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RECORDS OF WESTERN SPECIES OF PERDITA WITH DESCRIPTIONS OF TWO NEW SPECIES (HYMENOPTERA)

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No species of Penurgid bees of the genus *Perdita* have been recorded from the Pacific Northwest except *P. albipennis* Cresson from the State of Washington, and even *albipennis* has been considered an adventive species that had followed the sunflower in its western dispersion. It is interesting, therefore, to note the occurrence of two species in Oregon and another from Vancouver Island, British Columbia. The Oregon species were found east of the Cascades in a region where the fauna is distinctly of a desert type much like that of Nevada. Dr. Cockerell has recorded many species of bees from this fauna even as far north as Pasco, Washington. The Vancouver *Perdita*, however, belongs distinctly to another fauna that has been developed in the more humid region of the Pacific Coast.

1. PERDITA ZEBRATA Cresson

Two females and one male, collected June 30, 1927, at Nixon, Nevada (E. P. Van Duzee). These have the pale markings bright yellow, but the male genitalia agree exactly with typical *zebrata* from Colorado and New Mexico.

2. PERDITA ZONALIS Cresson

Three females and five males, collected August 10, 1926, at Sisters, Oregon; and one male, collected August 11, 1926, at White Branch Meadow, Three Sisters, Oregon, 5675 feet (H. A. Scullen).

These specimens I am unable to separate satisfactorily from the little known *P. zonalis* Cress., although they may ultimately prove to be separable when *zonalis* becomes better known. The females agree well with the original description and with

Cockerell's notes on one of the types, except that the first tergite of abdomen has a continuous dark band across the middle instead of a small black spot on each side. I had thought, after reading what has been published about *zonalis*, that the wings were colored as in *P. zebrata* Cress., that is, more or less milky hyaline with very pale veins. Having recently seen the types at Philadelphia I can affirm, however, that the wings are slightly tinted with fuscous with the veins distinctly brownish.

The male, previously unknown, runs to *P. zebrata* Cress. in Cockerell's table (1896) and is easily distinguished from that species by the darker wings and veins, the much evener banding of abdomen and by having the hind femora yellow with only a small dark spot above at apex.

Male. General form as in other species of the *zebrata* group. Head not enlarged, somewhat wider than thorax, slightly wider than long and well rounded on the sides and above. Cheeks narrow and simple. Eyes about twice as long as wide, a little wider toward lower end than above, and with the inner orbits very slightly converging below. Clypeus moderately convex and projecting for about one-half of its length in front of ocular line; the disk about one-half wider than high, with its dorsal margin rather broadly transverse between dog-ear plates; the lateral extensions short, very broad, well inflexed anteriorly and approximately one-half visible in frontal view of head. Dog-ear plates about twice as long as wide and rather acute at lower end. Supraclypeal plate as long as broad, slightly narrowed above, where it ends between the antennal sockets in a sharp declivity toward the frons. The declivity strongly tectiform and somewhat carinate medially as it approaches surface of frons on to which it intrudes only for a short distance. Frons with a distinct, impressed, shining, median line reaching to, or nearly to, tectiform declivity and becoming more evident close to the median ocellus. Lateral plates of face rather strongly widened at lower end, and opposite middle of dog-ear plates, each covering slightly less than one-fourth the total width of face. Mandibles curved, tapering, simple and acute at apex and reaching to far margin of labrum. Abdomen oval, convex, about twice as long as broad and with the apex moderately reflexed toward venter. Seventh tergite broadly rounded at apex. Membrane of wings rather densely covered, especially in apical field, with very fine short setæ. Stigma narrowly lanceolate, a little shorter than first submarginal cell and emitting radius distinctly beyond the middle. Marginal cell considerably wider and somewhat shorter than stigma, with the apical truncation more or less oblique and the poststigmatal and substigmatal parts about equal. Second submarginal cell narrowed one-half to two-

thirds above. Recurrent veins interstitial with the intercubitali. Subdiscoidal vein and second recurrent, except a short spur above, obsolete. Claws rather large, strongly bent, cleft and with the inner tooth a little thicker and considerably shorter than outer tooth.

Frons very finely granular tessellate, subopaque, with obscure, minute, sparse punctures. Vertex similarly sculptured but a little less dull and impunctate. Face below antennæ smooth, shining and sparsely and finely punctured. Cheeks tessellate, shining and rather closely punctured except in a smooth strip along orbits. Thorax polished and shining, but disk of propodeum distinctly tessellate. Punctures of mesonotum fine and very sparse, and those of mesopleura similar and much closer. Abdomen with the usual microscopic lineolate sculpture. Pubescence whitish and fine; dense and moderately long on cheeks, similar but thinner on occiput, pleura and sides of propodeum, and rather sparse and shorter on mesonotum and face.

