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### TEN NEW SPECIES OF *STELIS* FROM CALIFORNIA (HYMENOPTERA, APOIDEA)

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It is becoming evident that our species of *Stelis*, especially in the Southwest, are rather numerous, but their study is hampered by the difficulty of obtaining adequate material. In this connection it is interesting to note that five of the species described here are known only from uniques.

The new species of *Stelis* made known in this paper are all from southern California. The types, except of *Stelis linsleyi*, are in the collection of the Citrus Experiment Station, Riverside, California.

#### ***Stelis* (*Heterostelis*) *anthidioides* new species.**

A large robust bee, with extensive yellow markings, its nearest ally probably being *S. manni* Cwfd. from Arizona. It differs from that species in having the clypeus and sixth segment of abdomen yellow, and yellow bands of other segments very broad and entire.

FEMALE.—Black with light markings as follows: Mandibles, except apical margin, labrum and clypeus; supraclypeal mark much broadened in middle; lateral face marks extending almost to summit of eyes and widened below to occupy the space between antennal socket and eye; broad band on vertex and behind eyes, slightly notched in middle and broadened laterally, with a slender extension downward on cheeks to anterior end of eye, but separated from the eyes and lateral face marks by a narrow dark orbital streak; broad band on lateral and anterior margins of mesoscutum, broadly interrupted medially; axillæ and broad band on margins of scutellum, interrupted medially; tegulæ except reddish central area posteriorly; tubercles, large mark

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beneath tubercles and another small one below base of hind wings; apex of coxæ, most prominent on front and hind pair, and spot on trochanters; apex of femora broadly, the mark extending to middle or slightly beyond on dorsal margin, and nearly to the base on ventral edge, except on hind pair; tibiæ and tarsi entirely, except a somewhat rufescent color on inner side; broad bands on tergites 1 to 6, those on 5 and 6 covering almost entire surface, those on 2 to 4 slightly notched medially in front; and venter almost entirely, all yellow. Basal declivity of tergite 1 black, and base of following segments narrowly black, but almost entirely concealed on tergites 5 and 6. Apical border of tergites 1 to 5 blackish, with the narrow apical depression somewhat reddened. This apical border broadest on tergites 1 and 2 and becoming very narrow on 5. Venter slightly stained with rufous on second segment, and the impunctate, normally concealed (but very broad) portion of segments 3 and 4 largely suffused with fuscous. Antennæ brownish black, the apex of scape on outer side slightly suffused with dull yellow. Wings dark reddish fuscous, the hind pair clearer. Nervures nearly black, the stigma reddish. Head and thorax closely, moderately coarsely punctured. Inner orbits of eyes narrowly impunctate and polished. Propodeum finely and densely punctured. Punctures of tergites a little finer than those of head and notum and nearly as close, except on 3 and 4 where they are sparser, and becoming very dense and rather obscure on 6. Apical dark band of tergites finely and densely punctured except the larger part of apical depression. Tubercles sharply carinate anteriorly, the margin broadly arcuate. Mandibles gently bisinuate on the very broad cutting edge, with faint indication of a median tooth. Labrum dull, minutely and densely punctured, and hairy. Clypeus broadly truncate in front, the margin finely crenulate. Axillæ roundly protuberant laterad. Scutellum with a shallow median groove, the apex subtruncate, the margin subcarinate. Metanotum and propodeum almost vertically declivous beneath the slightly protruding edge of scutellum. Base of propodeum without a transverse, pitted groove. Tergite 6 broadly rounded at apex, the margin erose with blunt little teeth and a much broader short tooth or lobe on each side of middle. Ventrite 6 not at all produced, triangular, the subacute apex thickened, opaquely sculptured and with a very narrow smooth lip. Pubescence ochreous, rather thin and moderately long, most abundant on cheeks, pleura, sternum and base of legs. A dense tuft of hair behind base of hind wings. Hair of mesonotum short and subappressed. Ventrites 2 to 5 with a long apical fringe. Hair on inner side of tarsi ferruginous. Length, 12 mm.; anterior wing, 9 mm.; width of abdomen, about 4.2 mm.

One female (holotype), Riverside, California, on *Hemizonia kelloggii*, June 9, 1927 (Timberlake).

The time of flight and mimetic resemblance of this bee to *Heteranthidium timberlakei* Schwarz suggests that the latter is possibly the host.



For this fine bee I propose a new subgenus of *Stelis*, to be called *Heterostelis*. From typical *Stelis* it differs in having the axillæ not toothed, although they are roundly produced outward beyond margin of scutellum; mandibles very broad on apical edge, with the usual teeth very feebly indicated; anterior edge of mesopleura very abruptly reflexed into a broad, perpendicular face, with the margin between the two surfaces carinate; basal pitted groove of propodeum obliterated, etc. From *Pavostelis* it differs in color and in having the anterior face of mesopleura broad and sharply reflexed, mandibles peculiar, axillæ roundly produced laterad, etc. From *Microstelis* it differs in the mandibles, axillæ, anterior face of mesopleura, and lack of a narrow pitted groove at base of propodeum. From *Protostelis* (*Stelis costalis* Cress. and allies) it differs in the mandibles, axillæ, lack of a broad pitted groove at base of propodeum and in having the sharp anterior edge of tubercles not continued inward beyond the anterior corners of mesoscutum, but it agrees closely in the sharply reflexed anterior face of mesopleura. From *Chelynia*, *Melanostelis* and *Stelidium* it differs in venation and other characters, the second recurrent nervure being received on the cubitus well beyond the apex of second cubital cell.

