertex but feebly depressed, the hind edge sharp but scarcely carinated. First antennal segment barely attaining the apex of the head; second as long as the head, pronotum and scutellum together, moderately thickened at apex; third and fourth together three fourths the length of second; fourth one half longer than third. Pronotum parallel on anterior two thirds, then abruptly flaring to the humeri. Rostrum reaching the tip of the hind coxæ; first segment just surpassing the bucculæ. Elytra a little narrower than in *clavatus*; moderately expanded at apex; posterior line of silvery hairs a little oblique but not dislocated at the clavus. Apical field of corium obscurely polished on costal half only.

Color a dull cinnamon brown, sometimes a little clearer on base of the elytra and beneath, more or less tinged with red on the head, pronotum and antennæ. Apical portion of second and third antennal segments fuscous, the fourth whitish, infuscated at apex. Scutellum with the usual lateral and apical lines of silvery hairs. Posterior silvery line of the elytra a little advanced at the commissure, not dislocated at claval suture. Pol-



ished apical area of the corium a very little darker. Basal submargin of the cuneus with a cuneiform line of longer silvery hairs. Membrane obscure with a fuscous median cloud. Venter with an oblique area of silvery hairs on either side.

Described from three male and fourteen female examples taken on willows at San Juan Capistrano, Calif., June 24, 1914. The dull brownish color and pubescent surface will distinguish this species.

Holotype and allotype in author's collection.

Paratypes in collection of the California Academy of Sciences and in that of the author.

## 22. *Pilophorus tibialis*, new species

Allied to *clavatus* and still more closely to *cinnamopterus*. Second antennal segment gradually much thickened toward its apex, third fuscous, fourth mostly white; posterior silvery line on the elytra entire; hind tibiae flattened and curved; membrane with a fuscous area overrunning the areoles; apex of the corium polished across its whole width. Length 5 mm.

Head shaped as in *clavatus* but somewhat broader at base; viewed from before narrower and more pointed than in *amœnus*; viewed from the side more depressed and subcarinate below the eye, the apex surpassing the eye by considerably more than the length of the eye; vertex deeply impressed either side, the median line sometimes broadly, slightly carinate, not at all sulcate; the hind margin more strongly elevated than in either allied species; cheeks pointed at apex, almost attaining the tip of the clypeus, their sides feebly arquated. Antennæ about as in *amœnus*; the first segment shorter and the third distinctly longer than in that species; second longer and more clavate than in *clavatus*, about as in *amœnus*; fourth segment a little shorter than third and about equal to first. Rostrum attaining tip of intermediate coxæ, the basal segment reaching hardly more than half way to the anterior angle of the eye. Pronotum about as in *clavatus*, shorter and more finely rastrate than in *amœnus*, distinctly impressed between the callosities. Elytra about as in *amœnus*, the posterior silvery line often a little sinuated but not dislocated at claval suture; corium beyond this line polished across its whole width. Hind legs longer than in *clavatus*, about as in *amœnus* but with their tibiae still broader and more curved in both sexes, its width at the basal third nearly equal to the width of the femora. Sinistral male clasper transverse, longer than broad, its apex abruptly armed with a small acute, incurved tooth. In *amœnus* this clasper is more quadrangular with its apical hook scarcely more than an acute tubercle while in *clavatus* this clasper is lunate with its apex flattened and even broader than the base.

Color piceous-black, the elytra before the posterior silvery line dark cinnamon brown; head, anterior portion of pronotum and beneath more or less tinged with cinnamon; the anterior and intermediate tibiae, at least at apex, paler; base of the vertex and clypeus infuscated in pale examples. Antennæ pale brown or tinged with castaneous, the clavate portion of the



second segment piceous; third infuscated, paler at base; fourth white, minutely tipped with fuscous. Rostrum pale piceous. Posterior line of silvery hairs on the elytra usually a little sinuated, not at all dislocated at claval suture. Apex of clavus, corium behind the silvery line for its whole width and the cuneus moderately polished and infuscated. Membrane infuscated, with a deeper blackish cloud covering the larger areole and adjoining surface posteriorly. Raised disk of the scutellum bounded by the usual lines of silvery hairs at each side and at the apex. Base of the hind tarsi and often of the tibiæ paler brown.

Described from 32 examples, representing both sexes, taken on coniferous trees at Cayton in eastern Shasta County, Calif., and at Sisson, Calif., July 15 to 27, 1918. These were much more abundant on pines but were also taken on firs and cedars. This species may be distinguished by the prominent base of the vertex, the broad, curved hind tibiæ, and the fuscous third and white fourth antennal segments. I have specimens from Manitou, Colo., that do not differ from this species and Mr. W. M. Giffard has taken it at Donner Lake, Placer County, Calif., at an elevation of 6000 feet. It is probably the common species on pines throughout California.

Holotype (No. 413), male, and allotype (No. 414), female, from Cayton, and paratypes in collection of the California Academy of Sciences.

### 23. *Pilophorus crassipes*, new species

Allied to *tibialis* but with narrower hind tibiæ; vertex with a median sulcus; membrane with a blackish lunule behind the areoles; length 6 mm.

