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Descriptions and Records of Bees - XLVIII

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Descriptions and Records of Bees.—XLVIII.

By T. D. A. COCKERELL, University of Colorado.

Augochlora (Augochloropsis) charapina, sp. n.

♀.—Head and thorax green; abdomen shining crimson.
Exactly like the Mexican *A. subignita*, Ckll., except as

follows :—Smaller (anterior wing 6 mm. long) ; mesothorax, although dull and excessively densely minutely punctured at sides, smooth and shining (tinged with golden) in middle, with the punctures well separated ; wings distinctly darker and redder, the first r. n. meeting second t.-c. a little on inner side ; inner orbits and upper margin of clypeus edged with blue ; the strong ridges of metathoracic area longer ; first abdominal segment green at base, and with a slight greenish shade across the middle. Also allied to the Brazilian *A. wallacei*, Ckll., but separated by the densely punctured scutellum. The sculpture of the second abdominal segment is intermediate between that of *subignita* and *wallacei*.

In Vachal's table this runs to the vicinity of *nitidicollis*, *multiplex*, *sympleres*, and *radians*. From *A. nitidicollis* (*Halictus nitidicollis*, Vachal), also from Peru, it differs by the closely punctured scutellum and sides of mesothorax ; from the others by the smooth relatively sparsely punctured middle of mesothorax. From *A. multiplex* it is known by the area of metathorax, which has about as many striae as that of *subignita*. The margin of the area of metathorax is thick, shining, but very finely granular. The lateral corners of prothorax form angles greater than right angles. The dark fuscous hair of the thorax above, front and vertex, as well as the outer side of the hind tibiae, separates it from some species. The tibiae are brilliant green.

Hab. Rio Charape, Peru, 5000 feet, Sept. 12-16 (C. H. T. Townsend).

Augochlora (Augochloropsis) notophops, sp. n.

♂.—Length about $7\frac{1}{2}$ mm., anterior wing 6.

Brilliant shining green, including the legs, *except the tarsi, which are piceous* ; head in front and above and thorax above with coarse black hair ; face on each side of clypeus, cheeks, pleura, and sides of metathorax with inconspicuous pale ochreous-tinted hair ; mandibles (except obscurely reddish apical part), labrum, and lower margin of clypeus black ; *antennae black, not very long* ; head broader than long, eyes very deeply emarginate ; clypeus prominent, shining, golden-tinted, with strong distinctly separated punctures ; front very densely rugoso-punctate ; *corners of prothorax with acute prominent angles* ; mesothorax densely rugoso-punctate at sides and in front, in certain lights with the appearance of a longitudinal black shade on each side ; *a square space in middle of mesothorax shining, with sparse strong punctures, and dark purple, contrasting with the surrounding green* ;

scutellum densely punctured, but with a smooth spot on each side near the middle; area of metathorax with strong plicæ, formed as in *A. charapina*, but upper corners of truncation rounded (distinctly angulate in *charapina*); tegulæ green and rugulose, with a very large, smooth, purplish-piceous spot (essentially the same in *charapina*). Wings dusky, reddish; second s.m. very narrow (not so in *charapina*); first r. n. joining second t.-c. Tarsi with conspicuous ochreous hair. Abdomen smooth and brilliantly shining, with some golden tints, the punctures of the first two segments very distinct, alike, not at all dense; discs of segments with black hair; vibrissæ well developed, pale orange; second and third ventral segments brilliant greenish golden; second ventral segment with the hyaline margin very obtusely angled in middle; third with a larger median process, which is broadly truncate; fourth apparently very deeply emarginate, but the emargination filled by a hyaline plate, the margin on each side of this fringed with orange-ferruginous hair; fifth sharply keeled in the middle.

Hab. Rio Charape, Peru, 5000 feet, Sept. 12-16 (C. H. T. Townsend).