Other peculiar features shown by the type species are the dull, finely and densely punctate and hairy labrum, erose apical margin of the sixth tergite and the comparatively elongate maxillary palpi. These palpi have two (or possibly three) joints, the apical joint being elongate spindle-shaped, with the thinner apical portion possibly forming another segment, although this can not be verified without a slide preparation.

Other species probably belonging to *Heterostelis* are *Stelis australis* Cresson and *S. manni* Crawford.

Genotype.—*Stelis anthidioides* Timb.

***Stelis* (*Pavostelis*) *anthracina* new species.**

This is a rather small, entirely black bee, with whitish pubescence. From *S. diversicolor* Cwfd. it differs in being rather dull black, with no indication of hair-bands on abdomen.

MALE.—Robust, somewhat dull black, without ornamentation. Mandibles with a red band before the apex. Small joints of tarsi rufescent, but spurs, tegulæ, and antennæ black. Wings a little dusky, with a darker stain at apex and on outer half of marginal cell. Nervures and stigma almost black.



Head distinctly narrower than thorax, about as broad as long. Inner orbits of eyes slightly converging below. Mandibles with three subequal acute teeth. Maxillary palpi one-jointed, the joint about four times as long as thick. Clypeus gently convex, broadly truncate in front, the margin with a fine median notch and sometimes with minute notches on each side. Tubercles rather small, with the front margin somewhat arcuate and sharply carinate, but the carina not extending mesad farther than the corners of scutum. Margins of axillæ and scutellum continuous, the apex of scutellum rounded. Disk of scutellum without median furrow, but basal margin foveately impressed as usual. Pitted groove at base of propodeum very narrow and shallow, distinct only at sides, and more or less obliterated in middle. Punctures of head and thorax close and moderately coarse, becoming sparser on mesopleura. Clypeus dull, finely and densely punctured. Labrum polished, almost impunctate. Metapleura and propodeum finely and closely punctured, but bowl-shaped enclosure of propodeum impunctate, except that it is variably more or less punctured above. Punctures of abdomen close, considerably finer than those of mesonotum, and becoming slightly coarser caudad. Second ventrite closely punctured, but exposed parts of following segments almost impunctate. Pubescence dull whitish, moderately dense and erect on head and thorax, that of the abdomen shorter, mostly sub-appressed, inconspicuous in most aspects, and without indication of apical bands. Ventrites 3 and 4 with a dense apical fringe of ochreous hair, that of 4 broadly interrupted in middle. Ventrite 4 also with an apical comb of short, black, very close set, minute teeth, covering a little more than the middle half and overlapping the inner ends of the hair fringe. Length, about 7 mm.; anterior wing, 5.6 mm.; width of abdomen, about 2.8 mm.

Four males (holotype and paratypes) collected at Andreas Canyon, near Palm Springs, California, on *Encelia farinosa*, three including the holotype on March 24, 1933, and one on April 11, 1936 (Timberlake). Also one male (paratype) in Michener's collection, taken by him at the same place and on the date last mentioned.

A male *Stelis* from Raleigh, North Carolina, on *Rubus*, May 5, 1934 (T. B. Mitchell) in Michener's collection, must be referred to *S. diversicolor* Cwfd. This specimen differs from *anthracina* in being a little more shiny and less closely punctured, the punctures of mesoscutum mostly about a puncture width apart (mostly less than half a puncture width in *anthracina*), and in having the hair of abdomen considerably longer and a little sparser, the hair forming a thin fringe at apex of tergites, but not a distinct band. These North Carolina and California bees are so similar that it is easy to suppose that they are races of one species, which indeed may be the case, unless the females, when discovered, exhibit more distinctive characters.



These bees agree structurally with the subgenus *Pavostelis* Sladen and it is necessary to conclude that the blue color of the type species is not of especial importance in distinguishing the group. Except in venation, *Pavostelis* is similar to *Chelynia* in many ways.

**Stelis (Chelynia) semirubra** new species.

Black, without ornamentation, the abdomen mainly red. There is no other species of this group known with a red abdomen.