Head broad triangular and flattened much as in *tibialis*. Base of the vertex much depressed; hind margin strongly elevated; median line sulcate; front of vertex with evident striæ; apex of the cheeks narrowly truncate, considerably exceeded by the clypeus; sides of the head bluntly carinate before the eye as in the allied species. Second antennal segment rather thicker than in either *amænus* or *tibialis*, becoming less abruptly narrowed toward the base, thus giving the antennæ a heavier look; third segment nearly twice the length of first and almost as thick; fourth three fourths the length of third and more slender. Rostrum attaining the hind coxæ; the basal segment much surpassing the bucculæ but not reaching the base of the head. Pronotum broader than in *tibialis* and *amænus*; as wide as the head across the eyes; disk posteriorly strongly rugose-shagreened. Posterior line of silvery hairs on elytra entire, not dislocated at claval suture; the surface of the clavus and corium behind this line and the cuneus polished. Hind tibiæ long, flattened and curved but not so strongly as in *tibialis*, its greatest width about half that of the femora. Upper surface, of the elytra at least, clothed with scattering short erect stiff fuscous hairs.



Color piceous-black, becoming more brownish on head and antennæ, the thickened apical portion of the second segment shading to darker piceous; fourth segment white with only the tip dusky. Lines of silvery hairs on the scutellum and elytra more slender than in the allied forms, the posterior straight and entire, not dislocated on claval suture. Membrane paler than in the allied forms, with a broad fuscous lunule at apex of the larger areole.

Described from a male from Glen Echo, Md., July 20, a female from Washington, D. C., June 15, both taken by the late Otto Heidemann and determined by him as "*Pilophorus crassipes* Uhl. MS.", and a female taken by myself at Riverton, N. J., August 17, 1902. Most of my material in both this species and the next, including specimens determined by Dr. Uhler, was sent to Dr. Reuter for study but a short time before his death and has never found its way back to me. These species however are very distinct and can safely be described from scant material. Both were listed by Heidemann in 1892 (Proc. Ent. Soc. Wash., ii, p. 225), but his comparative notes do not form a proper description of the species. *P. crassipes* is common on pine throughout the east.

Holotype, female, from Wash., D. C., and allotype, male, from Glen Echo, in collection of the author. Paratype in collection of the California Academy of Sciences.

#### 24. *Pilophorus lætus*, new species

Size and aspect of *discretus* but very distinct from all our other species by the abruptly clavate second antennal segment. Length  $3\frac{1}{2}$  mm.

Head large; viewed from before broadly rounded at apex with the narrow pointed clypeus projecting a little below the cheeks. Face convex; vertex with a median sulcus, scarcely depressed at base, the hind edge very slenderly carinate. Sides of the head strongly, obtusely carinate beyond the eyes. Antennæ slender; the apical one third of second segment abruptly, strongly clavate. Rostrum reaching the hind coxæ, the first segment hardly attaining the base of the head. Pronotum short, sides parallel anteriorly, the humeri angularly produced but not wider than the head across the eyes. Elytra much expanded at apex; anterior silvery line oblique, posterior interrupted from the cubital vein almost to the claval suture, not dislocated on clavus; Apex of the clavus and corium beyond this line for their whole width and the cuneus polished, the latter with a silvery point at its inner angle.

Color piceous or more or less castaneous, becoming paler on the head antennæ and legs. Club of second antennal segment piceous, preceded by a paler space; third segment white, fuscous at tip, (fourth segment wanting). Base of elytra bright cinnamon as in *amænus*. Membrane a little



fuliginous with a large fuscous cloud centered at the apex of the areoles. Base of the anterior coxæ, much of the posterior, and base of the tarsi whitish.

Described from one female example collected by Mr. Otto Heidemann at Rock Creek, D. C., June 20, 1890, and determined by him as "*Pilophorus lætus* Uhl." I took one male at Washington, D. C., June 25, 1905, and a female at Woodbine, N. J., August 21, 1902, but both are now too imperfect to be used as types.

Holotype in collection of the author.

The following key will distinguish our recorded North American species of *Pilophorus*:

- Third antennal segment with the apical one third abruptly clavate; posterior silvery line interrupted on the corium, not dislocated at claval suture; length  $3\frac{1}{2}$  mm. .... *lætus*, new species
- Third antennal segment gradually thickened toward the apex or nearly linear ..... 1
1. Third antennal segment linear or practically so; posterior silvery line entire, a little oblique; length 4 mm. .... *discretus*, new species
- . Third antennal segment obviously thicker at apex. .... 2
2. Third antennal segment but little thickened at apex. .... 3
- . Third antennal segment much thickened at apex, clavate; apex of elytra smooth; length 5 to 6 mm. .... 6
3. Surface clothed with rather long appressed grey hairs. .... 4
- . Surface smooth or with scattering stiff hairs; apex of corium polished exterior to cubital vein only; posterior silvery line dislocated ..... 5
4. Apex of corium polished across its whole width; posterior silvery line dislocated at the clavus. .... *schwarzi* Reut.
- . Apex of corium polished exterior to cubital vein only; posterior silvery line entire ..... *tomentosus*, new species
5. Length about  $3\frac{1}{2}$  mm.; basal segment of rostrum scarcely surpassing the bucculæ; base of fourth antennal segment broadly pale. .... *walshi* Uhl.
- . Length 5 mm.; basal segment of rostrum nearly attaining base of head; base of fourth antennal segment very narrowly pale. .... *clavatus* Linn.
6. Elytra comparatively broad, but little widened apically; hind tibiæ normal; fourth antennal segment white with apex black. .... *cinnamopterus* Kb.
- . Elytra more expanded apically; hind tibiæ flattened and more or less curved ..... 7
7. Third antennal segment white; base of vertex scarcely elevated, its median line sulcate ..... *amænus* Uhl.
- . Third antennal segment fuscous or black. .... 8
8. Base of vertex sulcate; membrane with a blackish lunule at apex of the areoles; elytra clothed with short, stiff, erect hairs. .... *crassipes*, new species
- . Base of vertex not sulcate; membrane with a large blackish cloud covering the larger areole and invading the surface beyond; elytra smooth ..... *tibialis*, new species



25. *Lopidea occidentalis*, new species

Closely allied to *media* Say and apparently the western representative of that species; above sanguineous, scutellum, callosities, antennæ and markings on the head black; right clasper of male without subapical tooth. Length  $5\frac{1}{2}$  mm.