Closely related to *A. charapina*, but aside from the entirely different colour of the abdomen there are several structural differences which do not seem to be due to sex. In Vachal's table (Misc. Entom.) it runs to *A. notophos* (Vach.), differing apparently by the structure of the abdomen. I have seen only the female of *notophos*; it has a reddish abdomen and appears to be distinct from the present insect.

Augochlora nigromarginata (Spinola).

Rio Charapa, Peru, 5000 feet, Sept. 12-16 (C. H. T. Townsend).

Augochlora (Augochloropsis) anquisita, sp. n.

♀.—Length about $8\frac{1}{2}$ mm., anterior wing $5\frac{1}{4}$.

Bright blue-green, the mesothorax with two longitudinal purple stripes; first abdominal segment largely purplish in middle, second segment with a median transverse purple patch; mandibles (except a little green at extreme base) and a large semicircular patch on lower part of clypeus black; clypeus prominent, well punctured; when the face is seen in profile the supraclypeal area is prominent, forming an obtuse angle; eyes very deeply emarginate; front and sides of mesothorax excessively densely and minutely punctured; disc of mesothorax shining, with sparse small punctures;

scutellum closely and minutely punctured; area of metathorax with fine but distinct, but short, raised ridges, the bounding margin shining; apical truncation of metathorax with obscure sparse punctures; anterior lateral angles of prothorax distinct, moderately prominent, lateral (tubercular) angles greater than right angles; antennæ black; tegulæ green, with a large piceous spot. Wings greyish hyaline, not reddish; stigma and nervures dull, rather pale yellowish brown; second s.m. higher than broad; first r.n. entering third s.m. Legs green, the tarsi piceous, the hind basitarsi with a little green. Head and thorax above with black hair, cheeks and pleura with pale hair; hair of legs mostly pale, orange-tinted on inner side of tarsi; hind spur with about four very long spines. Abdomen shining, little punctured, but first segment well punctured at sides; marginal fringe of first segment excessively short, white, the hairs microscopically plumose; fringe of second segment the usual orange vibrissæ, not very conspicuous; third and fourth segments with a fine white pruinosity and scattered black hairs; apex black; venter partly yellowish green. The posterior lateral scutellar punctures become confluent, forming little ridges.

Hab. Rio Charape, Peru, 5000 feet, Sept. 12-16 (C. H. T. Townsend).

Looks at first sight like a species of *Pseudaugochloropsis*. It is related to *A. electra*, Sm. (*artemisia*, Sm.), but Smith's species is larger and golden-green, with the face broader below. By the angular profile of the face it resembles *A. terrestris* (*Halictus terrestris*, Vachal), but the tegulæ are not entirely or almost entirely green and the vibrissæ do not agree well.

Augochlora aurifera, Cockerell.

Quirigua, Guatemala, Feb. 18, at yellow flowers of a small species of Compositæ (*W. P. Cockerell*); Antigua, Guatemala (*W. P. Cockerell*). The Quirigua form has clearer wings than the type.

Augochlora choris (Vachal).

Quirigua, Guatemala (*W. P. Cockerell*). At flowers of *Ipomœa sidaefolia*.

Augochlora binghami, Cockerell.

Quirigua, Guatemala (*W. P. Cockerell*). Variety with rich purple tints.

Augochlora nigrocyanæa, Cockerell.

Quirigua, Guatemala, 21 ♀ (*W. P. Cockerell*). Six (Feb. 12) at *Ipomæa sidæfolia*; two (Feb. 20) at *Ipomæa quinquefolia*; two at *Zexmenia virgulta*. A male was taken at *Ipomæa sidæfolia*, Feb. 10. It has the head and thorax more green than blue, the colour brilliant; clypeus strongly produced, its apical margin, the labrum, and mandibles testaceous; flagellum ferruginous beneath; wings reddish. The mesothoracic punctures are considerably larger than in the female, but extremely dense.

Augochlora seminigra, Cockerell.

Quirigua, Guatemala, 16 ♂, 19 ♀ (*W. P. Cockerell*).