FEMALE.—Moderately slender. Head and thorax black, the abdomen red. Triangular mark at base of first tergite, sixth tergite except the base narrowly on each side, and sixth ventrite, black. Fifth ventrite suffused with black except at apex. Antennæ, tegulæ and legs black. Spurs pale brownish. Mandibles black, stained with red before the apex. Wings dusky, the outer half of marginal cell more deeply stained. Nervures and stigma black. Head somewhat wider than long and a little narrower than thorax. Inner orbits of eyes converging below. Mandibles with subequal acute teeth. Maxillary palpi one-jointed, the joint small and spindle shaped. Clypeus broadly truncate anteriorly, the margin denticulate. Tubercles not enlarged nor sharply margined in front. Outer margin of axillæ and scutellum continuous, the latter rounded at apex. Metanotum and propodeum strongly declivous, the base of the latter with traces of a pitted groove laterally. Tergites 1 to 4 moderately impressed at base. Tergite 6 broadly rounded at apex, with a very narrow, smooth, marginal lip. Ventrite 6 barely exceeding the tergite, rounded at apex and without an obvious lip. Head and thorax moderately finely, closely punctured, and shining between the punctures. Clypeus dull, very finely and densely punctured. Labrum closely punctured except at base. Punctures of mesoscutum mostly about one-half to one puncture width apart. Punctures of posterior face of propodeum nearly as coarse as those of mesonotum, but those on the sides and on metapleura much finer. A shallow bowl-shaped area on propodeum polished and impunctate. Punctures of abdomen close, finer than those of mesonotum, and becoming finer and dense on the apical tergite. Venter very finely and densely punctured, the apical segment opaque. Pubescence white, rather short and moderately dense, most abundant on the face. Hair of abdomen short, fine and inconspicuous in most aspects. Tergite 6 and ventrites 2 to 5 with a very short, dense, pale, apical fringe. Disk and apex of ventrite 6 with dense short pubescence. Length, 7 mm.; anterior wing, 4.4 mm.; width of abdomen, 2.3 mm.

One female (holotype), trail above Glen Ivy, Riverside County, California, on *Eriophyllum confertiflorum*, var. *trifidum*, May 13, 1928 (Timberlake).

**Stelis (Chelynia) depressa** new species.

An entirely black species, except for a creamy white fascia on tergites 1 to 5, similar to *S. interrupta* Cresson, but a little larger, with wings uni-



formly dusky and hair of vertex and notum white, intermixed with long black hairs (hair on these parts black and sparse in *interrupta*). *S. interrupta* was very briefly described and a comparison with the type will be necessary to show whether *depressa* has other and more substantial differences.

FEMALE.—Form robust. Black, but tergites 1 to 5 each with a narrow, creamy white fascia, not quite reaching the lateral margins. Each fascia moderately widely interrupted medially and those on 3 and 4 interrupted sublaterally. Fascia on 1 and 2 emarginate behind on each side, the width of the emargination about equaling the width of the medial interruptions and also the lateral interruptions on following segments. Median pair of white marks on tergites 3 to 5 becoming shorter on each successive segment, those on the fifth being the sole remnants of the fascia of that segment. Wings strongly dusky, the nervures black. Head barely wider than long and not quite equaling width of thorax. Clypeus depressed, the apex broadly truncate, the margin finely toothed. Mandibles tridentate, the two inner teeth equal, well separated and much smaller than apical tooth. Labrum about one and one-half times longer than wide and broadly truncate at apex. Tubercles obscurely carinate on anterior margin. Propodeum sharply declivous, the pitted basal groove obliterated except far to the sides, as usual in *Chelynia*. Abdomen ovate, convex at base and strongly depressed toward apex. Tergite 6 much broader than long, rounded at apex, but not evenly, as there is a slight inward curve on each side. Ventrite 6 distinctly but not greatly exceeding the tergum, subangular at apex, the angle distinctly greater than a right angle. Exposed dorsal lip of ventrite 6 narrow, finely and densely pubescent except on inner margin. Head and thorax closely and moderately finely punctured, the punctures dense on frons, and finer and dense on clypeus. Punctures of mesoscutum mostly less than a puncture width apart, those of the mesopleura no sparser except just above the middle coxæ. Upper portion of metapleura and sides of propodeum with finer, shallow, crowded punctures. Propodeum with a large polished bowl-shaped area, otherwise closely punctured, and finely punctured and dull across the base between the lateral pits. Abdomen more shining, closely and considerably more finely punctured than mesoscutum. Venter dullish, finely and densely punctured. Pubescence white, long and rather dense on face, cheeks and pleura, and much shorter and thinner on mesonotum except around the margins. Face, vertex and mesonotum with numerous long erect fuscous or black hairs intermixed, the cheeks with a few similar hairs. Abdomen with very fine appressed pale pubescence and short erect black hairs, which are numerous on apical tergite and become gradually sparser on successive segments toward the base. Venter with rather dense, fine pubescence, forming a very short fringe at apex of segments. Length, 7 mm.; anterior wing, 5.5 mm.; width of abdomen, 2.6 mm.

MALE.—Similar to female. Fascia on tergites 2 to 5 usually interrupted sublaterally as well as medially, tergite 5 having a small spot on each side, that is always absent in the female. Venter shining, the second segment



with minute, not very close punctures. Disk of ventrite 3 with a broad concave depression in the middle, the apical protuberance in the form of a small tooth. Apical comb on ventrite 4 narrow, with a raised margin on the disk just above and before it. Ventrite 5 with a broad angular emargination and a deep broad impression medially. Ventrite 6 with a much narrower median impression or furrow. Pubescence whitish, intermixed with fuscous hairs on frons, vertex and mesonotum, and a few dark hairs along inner orbits. Hair of abdomen sparse and mainly black, except on first tergite. Second ventrite without an apical fringe. Apical fringe of ventrites 3 and 4 dense but abbreviated, pale fulvous and interrupted on 4 by the comb. Length, 6.5 mm.; anterior wing, 5 mm.; width of abdomen, 2.7 mm.