Structural characters very near to those of *media*. Vertex a little fuller and more convex. Antennæ shorter, as long as from apex of head to base of cuneus. Dextral clasper of male broad, strap-shaped as in *media* but without the subapical tooth, the basal tooth shorter, more slender and incurved from near its base, just attaining the base of the dorsal tooth of the pygofer; this median dorsal tooth on the pygofer is much larger in the present species, surpassing the anal tube, slender and hooked at apex. Sinistral clasper elongate-triangular, acute at superior apical angle; fringed ventrally with long pale hairs. In *media* the dextral clasper is armed with a produced tooth before its apex dorsally; the basal tooth is very long, curved, and fully equals the dorsal tooth of the pygofer; this dorsal tooth much shorter and armed with an apical hook; the sinistral clasper, also, is bilobed, both lobes being broadly rounded at apex.

Color sanguineous as in *media*; clypeus, two longitudinal areas on the vertex and its base black, these markings sometimes extended so as to cover most of the surface. Callosities black, contiguous. Scutellum black tinged with red at apex. Clavus and inner field of corium more or less infuscated, darker in the male. Membrane blackish, iridescent, the nervures black. Antennæ and legs black or nearly so, the femora invaded with pale at apex. Sternum and middle of venter more or less clouded with black, the male genitalia red. Rostrum piceous, reaching the hind coxæ.

Described from 39 specimens, representing both sexes, taken at Palm Springs, Calif., May 19, 1917, on *Croton californicus*, found growing near the mouth of Andreas' Canyon. The male genital characters and shorter antennæ will distinguish this species from its eastern ally. The general color, also, is deeper, more as in *reuteri* and *cæsar*.

Holotype (No. 415), male, allotype (No. 416), female, and paratypes in collection of the California Academy of Sciences.

26. *Hadronema infans*, new species

Small, black; posterior lobe of pronotum and elytra dull sanguineous; inner field of corium obscured, the membrane black; length  $3\frac{1}{2}$ -4 mm.

Head as in *picta*, the basal impression of the vertex deep; antennæ short, as long as from apex of head to base of cuneus. Basal lobe of scutellum covered by the pronotum, the apical lobe convex, without a basal depression. Rostrum attaining the apex of hind coxæ; tip of venter reaching to apex of the cuneus. Male genital characters distinctive. Dextral clasper elongate-conical, curved and almost hooked at apex which passes just above



the apex of the sinistral clasper; this sinistral clasper convex, ligulate, rounded at tip and incurved against the apex of the genital segment; both claspers with a few long stiff hairs ventrally.

Color black, more or less covered with a white bloom, especially on the head and pronotum; head obscurely marked with pale next the eyes and on the cheeks. Posterior lobe of pronotum and elytra obscure sanguineous, paler on the humeri and base of the corium; the clavus and inner field of the corium obscured or blackish. Scutellum blackish; membrane black; sides of venter more or less tinged with reddish. Upper surface sparsely clothed with very short appressed pale hairs.

Described from 69 examples taken at Palm Springs, Calif., May 22, 1917, on *Dalea emoryi* found growing on the floor of the desert a mile or two east of town. This species is nearest *picta* in size and genital characters but is very distinct from any previously described species.

Holotype (No. 417), male, allotype (No. 418), female, and paratypes in collection of California Academy of Sciences.

## 27. *Hadronema albescens*, new species

Allied to *decorata* Uhl.; white or almost lead-color; head, base of antennæ, scutellum and femora fulvous; inner angle of corium with a blackish spot; length 4 mm.

Head about as in *militaris*, the vertex flatter than in *robusta*. Rostrum attaining the middle of intermediate coxæ, its first segment scarcely surpassing the base of the head. Antennæ about as in *robusta*; second and third segments equal in length; first and fourth subequal, the first thickened and fusiform. Pronotum rather less roughened than in the allied species, the callosities large but not prominent; anterior margin showing a flat membranous expansion covering the base of the head but this cannot properly be designated as a collum and becomes a mere margin in the allied forms; carinate lateral margins obtuse; humeral angles rather prominent. Scutellum flattened. Elytra parallel; costal margin sharply distinguished and narrowly foliaceous; cuneus unusually long and narrow. Upper surface of the pronotum, scutellum, clavus, and disk of the corium clothed with scattering stiff fuscous hairs springing from fuscous dots; sides of corium and cuneus with a softer white pubescence. Legs long, the tibiæ armed with long stiff black bristles, much longer than the thickness of the member. Male genital characters obscure. Dextral clasper broad, flat, bent in its own plane at about the middle and truncate at apex; sinistral clasper produced in a long acute black spine.