The females mostly show more green on the abdomen than the type. The male is new; it is like the female except for the usual sexual characters; the lower edge of clypeus is broadly cream-colour. Thirteen females were resting on a branch of *Solanum*. Two males and four females were at flowers of *Zexmenia virgulta*; two females were at flowers of *Pontederia cordata*, February 11.

Augochlora urania, Smith, var. *a*.

♀.—Middle of mandibles broadly ferruginous; wings dusky, rather greyish than reddish.

Gualan, Guatemala, Feb. 22, 1 ♀ (*W. P. Cockerell*); Quirigua, Guatemala, 7 ♀ (*W. P. Cockerell*). Of the Quirigua specimens two are from yellow flowers of a species of Compositæ; three (Feb. 20) are from *Ipomæa quinquefolia* flowers; one (Feb. 20) is from *Ipomæa sidæfolia*.

A. urania was described from Brazil, and there is reason to suspect that actual comparison with Smith's type might show the Guatemalan species to be distinct. There is, however, practical agreement with Smith's description, and if our bee is not a local variety of *uranía*, it is at least very closely allied. At first sight *A. urania*, var. *a*, may easily be confused with *A. seminigra*, also common at Quirigua. On closer inspection it is readily separated by its broader form and coarsely granular mesothorax. It is, in fact, nearer to *A. azteculea*, Ckll., which it very greatly resembles; but *azteculea* has the abdomen entirely green and the anterior tibiæ clear ferruginous with a dark patch behind.

The type of *A. urania* is in the W. W. Saunders collection, presumably at Oxford, so I did not see it when examining Smith's species at the British Museum.

Augochlora quiriguensis, sp. n.

♀.—Agreeing with *A. nigrocyanæa*, Ckll., except in being smaller (variable in size, the smallest hardly over 7 mm. long); head much narrower; head and thorax rich metallic Prussian green, the mesothorax with a more or less evident blackish shade in the middle. Wings dusky grey, without the reddish tint seen in *nigrocyanæa*.

♂.—Like that of *A. nigrocyanæa*, but smaller; wings clearer and not reddish; disc of mesothorax not so densely punctured.

Hab. Quirigua, Guatemala, 9 ♀, 2 ♂ (*W. P. Cockerell*). Four females and one male at flowers of *Ipomœa sidæfolia*, Feb. 10–12.

Augochlora quiriguensis sidæfoliæ, var. n.

♀.—Head and thorax black or blue-black, with green on the inner orbits; prothorax, lateral and posterior margins of metathorax, postscutellum and metathorax, or the metathorax largely black.

♂.—Head and thorax bright blue; punctures on disc of mesothorax distinctly separated; wings pale greyish, not reddish.

Hab. Quirigua, Guatemala, 4 ♀, 1 ♂ (*W. P. Cockerell*). Two females are from flowers of *Ipomœa sidæfolia*, Feb. 12. The male, which is possibly not correctly assigned to this variety, is from flowers of plant no. 7.

I confess to being puzzled by *A. quiriguensis*. It seems too different from *A. nigrocyanæa* to be a dimorphic form or variety; yet the males, if I have associated them correctly, agree closely in structure, the only conspicuous difference being in the evidently spaced punctures of the mesothorax of *quiriguensis*. Then, again, *sidæfoliæ* looks at first very different from *quiriguensis*, but it is certainly no more than a variety.

A study of these insects in the field is necessary to determine their exact status. *A. quiriguensis* is very much like the Brazilian *A. francisca*, Schrottky, but it is a more slender insect, and the tarsi resemble the tibiæ in colour (in *francisca* dull ferruginous, with their pubescence of the same colour).

Halictus (Evyllæus) hewetti, sp. n.