The female varies from 6.5 to 7.5 mm. and the male from 6 to 7 mm. in length. The fasciæ on tergites 2 and 3 may be emarginate behind or broken sublaterally in the female. In the male the fascia on tergite 1 is emarginate behind on each side, that on 2 either broken or emarginate sublaterally, and those on following segments interrupted sublaterally, except on one side of 3 in one specimen.

Holotype female, allotype, three male and three female paratypes, on flowers of *Cryptantha micrantha*, var. *lepida*, Santa Rosa Peak, 7500 feet, Santa Rosa Mountains, California, June 8, 1940 (Timberlake and Michener); and one female (paratype), 2 miles north of Palm Springs, on *Hyptis emoryi*, March 7, 1936 (Timberlake). Four paratypes have been returned to Mr. Michener.

**Stelis (Chelynia) linsleyi** new species.

Allied to *S. subemarginata* and *S. monticola* of Cresson. It differs from *subemarginata* in having thorax and abdomen shining, with punctures well separated, the abdominal bands pale yellow, rather broad, strongly and moderately broadly emarginate behind on each side. From *monticola* it differs in the elongate, somewhat tapering abdomen and in the broad abdominal fasciæ.

FEMALE.—Thorax robust, appearing unusually broad through the mesopleura, on account of the much narrower head and abdomen. Black, except for a broad, pale yellow band on tergites 1 to 5. Band on tergites 1 and 2 constricted at the middle, those on 3 to 5 narrowly interrupted medially, and all moderately broadly and distinctly emarginate on each side behind. Band on tergite 1 and 2 distinctly broadened at outer ends, and the inner ends of the halves on 5 much broader than the outer ends. Claws red, and a small red area on mandibles just before the apex. Tibial spurs, tegulæ and antennæ dark. Wings strongly and nearly uniformly dusky, the venation blackish. Clypeus convex, finely and densely punctured, its margin broadly truncate, finely crenulated. Frons, vertex and cheeks finely and very closely punctured. Punctures of mesoscutum slightly coarser than those of frons and much sparser, mostly about one to two puncture widths apart. Punctures of scutellum distinctly coarser and closer than those of scutum.



Mesopleura closely punctured like cheeks. Propodeum finely and closely punctured except enclosure, which is more shiny and in the form of a short-stemmed Y, with flaring arms. Tegulae large, shining, finely and moderately closely punctured. Abdomen elongate, rather slender and tapering, much longer than head and thorax together, broadest across the first segment and strongly convex above toward base. Tergites shining, finely punctured, the punctures mostly about one to two puncture widths apart, and considerably sparser on the pale fasciae. Apical tergite large, almost as long as broad, rounded at apex, its disk gently convex, becoming depressed at apex, its puncturation similar to that of preceding segments, but becoming finer, obscure and crowded on apical border. Venter finely, very closely and uniformly punctured. Apical ventrite subangular at apex, slightly produced beyond tergum, so that the apical lip is exposed, which is densely covered with fine pile. Pubescence whitish, rather dense on face, cheeks and pleura, and short, sparser and mostly appressed on vertex and mesonotum. Hair of legs very short and whitish, becoming pale ferruginous brown on inner side of tarsi. Hair of abdomen mostly pale brownish, fine, short, mostly appressed, with a few somewhat longer erect hairs along the sides and at apex. Venter with fine appressed very short pubescence, which is much denser than that of tergum. Length, 10 mm.; anterior wing, 6.5 mm.; length of abdomen, 6.5 mm.; width of abdomen at base, 2.5 mm.

One female (holotype), Idyllwild, San Jacinto Mts., California, June 4, 1939 (E. G. Linsley), in the collection of Dr. Linsley.

**Stelis (Stelidina) trichopyga** new species.

Allied to *S. hemirhoda* Linsley but larger, the abdomen much less red, the apical ventrite broadly rounded at apex, with a little nipple-like median lobe, the disk of apical tergites with coarse erect reddish hairs, apical margin of last segment with a short dense fringe, and maculations of abdomen more yellowish.

FEMALE.—Head and thorax black, without maculations, except that the tubercles are rufo-testaceous. Tegulae bright ferruginous. Labrum reddish on lateral margins. Mandibles black at base, rufo-testaceous in middle and piceous at apex. Antennae black, the flagellum slightly brownish. Legs black, the knees, apex of tibiae, apex of tarsal joints and claws red, the base of tibiae with a small yellowish spot. Spurs testaceous. Abdomen black, considerably reddened on margins of tergites, especially on basal segments. Depressed apical margin of tergites rufo-testaceous, becoming red on each side. Apex of tergite 6 narrowly red. Tergites 1 to 3 each with a narrow pale yellow subapical fascia, slightly narrowed medially in front on 2 and 3, subinterrupted far to each side by red on 1 and interrupted by red and black on 2 and 3. Tergites 4 and 5 with only the median portion of the fascia, which is much abbreviated on 5 and more broadly constricted medially in front on 4 than on the preceding segments. Ventral segments broadly rufo-testaceous at apex, becoming more reddish at sides, the black band at base of ventrites 2 and 3 not reaching the lateral margins. Ventrite 1 en-