Color white or somewhat lead-color; head, scutellum and coxæ of a pale dull fulvous, the borders of the eyes, cheeks, loræ and bucculæ white; basal segment of the antennæ and femora of a deeper fulvous. Antennæ, except basal segment, rostrum, tibiæ and tarsi black; the base of the second antennal segment, of the rostrum and of the tibiæ paler or fulvous; pronotum, venter, clavus and disk of the corium more or less darkened or lead-color and punctured with fuscous at base of the black hairs. Inner angle of corium with a transverse blackish spot not passing the radial vein. Membrane white, somewhat infuscated in the areoles, the veins blackish. Hind femora and pygofer of the female blackish at base.



Described from 80 examples representing both sexes, taken on *Dalea emoryi* at Palm Springs, Calif., May 18-22, 1917. A few examples were also captured on a species of *Atriplex* where they probably were resting. This is identical with the "immature variety" (No. 777) mentioned by Dr. Uhler in his description of *Hadronema decorata* but it is a very distinct species. It is still nearer *H. splendida* Gibson (Can. Ent., 1, p. 84, 1918) but is sufficiently distinct.

Holotype (No. 419), male, allotype (No. 420), female, and paratypes in collection of the California Academy of Sciences.

## 28. *Orthotylus hamatus*, new species

Form and size of *languidus* nearly; clear light green; membrane uniformly whitish hyaline; length 6 mm.

Elongate oval, rather broad, nearly smooth, clothed only with very minute pale pubescence. Vertex flattened across the base in the male, scarcely so in the female, the basal carina sharp. Front moderately convex, less so in the male; characters of the head about as in *languidus*; clypeus prominent; antennæ short; second segment distinctly shorter than in *languidus*, hardly longer than the basal width of the pronotum. Pronotum about as in *languidus*, its length one half its basal width; sides straight; callosities large, oval, widely separated; hind margin concavely arcuated. Elytral costa slightly arcuated. Apex of abdomen reaching to middle of cuneus in the male, to its apex in the female. Rostrum attaining the posterior margin of the metasternum; first segment slightly surpassing the base of the head. Dextral clasper of male broad, strap-shaped, truncate at its incurved apex, its base broadly extended dorsally and armed with a sharp curved hook which is parallel to and about half as long as the broad ventral portion. Sinistral clasper linear, subterete, attaining the apex of the ventral plate of the genital segment. This genital conformation is very nearly as in *languidus* with the addition of the sharp parallel dorsal hook added to the dextral clasper.

Color a pale clear bluish green deepened along the clavale suture; head and breast sometimes paler; membrane whitish hyaline, very slightly infuscated in the male, the apical margin slenderly darker. Eyes and tip of the tarsi and rostrum black. Antennæ tinged with yellow and somewhat infuscated at apex.

Described from three male and seven female examples taken on willows growing by the river above Colton, Calif., May 28, 1917, and one female taken at Soboba Springs near San Jacinto, Calif., June 2, 1917.

This species may be distinguished from *languidus* by its more pronounced green color, the darker line along the claval suture, the uniformly hyaline membrane and especially by the want of



the conspicuous long pale hairs clothing the upper surface of that species.

Holotype (No. 421), male, allotype (No. 422), female, and paratypes in collection of the California Academy of Sciences.

### 29. *Orthotylus albocostatus*, new species

Aspect of *uniformis*; closely allied to *fraternus* but larger and broader with the costal margin of the elytra quite broadly whitish; length 5-5½ mm.

Head about as in *uniformis*, longer and more oblique than in *fraternus*; length below the eye distinctly greater than the greatest length of the eye; clypeus very prominent and convex; vertex but little flattened, the carina feeble. Pronotum short, transverse; humeri prominent, flattened; sides sharply carinate; callosities but little elevated, in the female distinguished by a transverse depression. Elytra long, the costa feebly arcuated in the male, more strongly in the female; cuneus in the male much elongated, Rostrum reaching the apex of the intermediate coxæ. Antennæ about as in *fraternus*; first segment thicker, armed within near the apex with two or three stiff fuscous hairs which are longer than the thickness of the segment; second segment distinctly longer than the basal width of the pronotum; third nearly equal to second; fourth hardly longer than first. Surface clothed with soft white hairs which become scale-like and conspicuous on the pronotum and head and are intermixed with stiffer fuscous ones on the elytra interior to the radial vein. Male genitalia small; dextral clasper nearly circular, pedicellate; sinistral scarcely twice the size of the dextral, transverse or a little oblique.

Color pale dull green, becoming still paler on the head and pronotum and darker on the clavus. Pronotum and scutellum with an obscurely paler median line; costal margin to the radial vein whitish hyaline, this pale margin fading out on the cuneus. Membrane moderately infuscated, paler in the areoles, the veins pale or green. Antennæ green at base becoming infuscated at apex. Tip of rostrum, apex of tarsi and tibial bristles black.

Described from twelve male and nine female examples taken at Keen Camp, San Jacinto Mountains, Calif., June 12, 1917, on a species of *Gilia* with slender foliage, and one male taken in Muir Woods, Marin county, Calif., May 19, 1915. This form may be distinguished among our green species by its long head, the pale costal margin and the fact that the brown hairs on the elytra are found only on the surface interior to the radial vein.

Holotype (No. 423), male, and allotype (No. 424), female, from Keen Camp in collection of the California Academy of Sciences.

Paratypes in the collection of the Academy and in that of the author.



