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## Descriptions and Records of Bees - XLVI

T. D. A. Cockerell  
*University of Colorado*

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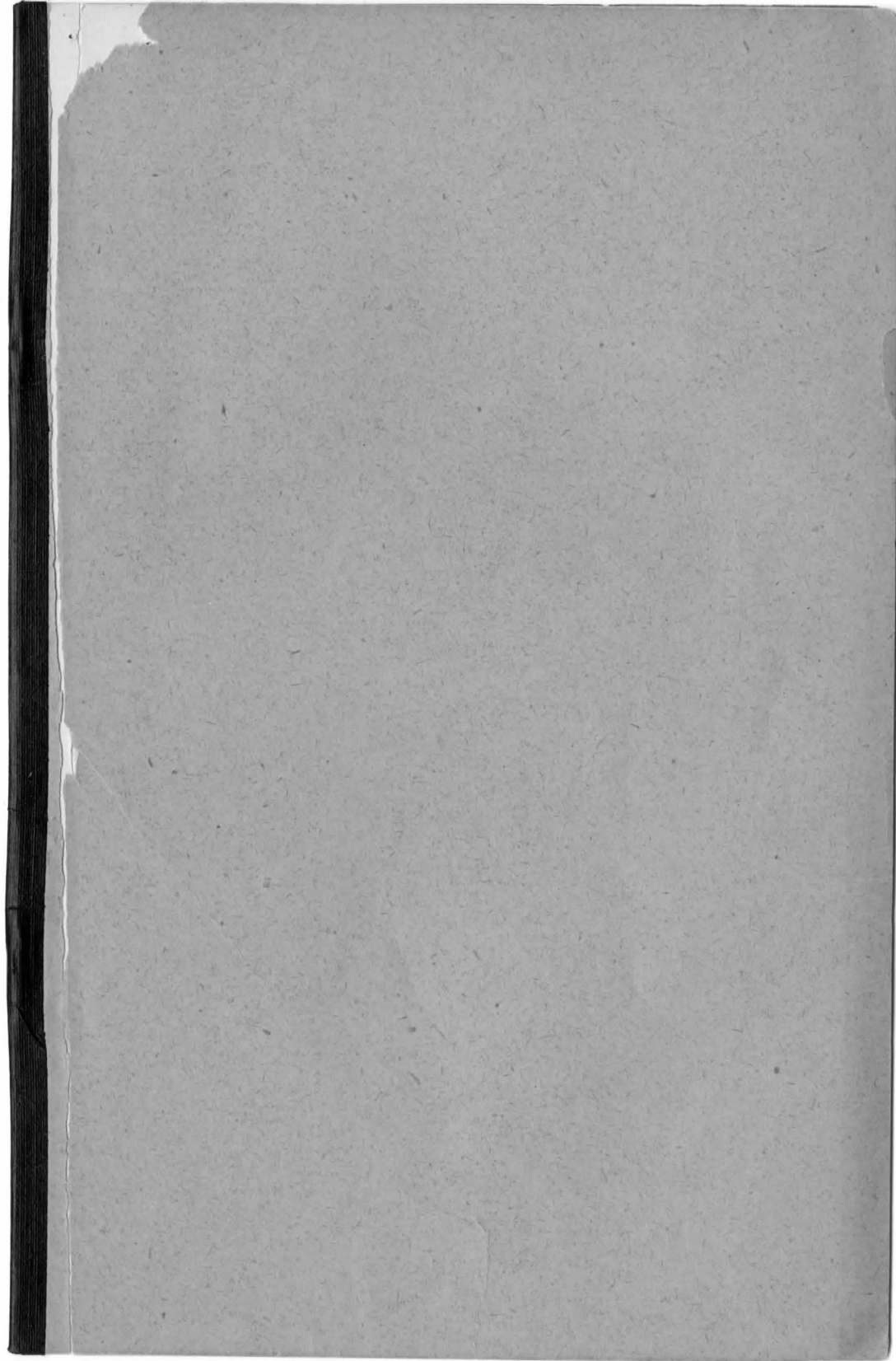
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*Descriptions and Records of Bees.*—XLVI.

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

*Trigona ziegleri mayarum*, subsp. n.

Worker.—Agrees with Friese's short account of *T. ziegleri*, except that the hair of the thorax is pale ferruginous, and the head is distinctly wider, fully  $2\frac{1}{3}$  mm. The size also is a little greater, length fully 6 mm. Friese states that the hind tibiae of *ziegleri* are black at apex, in *mayarum* about the apical half is black, and the hind basitarsi are black on outer side. Among the species known to me, *T. mayarum* comes closest to *T. jaty*, Sm.; but the latter is much smaller, with the pleura mainly dark, and the yellow lateral face-marks forming a much more acute angle above. Other characters of *mayarum* are: mandibles with a little tooth at inner corner, but otherwise unarmed; scape very broadly yellow in front; flagellum clear ferruginous beneath, rufo-piceous above; yellow supraclypeal mark an equilateral triangle; front dullish with fine short reddish hair, but smooth and shining below the ocelli; tegulae apricot-colour; wings with a faint orange tint; abdomen apricot-colour, shining.