♀.—Length about 7 mm., anterior wing $4\frac{3}{4}$. Black, the pale pubescence faintly tinged with ochreous;

tegulæ rather large, piceous, finely punctured all over; hind spurs with numerous oblique fine teeth, rather too long to call the spur serrate. Head broader than long; clypeus short; face and front quite hairy; cheeks unarmed; antennæ entirely black; mesothorax and scutellum moderately shining, very finely and quite closely punctured; scutellum depressed in middle; area of metathorax a broad band, angulate in middle, its whole surface dull black, rugulose, with strong irregular ridges; apical truncation of metathorax heart-shaped, sharply margined. Legs black. Abdomen shining, with very minute piliferous punctures, the whole surface finely pilose, the pile shining pale greyish in certain lights; lateral bases of second and third segments, and fourth slightly, with pale triangular hair-patches; discs of apical segments laterally with fuscous hair.

Hab. Quirigua, Guatemala, 2 ♀ (*W. P. Cockerell*).

The type carries much pale yellow pollen, of large grains, on the hind legs. Superficially very like *H. pseudopectoralis*, Ckll., from Mexico, but easily separated by the dull opaque area of metathorax. There is no close resemblance to any of the Mexican species described by Vachal and Smith. In Crawford's table of North-American species (1907) it runs to *H. glabriventris*, Crawford, from Oregon, but differs by the structure of the metathorax.

The species is dedicated to Dr. E. L. Hewett, under whose directions the ancient ruins at Quirigua were being excavated at the time when the bees were caught.

Halictus townsendi, Cockerell.

The male, hitherto unknown, was taken by Mrs. Cockerell at Antigua, Guatemala.

It is like the male of *H. armaticeps*, but rather large (anterior wing 7 mm.), with the middle and hind tibiæ black except at base and apex. Owing to the colour of the tibiæ, this runs in my table in Proc. Philad. Acad. 1898, p. 51, to *H. pacificus*, but the structure of the metathorax is as in *armaticeps*.

Halictus adustipennis, sp. n.

♂.—Length a little over 8 mm., anterior wing 7.

Black, including the antennæ and legs, except that the tarsi are obscure reddish; tegulæ shining black, well punctured all over, but so minutely that a compound microscope is needed to bring out the character well; wings orange-tinted, becoming a strong orange-fuscous in the

marginal cell, and with a diffused fuscous cloud in the apical region, beyond the marginal cell. Head broad; clypeus not produced, its upper part closely and finely punctured, the lower part (with an angular projection above in middle) dull cream-colour, depressed, shining, with only a few scattered punctures; mandibles normal, dark reddish subapically; antennæ long; sides of face with conspicuous pale hair, contrasting with the bare clypeus; front and vertex dull and minutely granular; hair of head and thorax above short, rather dull white; mesothorax dull and granular (extremely densely punctured); scutellum more shining, but finely and densely punctured; upper border of prothorax at sides, tubercles, and base of postscutellum covered with dense, pale, felt-like hair; area of metathorax poorly defined, shining but closely striatulate; posterior truncation with sharp lateral margins failing above; wing-veins all distinct, third s.m. not elongate. Abdomen dull and minutely granular (extremely densely and minutely punctate as seen under compound microscope), the bases of second and third segments broadly, and most of fourth, shining; no hair-bands, but base of third segment at sides (second also slightly), and whole of fourth (partly abraded in type) and following segments, covered with fine, ochreous, felt-like hair; apical part of venter reddish.

Hab. Amatitlan, Guatemala, Feb. 1912 (*W. P. Cockerell*).

A well-marked species, running in Crawford's table of North-American species nearest to *H. trizonatus*, Cresson, but with the abdomen and wings differently marked and the tegulæ punctured.

Sphecodes patruelis, sp. n.

Sphecodes minor, Cockerell, Canad. Entom., Ang. 1904, p. 231 (Olympia, Washington State).

♀.—Length 7 mm. or a little more.

Abdomen entirely red; tarsi, and anterior tibiæ in front, dark ferruginous; flagellum broadly chestnut-red beneath.