30. *Parthenicus covilleæ*, new species

Aspect of *picicollis* but paler; fulvous yellow with uniformly black membrane; length 3-4 mm.

Head somewhat less produced than in *picicollis*, the extension below the eye rather less than the greatest width of the eye; clypeus prominent with a deep depression between its base and the apex of the front. Antennæ similar to those of *picicollis*; first segment thickened, scarcely surpassing the apex of the head; second subequal to third and fourth united. Elytral costa very slightly arcuated. Upper surface clothed with long stiff concolorous or pale hairs becoming blackish on the disk of the elytra and somewhat matted about the apex of the clavus giving that place a blackish aspect in perfect examples. Male claspers small, rounded when viewed from the side; the dextral subacute and oblique; the sinistral produced along the ventral wall of the segment to its apex.

Color a soiled yellowish fulvous, more or less tinged with red, in fully colored examples showing a transverse band covering the scutellum, base of the elytra and the cuneus, reddish. Membrane uniformly deep fuscous, the nervures red; sometimes there is a small paler lunule at the apex of the cuneus. Legs and antennæ paler, the basal segment of the latter more reddish. Tarsal claws black. Abdomen of the male sometimes tinged with green.

Described from 27 examples, representing both sexes, taken on creasote bush, *Covillea mexicana*, at Palm Springs and Coachella, Calif., May 18-21, 1917, where it was abundant and just reaching maturity. The uniformly yellowish color and blackish membrane will distinguish this species. Only the most fully colored individuals show indications of sanguineous irroration in the reddish areas on the base of the elytra and cuneus.

Holotype (No. 425), male from Palm Springs, allotype (No. 426), female from Coachella, and paratypes in collection of the California Academy of Sciences.

31. *Parthenicus candidus*, new species

Closely allied to *vaccini*, the femora wanting the fuscous dotting but marked with a few black points; white, dotted with black; base of scutellum and thickened vein at base of membrane sanguineous; membrane white with two marginal spots and a few discal points brown; length 3-3½ mm.

Male: Head short, vertical; produced below the eye for less than the width of the eye; clypeus prominent; its basal incisure distinct. Antennæ as in *vaccini*; first segment but little surpassing the apex of the head, thicker, armed near the apex with two black bristles set in black dots; second as long as basal width of pronotum; third two thirds the length of second; fourth hardly longer than basal. Rostrum attaining the middle of the venter, the first segment passing the middle of the anterior coxæ.



Pronotum a little broader with the sides more oblique than in *vaccini*; more strongly depressed anteriorly, the callosities obscure. Basal lobe of scutellum somewhat exposed, Elytral costa feebly arcuated. Claspers similar to those of *vaccini*. Sinistral narrow, lying along the ventral wall of the segment and reaching to its middle line. Dextral terete, slender, curved and overlapping the sinistral a little. In all specimens before me this clasper is lifted free from the margin and this may be its normal position.

Color a dead white becoming soiled or testaceous on the head and anterior lobe of pronotum; surface of pronotum minutely dotted with brown omitting its posterior disk. Basal lobe of scutellum clouded with sanguineous which color may invade the base of the posterior lobe. Elytra dotted with black, these dots arranged somewhat in lines, two rows of seven each on the clavus being quite regular; those of the corium paler and more confused, towards the apex carrying brown hairs. Apex of the clavus with a pencil of black hairs and there are three similar clusters on the cuneus, one at its basal angle and two beyond the middle of the inner margin. Thickened vein at base of the membrane sanguineous. Membrane clear white with two fuscous clouds on the apical margin and a few faint brown points on the disk, the veins white. Antennæ with a black point near the apex of the first segment and three or four fainter dots on the second, sometimes obsolete. Femora with a few black points, one near the apex of the hind pair being larger. Tibiæ strongly dotted.

Female sometimes brachypterous, then ovate with a shorter pronotum and a soiled white color, more strongly spotted and wanting the sanguineous marks. The macropterous female similar to the male.

Described from three male and three female examples taken on *Hymenoclea salsola* at Coachella, Calif., May 16, 1917, and at Palm Springs, May 21, 1917. This species is very close to *vaccini* from Massachusetts but the difference in the food-plant and locality in addition to color characters would seem to warrant its separation; *vaccini* has the femora infuscated or irrorate at apex and the disk of the pronotum and scutellum evenly dotted; it also wants the sanguineous markings and has the dotting of the elytra confined to the corium and fainter and more irregular, and the disk of the membrane without brown points. Both have the pale hairy vestiture.

Holotype (No. 427), male, allotype (No. 428), female, and paratypes in collection of the California Academy of Sciences.

Our eight species of *Parthenicus* may be distinguished by the following key:

- |  |                      |
|--|----------------------|
| Color, including the membrane, white.....  | 1                    |
| Color pale, usually irrorate with sanguineous or mostly sanguineous;<br>membrane fuscous or mostly so .....  | 2                    |
| 1. Femora irrorate with fuscous at apex; elytral dots omitting the<br>clavus; disk of pronotum and scutellum dotted; no red markings,<br>eastern, on <i>Vaccinum</i> ..... | <i>vaccini</i> V. D. |