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

I expect that when this can be actually compared with *T. ziegleri* it will be found to be a distinct species. An allied but larger species is the Brazilian *T. manni*, Ckll.

*Trigona jatiformis*, sp. n.

Worker.—Length  $4\frac{1}{2}$  mm.

Smooth and shining; head and thorax black with pale markings; abdomen clear ferruginous, with a rather narrow black or blackish band along hind margin of first dorsal segment; labrum honey-colour; mandibles edentate, pallid (pellucid whitish) basally, rufous apically;

clypeus yellow, slightly suffused with reddish; triangular supraclypeal mark and lateral marks pale yellow, the latter elongate, pointed above on orbital margin above level of antennæ, but with the inner margin reddish and not sharply defined; scape pale reddish yellow, black above at apex; flagellum dark; mesothorax nude, shining black, with yellow lateral margins; axillæ yellow; hind margin of scutellum yellowish white; tubercles cream-colour; tegulæ pellucid rufo-testaceous; wings hyaline, faintly dusky, stigma and nervures reddish; legs ferruginous; hind tibiæ with apex broadly, and hind margin except at base, black; hind basitarsus with a large black patch; face and front with fine short pale hair, not at all dense.

*Hab.* Quirigua, Guatemala, = type locality, four workers (*W. P. Cockerell*); Puerto Barrios, Guatemala, one, Jan. 28, 1912 (*W. P. Cockerell*).

Looks exactly like *T. jaty*, Smith, but differs at once by the abdomen, which is broad instead of almost linear. Smith's description of *T. jaty* refers to the male, but I have workers with the same narrow abdomen. The new species also differs from *jaty* by the dark flagellum and other small characters.

*Trigona jaty*, Smith.

Amatitlan, Guatemala, Feb. 1912 (*W. P. Cockerell*); Quirigua, Guatemala, two on "common yellow Compositæ," one at flowers of *Zexmenia virgulta*, Klatt, one Feb. 11, on plant no. 15 (*W. P. Cockerell*).

*Trigona mellaria*, Smith.

Gualan, Guatemala, one Feb. 23, at flowers of *Calopogonium caruleum*, Desv., Feb. 23 (*W. P. Cockerell*); Quirigua, Guatemala, one (*W. P. Cockerell*, 7).

*Trigona stigma*, Smith.

Quirigua, Guatemala, one (*W. P. Cockerell*). New to Central America.

*Trigona nigerrima*, Cresson.

Quirigua, Guatemala, sixteen (*W. P. Cockerell*). Taken at sap, and at flowers of *Pontederia cordata*, L. (Feb. 11), *Ipomæa sidafolia*, Choisy (Feb. 20), and *Centrosema plumieri*, Benth. (Feb. 13). This is smaller than *T. silvestriana*, Vachal. Is it possible that the "*silvestriana*" reported by Vachal from British Honduras was *nigerrima*?

*Trigona argyrea*, sp. n.

Worker.—Length slightly over 3 mm.

Black, including antennæ and legs, but abdomen (which is short and rather broad) shining dark sepia-brown; head large; face up to antennæ flattened, densely covered with short, appressed, brilliantly silver hair; mandibles edentate, black with the apical margin rufous; cheeks small; front shining, the upper part with rather large sparse punctures, as they appear under a lens, but the microscope shows that they are the bases of black bristles; vertex with black hair; posterior ocelli very close to occipital margin; thorax narrower than head, without light markings, the dorsum shining, with black hair, the mesothorax also with very short strongly plumose pale hairs; pleura with pale hair; sides of metathorax minutely pale-tomentose; hair of legs largely black, but white hair on underside of middle trochanters and basal half of their femora (hind legs broken off in type); wings dusky, nervures and stigma dark sepia; tegulæ rufo-piceous; underside of abdomen pale ochreous.

*Hab.* Quirigua, Guatemala, one (*W. P. Cockerell*). The specimen is labelled "nest in clay bank," where it was taken along with a couple of *T. cupira*, Smith.

This may be compared with *T. hyalinata*, Lep., and *T. tubiba*, Smith; differing from both by its very silvery face, from *hyalinata* also by the smaller size, and from *tubiba* by the shining front and mesothorax (these parts in *tubiba* are absolutely dull). *T. argentata*, Lep., has silvery hair on face, but the wings are clear.