Head and thorax dark bluish green, with the frons and vertex greener and the propodeum dark blue. Mandibles except reddish tips, labrum, and face below antennæ, except dog-ear plates, bright yellow. Dog-ear plates black with a small yellow spot above, or sometimes almost all yellow except around the margins. Lateral marks of face obliquely truncate above about from the middle of outer margin of antennal sockets to a point on orbits just below the foveæ. Cheeks narrowly margined with yellow anteriorly, on margin of gular cavity for a short distance and along posterior orbits nearly to middle of eyes. Prothorax mainly dark, but tubercles, and frequently narrow anterior margin and a small spot at posterior corners of notum, yellow. Thorax otherwise entirely dark. Abdomen bright yellow, with the venter nearly or quite immaculate and the seventh tergite rather brownish yellow. First tergite black, but often with a small yellow spot on each side subapically that joins laterally with a thin marginal yellow line running toward the base. Basal band on second tergite, mostly covered by preceding segment but triangularly enlarged on each side to cover the lateral foveæ, a rather broad band at juncture of tergites 2-3 to 5-6, and broad band on apical margin of six piceous, or varying to brownish on apical segments. Dark bands on tergites 2 to 4 slightly bulging anteriorly just before the end on each side. Yellow intervals about as wide as the dark bands, reaching to lateral margins but more or less constricted laterally on tergites 2 to 4. More rarely the yellow interval on two is reduced to a narrow basal band entirely enclosed and ending far from lateral margins, and those on three and four at the same time more or less nibulously cut off at lateral margins. Legs bright yellow, the front and middle tarsi paler, a large blotch above and behind on front and middle femora and tibiæ, a spot at apex of hind femora above, hind tibiæ except beneath and hind tarsi, except under side of basitarsus, brownish fuscous. Labio-maxillary structure piceous but the

maxillary blades, maxillary palpi and the glossa more or less testaceous. Antennæ fuscous or dark brown, becoming paler toward apex, the scape except a spot above at apex and pedicel beneath bright yellow, and the flagellum rather broadly dull yellowish beneath, except last joint which is nearly all brown. Tegulæ hyaline with a yellow spot at base. Wings hyaline but just perceptibly tinted with fuscous; veins and margins of stigma rather pale brown, subcosta much darker and the stigma otherwise pallid.

Length about 4.25 to 5.0 mm.

3. *Perdita oregonensis* Timberlake, new species

Two males (holotype and paratype), collected August 10, 1926, at Sisters, Oregon (H. A. Scullen).

The male runs to couplet 42 in Cockerell's table (1896), and among other species since described that run to the same place, it is very similar and closely allied to *P. stottleri* Ckll. It differs from *stottleri* in having the head much wider (considerably wider than long, but in *stottleri* about as wide as long), the white pubescence of head and thorax somewhat longer, denser and more conspicuous, the frons less densely sculptured and more shining, the mesonotum less distinctly tessellate and more shining, and in having one more dark band on abdomen. These distinctions are rather weak, but there are also differences in the genitalia which indicate two distinct species, although the genitalia show that the two are very closely allied.

Male. General form of body as in other species of the *zebrata* group. Head not enlarged, but wider than thorax, considerably wider than long, well rounded on sides and gently rounded above. Cheeks rather narrow and simple. Eyes about twice as long as wide, broader toward lower end than above and having the inner orbits very slightly converging below. Clypeus convex and only slightly projecting beyond ocular line; the disk about one-half broader than high, rather well rounded above but subtransverse medially between dog-ear plates; the lateral extensions very broad and well inflexed anteriorly but still visible in large part in frontal view of head. Dog-ear plates about one-half longer than wide and obliquely truncate at lower end. Supraclypeal plate about one-third wider than high, extending upward between antennal sockets and ending in a sharp declivity toward frons. This declivity extending only a short distance on to frons and rather weakly tectiform. Lateral plates of face somewhat widened at lower end and opposite middle of dog-ear plates, each covering about one-fourth the total width of face. Frons on dorsal half with a strongly impressed shining median line. Mandibles rather long, curved, tapering to simple

acute apex and reaching somewhat beyond far margin of labrum. Antennæ ordinary, the scape about twice as long as thick and the middle joints of flagellum about as long as thick. Abdomen oval, convex, about twice as long as wide, with the apex moderately reflexed toward venter. Seventh tergite with a rather narrow rounded apex. Membrane of wings rather densely covered in apical field with fine weak setæ. Stigma narrowly lanceolate, nearly as long as first submarginal cell and emitting radius somewhat beyond the middle. Marginal cell about as long as stigma, with the apical truncation slightly oblique and the substigmatal and poststigmatal parts about equal. Second submarginal cell narrowed about one-half above. First and second recurrent veins either interstitial, or very nearly so, with the intercubiti. Subdiscoidal and second recurrent veins obsolete, except a short stub of the recurrent vein above and a small section at its middle. Claws rather large, strongly bent and cleft with the inner tooth about two-thirds as long as outer tooth.