- Femora with a few black points; clavus with two rows of black points; disk of pronotum and scutellum free from points; base of scutellum and basal vein of membrane sanguineous, western, on Hymenoclea ..... *candidus*, new species
- 2. Membrane fuscous with two pale marginal spots beyond the cuneus. 3
- Membrane uniformly fuscous ..... 4
- 3. Tibiæ minutely dotted with sanguineous; inner angle of elytra infuscated, the surface minutely dotted with sanguineous; membrane faintly enfumed ..... *psaloides* Reut.
- Tibiæ coarsely dotted with fusco-sanguineous; elytra uniformly more coarsely dotted with sanguineous or washed with that color; membrane deeply enfumed, the paler spots contrasted. *ruber* V. D.
- 4. General color white or pale salmon with a sanguineous band crossing the scutellum and base of elytra; without sanguineous irrorations; hind femora fusco-sanguineous ..... *giffardi* V. D.
- General color croceus or testaceous, usually irrorate with sanguineous or mostly sanguineous ..... 5
- 5. Pronotum and scutellum piceous-brown; elytra sanguineous or heavily irrorate with that color ..... *picicollis* V. D.
- Pronotum and scutellum not colored differently from elytra ..... 6
- 6. Testaceous, irrorate with sanguineous; femora heavily irrorate, ..... *soror* V. D.
- Croceus, without irrorations; base of elytra and cuneus sometimes sanguineous; femora concolorous ..... *covilleæ*, new species

### 32. *Psallus croceus*, new species

Aspect of *seriatus* but more brightly colored; whitish, thickly sprinkled with bright croceus; membrane irrorate; length 3-3½ mm.

Head short, projecting below the eye for a distance equal to the greatest width of the eye; clypeus broad, poorly distinguished. Antennæ normal for the genus; first segment scarcely surpassing the apex of the head; second nearly equal to the basal width of the pronotum; third and fourth together not longer than second; third one fourth longer than the fourth. Pronotum short and broad, but slightly declinate; its length two-fifths its basal width; sides feebly arcuate; hind margin a little concavely arcuate; callosities small. Basal lobe of scutellum exposed; costal margin of elytra feebly arcuated. Hind femora broad, flattened. Dextral male clasper long, curved and tapering, transverse, reaching across the genital segment; sinistral correct, triangular, flattened, but little shorter than the dextral.

Color testaceous-white; upper surface closely sprinkled with rather large orange dots, the disk of the cuneus quite strongly tinged with orange. Membrane whitish hyaline, sparsely sprinkled with pale fuscous dots; veins and a large spot at apex of cuneus white, the latter bordered behind by a fuscous cloud; areoles infuscated about their margins, shading to hyaline on their basal disk; hind femora usually with a few dusky dots, about three of which are larger and persistent. Tibiæ armed with a few stout bristles, posterior with a row of large black dots; the anterior and intermediate with a few small dots toward their base. Base of the female oviduct sometimes infuscated. Upper surface clothed with stiff somewhat appressed pale hairs.

Described from six male and eight female examples taken on a sycamore tree in Andreas' Canyon at Palm Springs, Calif.,



May 19, 1917. The coarse orange dotting of this species will serve to distinguish it.

Holotype (No. 429), male, allotype (No. 430), female, and paratypes in collection of the California Academy of Sciences.

### 33. *Atomoscelis peregrinus*, new species

Color and aspect of *Sthenarus cuneotinctus* but aside from generic characters it may be distinguished by its larger size and uniformly pale antennæ and legs; pale greenish with red cuneus; length  $3\frac{1}{2}$  mm.

Head short, broad, vertical; clypeus prominent, abruptly bent so the apex is inferior and almost horizontal; its base on the line connecting the antennæ, the suture distinct; apex of head forming a right-angle; gula wanting; vertex broad, moderately convex, ecarinate at base. Antennæ reaching nearly to tip of clavus; basal segment thick, not surpassing apex of head; second as long as the pronotum and half the scutellum, two fifths the basal width of the pronotum. Rostrum a little surpassing the hind coxæ in female, attaining the fifth ventral segment in male. Pronotum short, trapezoidal, sides strongly oblique; callosities small, distinct; base of scutellum covered. Elytra parallel or nearly so. Hind femora saltatorial, broadly flattened. Surface above clothed with minute deciduous scale-like white hairs. Male claspers large, broad, plate-like; the dextral nearly a parallelogram with its apex oblique and produced above; sinistral transverse with its dorsal and ventral angles subacute.

Color pale yellowish becoming greenish on the elytra and abdomen or at times altogether greenish; cuneus red; tarsi tipped with black, the legs otherwise immaculate.

Described from two male and thirty-one female examples taken on *Dalea schottii* at Coachella, Calif., May 16, 1917. At Palm Springs it was also taken in numbers, with its young, on this *Dalea* and on *Krameria canescens*.

Holotype (No. 431), male, allotype (No. 432), female, from Coachella, and paratypes in collection of the California Academy of Sciences.

### 34. *Tuponia lucida*, new species

Pale tender green with subhyaline elytra; hind tibiæ dotted with black; length about 4 mm.

Head short, vertical, somewhat produced, the facial angle being a little less than a right angle; produced below the eye for almost the length of the eye. Vertex broad, quite convex, ecarinate at base. Clypeus broad, flat at base with the basal suture nearly obsolete; rounded and prominent



at apex; gula scarcely indicated. Rostrum reaching hind coxæ; first segment attaining base of head. Basal segment of antennæ scarcely surpassing apex of head; second almost as long as basal width of pronotum, a little longer than third and fourth together; fourth two thirds of third. Pronotum short, transverse; its length two fifths its basal width, the sides a little rounding to the anterior angles; callosities narrow, well defined. Elytral costa very slightly arcuated. Dextral male clasper elongated, obtuse, about four times wider than long, just passing the middle of the genital segment; sinistral porrect, triangular, transversely convex.