When this was recorded as *minor*, it was remarked that actual comparison of specimens might prove it different from Robertson's species. I now have the genuine *S. minor*, Rob., collected by Miss Eleth Cattell at Wood's Hole, Mass., and it is distinct from the north-western insect, although undoubtedly closely allied. *S. patruelis* is really more like the south-western *S. sophiæ*, Ckll., from which the female differs by the very dusky, reddish wings, and the less hairy face and front. Specimens from intermediate

localities may show that *patruelis* is a subspecies of *sophiæ*. The male of *S. patruelis* is described at the place cited above; it may be useful to add that there are five hooks on the hind wing.

Sphecodes hyalinatus, Schenk.

One male; Wangen, Baden, Aug. 5 (*Cockerell*). Hind wing with six hooks.

Sphecodes trentonensis, sp. n.

♀.—Length about $5\frac{1}{2}$ mm., expanse $9\frac{3}{4}$.

Head and thorax black; abdomen shining rather light ferruginous red, the fourth segment except at base, and the fifth, suffusedly blackish; flagellum obscure reddish beneath; mandibles red, bidentate; face thinly clothed with white hair; clypeus sparsely but distinctly punctured; front very densely punctate, but shining; mesothorax shining, sparsely punctured, a slight median sulcus; area of metathorax shining, coarsely and strongly reticulated; tegulæ rufo-testaceous. Wings dilute brownish, stigma and nervures rufo-fuscescent; second s.m. narrow, receiving first r. n. at beginning of last third; five costal hooks on hind wing; tibiæ and tarsi obscure reddish. Abdomen smooth and shining, with hardly any hair except at apex; first segment apparently impunctate, but the compound microscope shows extremely minute very widely scattered punctures; second segment at base with very few punctures, these extremely minute.

Hab. Trenton Falls, N.Y. (*R. Foster*). From F. Smith's collection; British Museum.

In Robertson's tables (*Entom. News*, April 1903) this runs nearest to *S. cressonii* (Rob.), but the mesothorax is much less densely punctured than in a specimen of that species received from Robertson. The same character separates it from *S. mandibularis*, Cresson, which has been considered identical with *cressonii*. I have what I consider to be true *mandibularis* from Lincoln, Nebraska, April (*L. Bruner*); it differs a little in the metathorax from *cressonii* and is possibly separable. Both *cressonii* and *mandibularis* have the abdomen more hairy than in *trentonensis*. From *S. heterus*, Lovell, *trentonensis* is separated by the brownish wings and other characters; from *S. fragariæ*, Ckll., by the red mandibles, lighter tegulæ, and coloration of abdomen; from *S. eustictus*, Ckll., by the smooth

abdomen ; from *S. nitidissimus*, Ckll., by the sculpture of the metathorax.

Sphecodes manni, sp. n.

♀.—Length about 7 mm.

Not very robust ; head, thorax, antennæ, and legs black, the tarsi obscure reddish at extreme apex ; abdomen shining, rather dark chestnut-red, the apical margin of the fourth segment, and most of the fifth, black or nearly so, but the black not sharply defined ; head and thorax conspicuously hoary with short white hair ; head broad ; mandibles simple, but with a slight inner angle, black, with the apical part dark rufous ; labrum moderately elongated, shorter than in *S. falcifer*, not emarginate at apex ; the basal process of labrum broad and low, coarsely pitted, its margin with extremely short yellowish hairs ; clypeus well punctured ; front extremely minutely and densely punctured ; mesothorax minutely and very densely punctured, but shining between the punctures ; area of metathorax rather small, with irregular confused wrinkles ; tegulæ pale testaceous. Wings pale greyish, stigma and nervures dark brown ; second s.m. very broad. Abdomen, except the hind margins of the segments, conspicuously and quite closely though finely punctured ; end of abdomen with white hair ; middle of first segment almost free from punctures.