tirely red and ventrite 6 entirely black. On the tergum the margins between the black and yellow markings suffused with red. Wings strongly and almost uniformly infuscated. Nervures blackish. Head broader than long and as broad as thorax. Inner orbits strongly converging below. Mandibles tridentate, the outer tooth largest. Tubercles flattened at apex, but not especially sharp-edged anteriorly. Margins of axillæ and scutellum continuous, the scutellum slightly angulated at apex. Metanotum and face of propodeum sharply declivous, the propodeum without a pitted impression at base. Abdomen broad, subdepressed. Tergite 6 broader than long and broadly rounded at apex. Apical ventrite slightly exceeding the tergum, broadly rounded at apex and with a small nipple-like lobe in the middle. Head and thorax moderately shiny, finely and closely punctured. Punctures of frons and vertex dense, those of clypeus finer and slightly separated. Punctures of mesoscutum less than a puncture width apart, those of mesopleura a little coarser and sparser. Sides of propodeum more obscurely punctured, the punctures very fine and dense. Bowl-shaped area of propodeum shining, impunctate, except that it is finely, shallowly punctured on the basal margin. Tegulæ minutely and sparsely punctured. Abdomen closely punctured, the punctures slightly finer than those of mesoscutum. Apical ventrite minutely and densely punctured. Pubescence of head and thorax white, subappressed, moderately long, thinner than in *hemirhoda*, but moderately dense on face. Hair of vertex and mesonotum much shorter, slightly tinged with dull ochraceous. Pubescence of abdomen fine and short, the hairs becoming more plumose and whiter on apical segments. Apical margin of segments 1 to 5, both dorsally and ventrally, with a short, rather dense fringe of white plumose hair, very broadly interrupted in middle on tergites 1 and 2 and also more or less on 3. Disk of tergites 3 to 6 with many long coarse suberect reddish hairs, most abundant apically, and becoming shorter and sparser on the more basal segments. Apex of tergite 6 and ventrite 6 densely fringed with fine, simple, pale brownish ochraceous hair, which is about twice as long as the small median lobe of the ventrite. Length, 5 mm.; anterior wing, 3.9 mm.; width of abdomen, about 1.9 mm.

One female (holotype), flying over ground, Riverside, California, May 7, 1937 (Timberlake), and one female (paratype), flying over ground, the Gavilan, Riverside County, April 18, 1940 (Timberlake).

This species and the one following belong to the group recently treated by Linsley (1939, Ent. News, 50, p. 250-255). This group I propose to treat as new subgenus of *Stelis* under the name *Stelidina*, with *Stelis hemirhoda* Linsley as the genotype. *Stelidina* differs from *Stelidium* Robertson in having no pale maculations on the head and thorax, except that the tubercles may be rufo-testaceous, and in having the tegulæ bright ferruginous, without a white spot, and base of propodeum with only a trace of a pitted transverse impression. From *Chelynia* Provancher the species



of *Stelidina* differ in their small size, although the form is robust, and in having the hind basitarsi not much thickened. *Chelynia* always has the head and thorax immaculate, but the tegulæ are never ferruginous. Although *Stelidina* has not much structural basis to distinguish it from *Chelynia* and *Stelidium*, it forms, however, a compact, easily recognizable group, and probably has had a somewhat different phylogeny.

**Stelis (Stelidina) nigriventris** new species.

This is even more similar to *S. hemirhoda* than is *S. trichopyga*, but differs in having the abdomen black, with apical margin of tergites testaceous, the white fasciæ thrice interrupted on tergites 2 to 5 and interrupted on middle of 1. Tergite 6 also has two apical white spots. The apical white fringe of the tergites is lacking except laterally on the basal segments, although possibly worn off in the type, and ventrite 6 is more broadly and evenly rounded at apex.

FEMALE.—Black. Mandibles broadly rufo-testaceous in middle. Flagellum brown beneath. Tegulæ clear pale ferruginous. Extreme apex of femora and tibiæ on outer side, and apex of tarsal joints, rufous. Spurs pale yellow-testaceous. Depressed apical border of tergites 1 to 5 and a corresponding apical band on ventrites 1 to 5, testaceous, becoming rufo-testaceous on lateral margins of abdomen. Tergites 1 to 5 with a subapical yellowish-white fascia, interrupted medially (rather broadly on 2 and 3) and also laterally on 2 to 5. Fascia on 1 broadened toward the sides and deeply emarginate behind sublaterally. The four white marks on tergites 2 and 3 subequal. Lateral spots on 4 and 5 smaller than the submedian marks. Tergite 6 with a pair of small roundish yellowish-white spots close to the median line and apex. Wings dusky, nervures black. Head as broad as thorax and slightly broader than long. Inner orbits converging below. Apical tooth of mandible slightly larger than other two. Margin of axillæ and scutellum forming a broad curve. Metanotum and propodeum sharply declivous beneath apex of scutellum. Base of propodeum shining, with three or four short longitudinal carinæ on each side, and the middle broadly dulled by fine close striate punctures. Abdomen subovate, convex above. Tergite 6 rounded at apex. Ventrite 6 not exceeding the tergum and broadly and evenly rounded at apex. Head and thorax moderately shining, finely and closely punctured, the punctures a little coarser on frons, vertex and mesopleura, and finer and sparser on sides of propodeum. Propodeum with a large polished bowl-shaped area. Abdomen finely and closely punctured, the punctures nearly uniform on tergum, and becoming increasingly finer and denser on apical ventrites. Pubescence of head and thorax white, moderately long, subdepressed, and thickest on the face, cheeks, mesopleura and apex of scutellum. Disk of mesoscutum and the venter with short, thin hair. Abdomen with very short fine pale pubescence. Apical white fringe of tergites lacking except laterally on first two segments. Apical margin