Color pale or whitish green, sometimes tinged with yellow on the head; the elytra subhyaline. Membrane whitish hyaline, highly iridescent; veins pale green. Antennæ slightly infuscated at apex. Tibiæ dotted with black, these dots on the anterior and intermediate very small; apex of tarsi black. Upper surface clothed with soft white hairs.

Described from one male and seven female examples taken on willows along the Tahquitz trail in the village of Palm Springs, Calif., May 21, 1917. This form may be distinguished by its uniform pale green color and spotted tibiæ. Its longer head and uniform coloring will distinguish it from our other species of *Tuponia*.

Holotype (No. 433), male, allotype (No. 434), female, and paratypes in collection of the California Academy of Sciences.

### 35. *Tuponia dubiosa*, new species

Very close to *lucida*; smaller, proportionately broader and more deeply colored; light green, membrane immaculate; hind femora broader and more distinctly dotted, the tibial dots smaller; length 3 mm.

Characters of head about as in *lucida* but with the vertex obviously narrower; basal segment of rostrum not passing the base of the head; hind femora broader than in *lucida*, subovate.

Color more distinctly green than in *lucida*, more tinged with soiled fulvous on the head and beneath, especially on hind femora and sides of abdomen. Femora minutely but distinctly dotted with brown, the dots on the anterior and intermediate sometimes almost obsolete; tibiæ white, the tibial spines pale, springing from minute black points which are much smaller than in *lucida*. Membrane whitish hyaline, immaculate or apparently so. Upper surface clothed with soft white hairs. Base of oviduct infuscated.

Described from six female examples taken on palo verde at Coachella, Calif., May 16, 1917. Although very close to *lucida* this form seems to be distinct by its smaller size, less elongated form, deeper color, immaculate membrane and nearly impunctate tibiæ.

Holotype (No. 435), female, and paratypes in collection of California Academy of Sciences.



### 36. *Plagiognathus pictipes*, new species

Above pale greenish becoming yellowish on the head; beneath and legs piceous or almost castaneous, somewhat irrorate with pale; abdomen green; length 3 mm.

Head narrower than in *Europiella stigmosa*, but little more than half the basal width of the pronotum, vertical before, the face scarcely inferior as in *Europiella*; clypeus but little prominent, the basal suture distinct but not deep, a little above the insertion of the antennæ; facial angle rather less than a right angle; gula none. Rostrum attaining the base of the intermediate coxæ; basal segment dilated, just passing the base of the head. Antennæ short; first segment hardly attaining apex of clypeus; second as long as the width of head across the eyes; third two thirds the length of second; fourth two thirds of third. Pronotum but little declinate anteriorly, the callosities obvious but not prominent; basal lobe of scutellum covered. Costal margin of elytra but feebly arcuated; the abdomen of the female reaching half way from tip of cuneus to apex of membrane. Hind femora broad, compressed; hind tarsi with the third segment scarcely longer than second. Characters of male claspers obscure, the sinistral small, transverse.

Color above pale greenish or whitish, becoming yellowish or even fulvous on the head; beneath clear pale green marked with fuscous or dark castaneous on lower surface of head and on the breast. Legs whitish, coarsely, irregularly dotted with blackish castaneous, at times becoming almost entirely black, especially on the hind femora; all the tibiæ white with white spines springing from small black points; tarsal claws black; oviduct of female sometimes infuscated. Apex of the antennæ infuscated, the basal segment more or less marked with castaneous. Elytra immaculate greenish. Membrane whitish hyaline, faintly irrorate with dusky, nervures pale. Wings whitish hyaline, highly iridescent.

Described from one male and nine female examples taken at Coachella, Calif., near the railway station, May 13, 1916. The single male is immature indicating that as in *decolor* the male appears later than the female. This species like *decolor* has the aspect and general characters of *Europiella* but the form of the head and pronotum are those of *Plagiognathus*. In a measure they seem to connect these two genera. In the present species the upper surface is clothed with matted white hairs with some longer fuscous ones intermixed on the corium and cuneus.

Holotype (No. 436), female, allotype (No. 437), male, and paratypes in collection of the California Academy of Sciences.

### 37. *Europiella sparsa*, new species

A small thick-set pale greenish white insect, thickly clothed above with deciduous scale-like white hairs intermixed on the elytra with longer fuscous ones; femora and tibiæ dotted; length 3 mm.



Head broad and short, its width across the eyes three fourths that of the basal margin of the pronotum; nearly vertical, the face below somewhat inferior; its apex, viewed from the side, broad and square; produced below the eye for a distance almost equal to the length of the eye; clypeus flattish, poorly distinguished, its basal suture indistinct but obvious, on a line distinctly above the base of the antennæ; gula wanting. Rostrum attaining the hind coxæ; basal segment expanded reaching the base of the head. Antennæ short; basal segment about reaching apex of clypeus; second equal to the width of the head across the eyes; third about two thirds of second; fourth one half the third. Pronotum short and broad, feebly convex; sides but little oblique, feebly arcuated; hind margin straight; callosities indistinct. Basal field of scutellum covered. Elytra short and broad; costa distinctly arcuated. Hind femora broad and much flattened; third segment of hind tarsi scarcely longer than the second. Male genital characters obscure, the sinistral clasper small and transverse.