*Trigona zexmenia*, sp. n.

Worker.—Length  $7\frac{1}{2}$  to 9 mm.

Robust, abdomen parallel-sided, not quite so broad as thorax; head and thorax dull black, but the clypeus and supraclypeal area shining and strongly punctured; labrum ferruginous, more or less bigibbous; mandibles rufo-piceous, edentate, the broad apical margin sharply marked off and ornamented with elongate punctures; malar space rather large; no light face-marks; front dull and densely granular, as also are the mesothorax and scutellum; antennæ black, with the scape red at base and extreme apex, and flagellum dark reddish beneath; hair of head and thorax above scanty and black, longest on scutellum; edge of mesothorax above tegulæ with a narrow dull yellow stripe; hair of pleura mostly black, partly pale below; tegulæ piceous or rufo-piceous. Wings dusky, with a

strong reddish tint; stigma and nervures testaceous. Legs black, the small joints of tarsi dark red; abdomen dull but not dark reddish fulvous, the segments more or less dusky, though narrowly, at apex. The face is very broad.

*Hab.* Quirigua, = type locality, eight; one at flowers of *Zexmenia virgulta*, Klatt, two at flowers of common yellow Compositæ, three (Feb. 21) at blue flowers of a species of Labiatae (*W. P. Cockerell*); Gualan, Guatemala, one at flowers of *Vernonia aschenborniana*, Schauer, one (Feb. 18) without flower record (*W. P. Cockerell*).

A relatively large species, looking a little like *Melipona mandacai*, Smith, but the resemblance is merely superficial. It should rather be compared with *Trigona fulviventris*, Guér., which is considerably smaller and has a shining abdomen. The two agree in the dense white tomentum on cheeks.

*Trigona fulviventris*, Guérin.

Mrs. Cockerell took this in Guatemala as follows:—Puerto Barrios, six, Jan. 28; Quirigua, five, two at *Zexmenia virgulta*, Klatt, one (Feb. 20) at *Ipomæa quinquefolia*, Grisebach, one (Feb. 11) at *Pontederia cordata*, L.; Amatitlan, February, one; Guatemala City, one.

*Trigona cupira*, Smith.

Mrs. Cockerell took this in Guatemala as follows:—Amatitlan, one; Puerto Barrios, one, Jan. 28; Guatemala City, three (I also have three from Guatemala City collected by Mr. J. Rodriguez); Antigua, one; Gualan, twelve, all but one at flowers of *Vernonia aschenborniana*, Schauer; Quirigua, sixteen, two at nest in clay bank, five (Feb. 12 and 20) at flowers of *Ipomæa sidæfolia*, Choisy.

*Trigona amalthea*, Olivier.

Mrs. Cockerell took this in Guatemala as follows:—Gualan, two, Feb. 22–23, at flowers of *Calopogonium ceruleum*, Desv.; Puerto Barrios, one; Quirigua, five, one (Feb. 11) at *Pontederia cordata*, L., one at flowers of common yellow Compositæ.

*Trigona frontalis flavocincta*, Cockerell, var. *a*.

Quirigua, Guatemala, a variety with lateral thirds of clypeus black or nearly, bases of first and second abdominal segments usually creamy white, the hind margin of first segment very broadly dark; nine workers, one at nest in

clay bank, six at sap, others at flowers of plant no. 7 (*W. P. Cockerell*).

*Melipona fulvipes*, Guérin.

Gualan, Guatemala, one male, Feb. 18 (*W. P. Cockerell*). Near to *M. ligata*, but the male differs. Mrs. Cockerell took workers of *M. fulvipes* at Quirigua, eleven specimens; three (Feb. 20) at flowers of *Solanum*, one (Feb. 11) at *Pontederia cordata*.

*Melipona solani*, sp. n.

Worker.—Length about 10 mm.

Black, with the general build and structure of *M. fulvipes*; face without light markings, except the faintest possible reddish median line on the dull minutely granular clypeus; labrum ferruginous, minutely punctured; antennæ dark, scape rufo-piceous, flagellum reddish at end; hair of head and thorax above abundant, mixed dark fuscous and ferruginous, of sides of thorax rich ferruginous, beneath whitish; mesothorax and scutellum shining, the latter testaceous; tegulæ clear amber-red; wings dusky, very red, especially toward base; stigma and nervures ferruginous; much of middle, and nearly all of hind femora, bright red; apical tarsal joints and end of lobe of hind basitarsus red; hair of legs partly black and partly red, the short appressed hair on inner surface of hind tibiæ with a purple lustre in certain lights; abdomen black with black hair, hind margins of the segments very narrowly obscure reddish (this is wholly wanting on the fifth), and the second and third with a fringe of pale golden-brown hair; venter ferruginous suffused with darker, and with glittering cream-coloured hair.