of the tergite and ventrite of segment 6 with fine dense simple hairs, forming a very short fringe. Apex of marginal cell more pointed than in *hemirhoda* and less receding from the margin. Second recurrent nervure also received closer to apex of second submarginal cell. Length, 4.75 mm.; anterior wing, 3.3 mm.; width of abdomen, 1.2 mm.

One female (holotype), collected 10 miles south of Adelanto, San Bernardino County, California, May 3, 1939 (Timberlake). It was flying about a small stick on the ground.

**Stelis (Stelidium) ashmeadiellæ** new species.

This and the two following species differ from *Stelidiella* in having pale markings on the head and thorax, ocelli usually much smaller, and base of propodeum with a narrow, transverse, pitted groove. *S. ashmeadiellæ* may be known from the other species of *Stelidium* by having two or three yellowish-white marks on the clypeus.

FEMALE.—Black, with creamy white markings as follows: A large oval oblique mark on each side of clypeus; stripe on inner orbits much dilated below next to the clypeus; transverse band on occipital margin of vertex, widened behind summit of eyes, otherwise narrow and sub-interrupted medially; large oval mark on each side of anterior margin of mesoscutum, and a short line on each lateral margin opposite tegulæ; spot on axillæ and line on apical margin of scutellum on each side; tubercles and large semicircular mark on tegulæ; spot at base of all tibiæ; subapical fascia on tergites 1 to 5, and two subapical dots on tergite 6. The white fasciæ of abdomen almost reaching lateral margins, all emarginate anteriorly on each side, and decreasing in width on successive segments caudad. Emarginations of fascia of tergite 1 deep and rounded, those of following segments becoming successively broader and shallower, those on tergites 4 and 5 being as broad as, or broader than, the median portion of fascia. Mandibles reddish, the base broadly suffused with black and the apical teeth black. Flagellum slightly reddened beneath. The central boss and inner margin of tegulæ reddish-piceous, the extreme outer margins testaceous. Joints 3 and 4 of tarsi and apex of joints 1 and 2 dark reddish. Spurs yellow-testaceous. Very narrow apical depression of tergites 1 to 5 testaceous. Wings dusky hyaline, the nervures blackish. Head as broad as long and about equaling thorax. Clypeus finely denticulate apically. Apical tooth of mandible much larger than the other two teeth. Ocelli small. Tubercles inconspicuously carinate in front. Axillæ much more discrete than in species of *Stelidiella*, but continuous on outer margin with the scutellum, which is rounded at apex. Propodeum sharply declivous, the basal groove distinct, narrow and divided into small pits by carinate plicæ. Abdomen elongate-ovate, subconical, strongly convex above. Apical tergite depressed and flattened on apical third, and rounded at apex. Sixth ventrite distinctly produced beyond apex of tergum and narrowed to a rather broad subtruncate apex, which is very slightly notched medially. Head and thorax closely and rather finely punctured. Punctures of clypeus finer and dense, those of mesoscutum and mesopleura



coarser than elsewhere and a little more separated. Labrum with a triangular impunctate space on basal half. Abdomen about as finely and closely punctured as frons. Dorsal exposed lip of ventrite 6 minutely densely punctured at base and polished around the margin. Pubescence pale brown or brownish-ochreous on vertex and mesonotum, paler on remainder of face and whitish on cheeks and pleura. Hair thin and rather short, becoming longer and denser on middle of face, cheeks, pleura, apex of scutellum, and in a tuft behind base of hind wings. Hair of abdomen short, thin and depressed, the apex of the tergites with a very weak fringe. Ventrite 1 with long whitish hair. Ventrites 2 to 5 with an apical fringe, which is long, rather thin and pale ochreous on 2 and becomes successively shorter, denser and browner on following segments. Length, 5.5 mm.; anterior wing, 3.7 mm.; width of abdomen, 1.8 mm.