Color obscure testaceous-white, sometimes tinged with yellow or green, especially on the head and abdomen. Antennæ becoming infuscated on their apical half; Femora with a few large scattering brown dots toward their apex, more apparent on the hind pair and less conspicuous in the male, these dots tending to form a line near the lower margin. Tibiæ white, armed with large conspicuous black spines set in black dots. Eyes, apex of the tarsi and of the rostrum black. Oviduct of female more or less infuscated. Lower surface of male sometimes infuscated. Upper surface clothed with closely set silvery scale-like deciduous hairs, intermixed on the elytra with longer fuscous ones. Membrane immaculate.

Described from 10 male and 14 female examples taken on *Atriplex* at Coachella, Palm Springs and Soboba Springs, Calif., May 13, to June 2, 1917. Among our pale species *sparsa* may be distinguished by the stout black tibial spines and the sparse coarse dotting of the femora.

Holotype (No. 438), male, allotype (No. 439), female, and paratypes in collection of the California Academy of Sciences.

### 38. *Catonia helenæ*, new species

Form and size of *majusculus*; cinereous varied with fuscous and croceus; front with an interrupted black band at base and an indefinite area at apex; length 7-8 mm.

Vertex nearly square, a little wider posteriorly; carinæ prominent; anterior margin feebly rounded, passage to the front abrupt; basal margin scarcely angled. Front narrow, much wider at apex; sides straight; carinæ prominent; clypeus more convex with conspicuous carinæ. Elytra long and parallel; venation distinct; stigma about twice longer than wide and crossed at its basal third by an oblique suture, the margin beyond with three small areoles. Lateral plates of the female genital segment short, transverse, their hind edge feebly sinuated and their inner angle obtuse. Plates of the male lanceolate-triangular, acute at apex, their inner basal angles approaching, exteriorly fringed with short pale hairs; median valve produced in a long slender tooth which attains the middle of the plates.

Color soiled yellowish testaceous, tinged with fulvous on the front, mesonotum and elytral nervures. Fovæ of the vertex and pronotum in-



fuscated, those of the front black at base and infuscated at apex next the clypeus. Cheeks, pleural pieces and basal angles of the mesonotum marked with black; median compartments of the mesonotum clouded with black at base and again beyond the middle. Elytra cinereous becoming whitish at apex, with pale fulvous nervures, dotted and maculated with fuscous, the larger spots omitting the clavus and forming about three transverse vittæ on the corium; costal area with an elongated blackish spot near the base, a small one at apex and two well defined spots between; the apical two thirds of the stigma black; membranal portion mostly immaculate. Abdomen more or less clouded with fuscous on its disk; legs pale. Basal segment of the antennæ pale yellowish. Ocelli fulvous.

Described from 35 specimens, representing both sexes, taken on the dead reflexed leaves of the California fan palm, *Washingtonia filifera*, in Andreas' Canyon at Palm Springs, Calif., May 9, 1917. I have dedicated this interesting species to my wife, Helen Van Duzee, in recognition of her enthusiastic interest in entomological pursuits. This is our largest *Catonia* and quite distinct from any other known to me. It seems to be confined to this palm and to find its sustenance among the dead foliage only, as I was unable to obtain any from the living leaves.

Holotype (No. 440), male, allotype (No. 441), female, and paratypes in collection of the California Academy of Sciences.

### 39. *Catonia necopina*, new species

Allied to *nervata* and *albocostata*; dark fuscous-brown with the vertex and pronotum paler; costal and apical veins of the elytra whitish; length 5-5½ mm.

Vertex short, rounding over to the base of the front, the lateral carinæ forming a subacute angle before; base angularly emarginate. Front a little convex in both diameters, very slightly widened toward the clypeus with the sides feebly arcuated; sides acute but scarcely elevated; median carina obsolete; barely indicated at the clypeal suture; surface closely uniformly punctured as is also the clypeus, the latter with an indistinct median carina. Pronotum as in the allied forms. Mesonotum closely evenly punctured, the carinæ obtuse, nearly parallel. Elytra deep smoky subhyaline without reticulations or dots, the nervures distinct. Costal margin with but three areoles between the stigmatal and transverse veins. Lateral plates of the female genital segment transverse-quadrangular, their inner angles subacute; plates of the male about twice longer than wide, parallel, their apices obliquely cut off; median tooth half the length of the plates, rounded at apex.

Color deep smoky brown becoming a paler fulvous-brown on the head and pronotum; the patagiæ and costal margin whitish. Elytral nervures paler beyond the middle, more conspicuously whitish at apex. Front deep fuscous-brown shading to paler at base. Mesonotum tinged with cas-



taneous, the carinae concolorous or slightly paler. Abdomen blackish fuscous, the segments edged with pale, the genital pieces mostly pale. Legs fuscous lined with pale, the tibiae and tarsi mostly pale.

Described from one pair taken at Keen Camp, San Jacinto Mountains, June 9, 1917, on Mt. Tahquitz, at an elevation of about 7000 feet. The food plant is probably cypress. Among the allied species with uniformly fuscous elytra bordered and veined with pale this may be distinguished by the convex, ecarinate, punctured front.

Holotype (No. 442), male, and allotype (No. 443), female, in collection of the California Academy of Sciences.





Van Duzee, Edward P. 1918. "New species of Hemiptera chiefly from California." *Proceedings of the California Academy of Sciences, 4th series* 8, 271–308.

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