Hab. Wawawai, Washington State, Sept. 6, 1908, 3 ♀ (*W. M. Mann*).

The finely punctured abdomen gives the species a rather peculiar appearance. Among the described species of the north-west it may be compared with *S. olympicus* and *S. columbiæ*, which are much larger and very different ; or with *S. washingtoni*, which has the sculpture of mesothorax entirely different. In the table of Maine species it runs to the vicinity of *S. prosphorus*, which has dentate mandibles and a quite different metathorax. In the New Mexico table it falls near *S. fortior*, Ckll., which is no doubt its nearest relative ; but *fortior* is larger, with the mesothorax more coarsely and less closely punctured.

In Robertson's Illinois table, owing to the characters of labrum and mandibles, the species will not run anywhere, though of Robertson's segregates it falls best in the genus *Drepanium*. The combination of mandibular and labral characters given for *Drepanium* does not hold in a series of species ; some have simple mandibles and short labrum, while the female of *S. davisii*, Rob., has bidentate mandibles and a long labrum.

Sphecodes eustictus, Cockerell.

The known range is greatly extended by a female from Pullman, Washington State, Sept. 13, 1908 (*W. M. Mann*).

Sphecodes rohweri, Cockerell, var. *a*.

♀.—Abdomen chestnut-red, with the apex suffusedly blackish; wings greyish.

Hab. Santa Fé, New Mexico, Aug. 1, 1902, 2 ♀ (*Cockerell*).

S. rohweri is known only by a single female, which agrees in structure with the Santa Fé insect, but not altogether in colour. It is possible that a valid subspecies is indicated, but more material is required. The simple mandibles separate this from *S. eustictus*, &c.

Andrena vestali, sp. n.

♂.—Length about 11 mm., anterior wing 8.

Rather robust for a male; black, with abundant lively fox-red hair; clypeus cream-colour, with two cuneiform marks and the narrow lower margin black; head broad; cheeks rounded, simple; process of labrum very broadly truncate, not emarginate; malar space extremely short; sides of face shining, front dull and granular; antennæ black, third joint a little longer than the next two combined; sides of vertex depressed; mesothorax closely and distinctly punctured, the spaces between the punctures moderately shining; area of metathorax dull and granular, not margined; tegulæ piceous. Apical part of wings suffusedly dusky; nervures and stigma dark reddish, stigma rather small; second s.m. receiving first r. n. a little beyond beginning of last third; the long third s.m. greatly narrowed above, so that on marginal it is less, or no greater, than lower side of second s.m. beyond insertion of r. n. Abdomen shining, rather roughened with fine piliferous punctures, the second segment depressed hardly a third; the red hair of abdomen forms a thin covering all over, and is dense at apex, but does not form bands; the ventral segments have evident marginal hair-bands. The joints of the labial palpi measure as follows in μ : (1) 288, (2) 176, (3) 160, (4) 208.

Hab. Five miles east of Boulder, Colorado, on Mesa, at flowers of *Viola nuttalli*, May 3, 1912 (*A. G. Vestal*).

Superficially resembles *A. leptanthi*, from which it is quite distinct. In Bruner's table of *Andrena* it runs to *A. kincaidii*, which has a much broader head, broader clypeus, and

coarsely sculptured metathorax. In Viereck's table in Entom. News, July 1907, it runs to *A. helianthi*, which is not closely allied. In my table in Entom. News, Nov. 1899, it runs nearest to *A. rudbeckiæ*, but is quite distinct from that. I was left in doubt whether it could be Robertson's *Iomelissa violæ*, the male of which was described as without yellow face-marks, but later mentioned as possessing them. Mr. Charles Robertson kindly informs me that "of seven specimens of *Iomelissa violæ* ♂, three have no face-marks; two have a yellow dot on each lower lateral angle of the face; one has a dot on one side, none on the other; and one has a dot on apex of the clypeus." This is not at all like *A. vestali*. *Iomelissa* also has different labial palpi.