Face below antennæ smooth and obscurely punctured, the punctures of clypeus very sparse. Frons strongly and finely tessellate, moderately shining and rather closely and finely punctured. Cheeks smooth and closely punctured except in a polished strip along the orbits. Thorax polished and shining, but the propodeum rather delicately tessellate. Mesoscutum and scutellum with fine, widely spaced punctures, which become more numerous anteriorly on the scutum. Mesopleura with numerous microscopic punctures. Abdomen shining and with the usual microscopic lineolate sculpture. Pubescence white, rather abundant and conspicuous; long and rather dense on cheeks, occiput, metanotum, pleura and sides of propodeum, and somewhat shorter and considerably thinner on face and mesonotum.

Head and thorax very dark brassy green, becoming bluish on pronotum and propodeum and to a less extent on the pleura. Mandibles except reddish tips, labrum, mark on cheeks anteriorly, and entire face below level of antennæ, except the usual clypeal dots, bright yellow. Mark on cheeks rather large, broadening toward gular cavity, and continued as a thin line along orbits not quite to middle of eyes. Lateral marks of face extending along orbits not quite to level of frontal foveæ and obliquely truncate above to outer upper margin of antennal sockets, but sometimes the truncation is broken within by a rather wide extension of the green along the outer side of the antennal sockets to the level of their lower margin. Prothorax yellow with a rather broad bluish transverse band which broadens medially to cover the posterior margin of pronotum except at sides, and on each pleuron sends a slender subhyaline dark streak to the tubercle. Abdomen yellow above and beneath, with a piceous band at juncture of tergites 1-2 to 5-6. First tergite piceous with a rather narrow subapical yellow band strongly interrupted medially. The yellow and dark bands on following segments about equal in width, the dark bands having very slight sublateral bulgings anteri-

orly, especially on tergites 3 and 4, and the dark portion at base of tergites 2 and 3 triangularly widened at ends. The dark bands also, except the first, not quite reaching to lateral margins. Legs entirely bright yellow except a fuscous streak on dorsal side of hind tibiae and except that the last two or three joints of hind tarsi are slightly infuscated. Antennae yellow, the scape and pedicel beneath concolorous with face, the flagellum beneath a little duller and more brownish yellow. Pedicel and flagellum above fuscous but becoming much paler toward apex. Basal half of labium on axillæ and first joint of labial palpi fuscous, the remaining parts of the labio-maxillary structure yellowish. Tegulae whitish hyaline with a large yellow spot at base. Wings slightly milky hyaline, the veins very pale brownish yellow, with subcosta, margins of stigma and sometimes veins of marginal cell brown, the stigma otherwise pallid.

Length 4.0 mm.

Type in collection of the Oregon Agricultural Experiment Station, Corvallis, Oregon.

4. *PERDITA CROTONIS* Cockerell

Three females, Santa Fé, New Mexico, July 22, 1926 (E. C. Van Dyke), in collection of the California Academy of Sciences.

5. *Perdita nigricollis* Timberlake, new species

One female (holotype), Victoria, British Columbia, June 29, 1920 (E. C. Van Dyke).

This runs in Cockerell's table (1896) to *P. affinis* Cress., var. (couplet eighty), but is not closely allied to that species. It differs from *P. affinis* in the shining black disk of mesonotum, spiniform antero-lateral angles of disk of clypeus, head considerably broader than long, etc. It belongs to the group of *P. californica* Cress., and is most similar to another new species from San Diego, California.

Female. General form ordinary. Head considerably wider than long, gently rounded on side and subtransverse above. Cheeks moderately broad. Face below antennae gently convex. Clypeus projecting moderately in front of ocular line; the disk about one-half broader than high, moderately broadly truncate above between dog-ear plates and with the anterolateral angles strongly spiniform; the lateral extensions very broad, triangularly tapering toward base of mandibles, well inflexed along anterior margin, yet visible to a large degree in frontal view of head. Dog-ear plates hardly longer than wide. Lateral plates of face slightly widened at lower end, and opposite the middle of dog-ear plates, each covering slightly more than one-fourth the total width of face. Prominence between