Paratype female (Santa Monica).—Larger. Clypeus with three white marks conjoined anteriorly, leaving the base black with two forward directed prongs. Band on vertex less narrowed in middle and entire. Tergite 6 more sparsely punctured at base. Its disk depressed throughout, with the outline in profile straight from base to apex. Two white spots on tergite 6 much larger. Length, 6.5 mm.; anterior wing, 4.3 mm.; width of abdomen, 2.3 mm. Another female (West Los Angeles) is more similar to type, except that the clypeus is marked as in the Santa Monica specimen. Band on vertex more broadly interrupted than in type. Spot at base of hind tibia reaching to the middle.

MALE.—Similar to female but smaller. Clypeus with a broad trilobed white band as in paratype female, except that the median lobe extends no further basad than the other two. Band on vertex broadly interrupted in middle. Anterior emarginations of the abdominal fasciæ subequal from one segment to the next. Puncturation similar. Pubescence pale ochraceous on face and mesonotum and not appreciably denser on the pleura than on the notum. Disk of first three ventrites with moderately short and abundant pale ochreous plumose hair. Ventrites 2 to 4 with an apical pale fringe, slightly shorter and broadly interrupted on the middle of 4. The middle of apical margin of ventrite 4 occupied by a shining black arcuate corneous structure, with a broad raised margin. Length, 5 mm.; anterior wing, 3.5 mm.; width of abdomen, 1.6 mm.

One female (holotype) reared from nest of *Ashmeadiella californica* (Ashm.) in a pithy weed stem, collected in the Puente Hills, near Whittier, California, Feb. 25, 1928, and found issued and dead on May 12 (Timberlake); one female (paratype), Santa Monica, June 30, 1935 (E. G. Linsley); one female (paratype), West Los Angeles, July 14, 1930 (C. H. Michener); one male (allotype), Riverside, on *Gutierrezia californica*, May 26, 1928 (Timberlake).

The paratype females are in the collections of Messrs. Linsley and Michener.

***Stelis (Stelidium) palmarum* new species.**

This differs from allies in having labrum and tegulae ferruginous, the apex



of clypeus red, tergite 6 with suberect bristle-like red hairs and ventrite 6 rather small, but shortly exceeding the tergum, and acute at apex.

FEMALE.—Black, marked with creamy white as follows: Stripe on inner orbits, reaching middle of frons and gradually widened below; transverse elongate mark behind each eye, widely separated from its fellow; two transverse spots on anterior margin of mesoscutum; small spot on lateral margin of axilla and scutellum on each side; spot at anterior end of tegulae and spot on tubercles; short line at base of all tibiae; and fascia on tergites 1 to 5. Abdominal fasciae subapical, almost reaching to lateral margins, that on tergite 1 roundly and deeply emarginate in front on each side, with mouth of emargination much constricted. Emargination of following fasciae successively broader, and quite or almost breaking through, with the lateral more or less isolated spot becoming successively smaller. Median portion of fascia on tergites 2 to 4 narrowed in middle. Fascia on 5 represented by only a short narrow line on middle of disk. Narrow depressed apical margin of tergites 1 to 5 testaceous, that of 6 dark red. Ventrites 2 to 5 with a narrow subapical rufo-testaceous band. Ventrite 6 dark red, dusky at base. Mandibles with a dark red band before apex. Apical margin of clypeus red. Labrum reddish-ferruginous. Tegulae bright ferruginous. Flagellum dark reddish. Apex of femora and tibiae narrowly, and tarsi in large part, except most of hind basitarsi, dark red. Wings slightly infuscated, slightly darker in marginal cell. Head as broad as long and equaling thorax in width. Ocelli about as large as in *S. hemirhoda*. Inner orbits converging below. Two inner teeth of mandible much smaller than apical tooth. Tubercles with a testaceous carinate margin. Axillae subdiscrete and continuous with margin of scutellum, the latter subacutely rounded at apex. Propodeum sharply declivous, with a narrow, pitted groove at base. Abdomen ovate, convex. Tergite 6 convex, rounded and with a smooth narrow depressed marginal lip at apex. Ventrite 6 rather small, triangular, with apex a little blunt and shortly produced beyond tergum. Head and thorax rather finely and closely punctured, the punctures finer and closer on clypeus and sides of propodeum. Truncation of propodeum mainly polished, with a few scattered punctures, mainly toward the sides. Puncturation of abdomen similar to that of mesonotum, but becoming successively finer on apical ventrites, that on the last extremely fine and dense. Pubescence white, rather thin and short, becoming a little denser on middle of face, cheeks, pleura and apex of scutellum. Basal tergites with a thin apical fringe on each side. Ventrites 2 to 5 with a rather dense, white, apical fringe, long on 2 and much shorter and denser on 5. Disk of ventrite 6 and exposed dorsal surface of its lip dull and densely covered with an extremely fine short pale pile. Sides of the tergum with rather long, sparse, erect, pale hairs, those on apical part of tergite 6 more bristly and red. Length, 5 mm.; anterior wing (badly frayed), about 3.6 mm.; width of abdomen, 1.9 mm.

One female (holotype) collected at Andreas Canyon, near Palm Springs, California, on *Cryptantha intermedia*, April 23, 1933 (Timberlake).