antennæ rather high and sharply tectiform, with the ridge extending well on to frons and continuous above with a fine impressed median line to anterior ocellus. Frontal foveæ elongate, separated from eye margins by a space nearly equal to their own width, and extending below almost to level of lower margin of antennal sockets. Mandibles moderately stout, gently curved, blunt at apex and reaching to far margin of labrum. (In the type the mandibles are closed so that the inner tooth if present is not visible.) Antennæ ordinary, with the middle joints of flagellum as long as wide. Abdomen oval, about twice as long as wide and gently convex above. Pygidium very narrow and acute at apex. Membrane of wings in apical field with dense but extremely fine and short setæ. Stigma nearly as long as first submarginal cell, moderately narrow and emitting radius slightly beyond the middle. Marginal cell as long as stigma, with the substigmatal and poststigmatal parts about equal and the apical truncation strongly oblique and about two-thirds as long as the metacarpus. Second submarginal cell very broad below, narrowed about two-thirds above, and receiving the recurrent veins a short distance respectively from base and apex, or the first recurrent may be interstitial. Claws tapering from the thickened base, gently curved, simple and very acute at apex.

Frons and vertex strongly tessellate and rather dull, the frons with rather close fine punctures becoming much sparser above, and the vertex behind ocelli with rather numerous fine shallow punctures, which in some aspects appear elongate and sulcate. Cheeks polished, rather closely and very finely punctured, except in a narrow strip along the orbits. Face below antennæ smooth and with sparse, comparatively coarse punctures. Anterior part of mesoscutum finely tessellate and with numerous shallow sulcate punctures. Remainder of mesonotum polished and very sparsely and finely punctured. Thorax otherwise finely tessellate, the mesopleura with rather close fine punctures. Abdomen microscopically lineolato-tessellate and shining. Pubescence short, whitish and mostly erect; moderately dense on cheeks, occiput, punctured part of frons, rather sparser on mesopleura, sparse on face below antennæ and on mesonotum, the disk of latter being nearly bare, but dense and subappressed on mesosternum. Scopa of hind tibiæ sparse and moderately long, the hairs on anterior side of tibiæ somewhat longer and curved.

Head and thorax very dark green, the propodeum bluish, the mesoscutum, except anteriorly, scutellum and metanotum black. Mandibles except reddish piceous tips, most of clypeus, lateral and supraclypeal marks pale yellow. Labrum, anterior margin of clypeus, and two somewhat curved submedian vittæ on disk of clypeus, continuous with dark anterior margin but not quite reaching to dorsal margin, piceous. Lateral face marks large, about as broad as high, strongly rounded toward clypeus and extending along orbits to lower end of frontal foveæ. Supraclypeal mark strongly trans-

verse. Dog-ear plates and prominence between antennæ black. Thorax entirely dark except the pale yellow tubercles. Abdomen piceous, the first tergite with a very slight metallic green luster. Tergites one to five each with a marginal yellow spot on each side, the spots very small on one, two and five, subapical on one, contiguous to posterior end of lateral foveæ on two, and nearly concealed by preceding segment on five, those on three and four much larger but separated by one-half the width of segment and composed of a quadrate portion on the lateral margin at middle of segment and a lobe from inner half of anterior margin of quadrate portion, that projects obliquely forward and mesad to base of segment and is also somewhat curved. Pygidium brownish piceous. Venter entirely dark except the whitish hyaline margins of segments. Legs piceous, a spot at apex of front and middle femora anteriorly, front tibiæ anteriorly, and a streak on anterior side of middle tibiæ yellow, the front tarsi pale brown, and the middle tarsi brownish at apex. Labio-maxillary structure piceous. Antennæ piceous, the apical joint brownish and the flagellum dull brownish yellow beneath. Tegulæ testaceous, subhyaline with a yellow spot at base anteriorly. Wings hyaline, slightly tinted with fuscous, the veins and margins of stigma fuscous, the subcosta piceous, and the stigma otherwise pale.

Length about 5.0 mm.

Type female, No. 2615, Museum California Academy of Sciences.

6. *PERDITA ALBIPENNIS* Cresson

Three females, collected July 23, 1924, at Mesa, Arizona (E. P. Van Duzee).

A STATE BUTTERFLY

On another page Mr. Gunder tells us of the selection of a state butterfly for California. The motive leading to the selection of a state butterfly was the hope that it may help to arouse a more general interest in the study of entomology and thus to place this branch of zoölogy on a par with certain of the more popular branches such as ornithology and botany. Butterflies are the most beautiful and showy of all insects. They make the strongest appeal to the general public and undoubtedly are most suitable for arousing an interest in, and attracting the attention of the public to the work being done by our entomologists for the public welfare, work that is of the highest importance to the human race but that has only begun to receive the attention it deserves. Any little gesture such as the selection of a state butterfly, insofar as it serves to attract the interest of the public, is well worth while.—E. P. Van Duzee.