**Stelis (Stelidium) robertsoni** new species.

Distinguishable from *S. ashmeadiellæ* by having the clypeus immaculate and the abdomen more conical toward apex, with the exposed lip of the last ventrite very broad. From *S. palmarum* it differs in the conical abdomen, with the last ventrite strongly produced. Without much doubt it is closely related to *S. trypetina* (Robt.) and *S. permaculata* Ckll., but differs in having white spots on mesoscutum, axillæ, tegulæ, tubercles and base of tibiæ.

FEMALE.—Black, with creamy white markings as follows: Line on inner orbits, reaching middle of frons and rather abruptly dilated below; short line behind summit of each eye; dot on each side of anterior margin of mesoscutum; dot on each axilla; spot at anterior end of tegulæ and at apex of of tubercles; dot at base of four anterior tibiæ and a more elongate spot at base of hind pair; four subapical marks on each of tergites 1 to 3, and a small subapical spot far laterad on each side of tergite 4. Tegulæ and labrum ferruginous. Mandibles strongly reddened, black at apex and suffused with black at base. Flagellum reddened beneath. Extreme apex of femora and of basal joint of tarsi, and small joints of tarsi, dark red. Spurs pale testaceous. Narrow depressed apical margin of tergites slightly testaceous. Ventrite 6 strongly reddened at sides and broadly at apex, the exposed dorsal lip rufo-testaceous. Wings dusky hyaline, the infuscation slightly deeper on costal margin of apical half of wing. Head as broad as long and nearly equaling width of thorax. Mandibles tridentate, the two inner teeth small and equal. A small fovea on sutural margin of clypeus on each side above (not noticed in allied species). Ocelli very small. Tubercles slightly carinate on anterior margin. Axillæ continuous with margin of scutellum, which is rounded at apex. Propodeum sharply declivous, the base with a well developed narrow pitted groove. Abdomen conic-ovate, convex above. Tergite 6 depressed on disk, subacutely rounded at apex. Ventrite 6 strongly produced, somewhat narrowed to the rather broad subtruncate apex, which is very slightly emarginate in middle. Exposed dorsal lip of ventrite 6 about twice as broad as in *S. ashmeadiellæ*.\* Head and thorax moderately finely and closely punctured, the punctures finer on cheeks and sides of propodeum and sparser on mesopleura. Clypeus minutely and densely punctured. Labrum densely and finely punctured except in a depressed polished triangular area on basal half. Posterior face of propodeum polished, with a few scattered punctures laterally. Abdomen punctured much like the mesonotum, the punctures a little sparser on last two tergites. Last two ventrites much more finely and rather densely punctured, the punc-

\* Cockerell in his report on the type of *S. ontariana* Sladen (1922, Can. Ent., 54, p. 143) complains that he is unable to find the subapical carina of the last ventral segment, which was stated by Robertson to be present in *S. trypetina*. Dr. Cockerell searched for this carina on the ventral surface, whereas the carina, that Robertson had in mind, is evidently on the exposed dorsal surface of the sclerite and constitutes the basal boundary of what is called the dorsal lip in this paper.



tures disappearing on apical margin of the sixth. Pubescence whitish, rather thin and moderately long, not appreciably denser on pleura than on notum of thorax, but distinctly denser on middle of face than on vertex. Hair of clypeus rather dense, subappressed, but not concealing surface, becoming brownish-ochreous on anterior border. Hair of abdomen short, thin, subappressed, with a thin apical fringe on sides of first two tergites. Ventrite 1 densely hairy at apex. Ventrites 2 to 5 each with an apical fringe, rather thin and long on 2 and successively shorter and denser on following segments. Length, about 5.5 mm.; anterior wing, 3.5 mm.; width of abdomen at base, 1.7 mm.

Paratype female.—Differing from holotype in having labrum and tegulae piceous, the former reddened laterally and at apex. Ventrite 6 entirely dark. Length, 6 mm.; anterior wing, 3.6 mm.; width of abdomen, 1.8 mm.

MALE.—Similar to female. Tergites 1 to 3 each with four spots, 4 usually with four, sometimes with only the two median spots. Tergite 5 either entirely black, or with two or even four small spots. In one male the two median spots are enlarged on 2 and 3, even coalescing on 2 and narrowly separated on 3 (the same specimen has four spots on tergite 5). Tegulae ferruginous, or dusky ferruginous. Labrum dark. Venter with apical fringes and shining black corneous structure on middle of apical margin of segment 4 much as in *S. ashmeadiellæ*. Length, about 4.5–5 mm.; anterior wing, 3.3–3.7 mm.; width of abdomen, 1.5–1.6 mm.

Described from a small series collected at Riverside, California, by the writer: One female (holotype), May 28, 1925, on *Eschscholtzia californica*; one female (paratype), May 27, 1932, on *Eriogonum fasciculatum*; two males (allotype and paratype) on *Gutierrezia californica*, May 27 and 29, 1925; and two males (paratypes) in 1934, one on *Encelia farinosa*, April 25, the other on *Cryptantha intermedia*, May 2.

This species is named in memory of Charles Robertson, noted for his work on the anthophilous insects of southern Illinois.





Timberlake, P. H. 1941. "Ten New Species of Stelis from California (Hymenoptera, Apoidea)." *Journal of the New York Entomological Society* 49, 123–137.

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