*Hab.* Quirigua, Guatemala, one at flowers of *Solanum*, Feb. 20, 1912 (*W. P. Cockerell*).

Allied to *M. fulvipes*, but easily known by the lack of yellow bands on the abdomen and of yellow face-markings.

*Augochlora gemmella*, sp. n.

♀.—Length about 6 mm.

Very brilliant shining blue, more green on thorax, varying to nearly all blue-green; in the type the face, vertex, and cheeks are peacock-green, the front blue; thorax blue-green with purple shades, but the scutellum and postscutellum very green, contrasting with the blue metathorax; abdomen blue with purple lights, dorsum of second segment distinctly green; on the legs the blue colour extends to the femora



and anterior and middle tibiæ; labrum black, mandibles with the apical half rufous; clypeus not much produced, strongly but sparsely punctured, its lower margin rather broadly black; antennæ black, scape rufous at extreme base; front minutely granular; cheeks with rather abundant white hair; mesothorax very brilliant, with extremely minute punctures, sparse in middle, becoming dense only at sides; anterior angles of prothorax prominent, greater (but not very much greater) than right angles; hair of thorax scanty and pale; area of metathorax semilunar, with fine plicæ which cover little more than the basal half; apical truncation not distinctly defined above; tegulæ pale rufo-testaceous, with a blue spot. Wings slightly dusky, nervures and the large stigma dark sepia; third s.m. twice as long as second; first r. n. joining second t.-c. on entering basal corner of third s.m.; hind spur with three spines, two very long; hair on inner side of hind basitarsus shining mouse-grey. Abdomen broad, shining, very brilliant, the linear hind margins of the segments reddish; no vibrissæ; much hair on ventral surface of abdomen. The specimens have collected an abundance of white pollen on the hind femora and the under surface of the abdomen.

*Hab.* Quirigua, Guatemala, six females (*W. P. Cockerell*). Three collected Feb. 13, 1912, at flowers of *Centrosema plumieri*, Benth. One at flowers of *Zexmenia virgulta*, Klatt. Two at plant no. 60.

Quite distinct from all other Guatemalan species by the small size and brilliant colours. It belongs to Vachal's group *sericei*, and in his table runs to the much larger and otherwise different *Augochlora tonsilis* (*Halictus tonsilis*, Vachal), except for the long spines on the hind spur. There is quite a close resemblance to *A. cyaneoviridis*, Ashm., from St. Vincent; but Ashmead's species has the area of metathorax covered with fine striæ, the wings browner, the head narrower, and the mesothorax rugulose with dense punctures.

*Augochlora amatitlana*, sp. n.

♂.—Length about 10 mm., anterior wings about 7.

Head and thorax bright blue-green with purple tints, the purple mainly in the form of two suffused longitudinal bands on mesothorax and two spots on scutellum; middle of face golden green; metathorax and postscutellum of the same colour, not so blue as scutellum; a small golden triangle at upper end of metathoracic truncation; head broad above, eyes deeply emarginate, almost without hair; clypeus strongly



produced, shining, rather sparsely punctured, with a little median golden stripe, and the lower margin rather broadly testaceous; labrum brown, pointed below; antennæ black, with a red spot at extreme apex, flagellum very long; front densely granular; mesothorax and scutellum densely granular-punctate; postscutellum large, with indications of longitudinal fluting; area of metathorax large but poorly defined, the middle and base densely wrinkled; posterior truncation sharply defined only at sides below; tegulæ red-brown, with a large green spot and pallid margin. Wings orange-tinted, not dark; the nervures and rather small stigma ferruginous; second s.m. broad, its sides parallel; first r. n. joining second t.-c.; femora and tibiæ green, hind tibiæ black behind; tarsi ferruginous; hind legs long and slender; spurs light ferruginous. Abdomen brilliantly shining, but finely and rather conspicuously punctured, disc of first segments with punctures all over; general colour of abdomen brilliant coppery shading to golden, the middle of the segments (especially the second) reddest, the hind margins broadly pale greenish; thin pale pubescence, especially at sides, but no bands or vibrissæ; underside of abdomen dark green, the third segment broadly emarginate at apex, and the middle beyond the third broadly excavated or hollowed.

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

A magnificent species, presumably one of the *sericei*, but the female is unknown. It seems to be nearest to *A. aurora*, Smith, in which the abdomen is yellowish green and the thorax dark blue-green. It does not agree with anything in Vachal's tables.

*Cænohalictus wilmatta*, sp. n.

♂.—Length about 10 mm., anterior wings nearly  $8\frac{1}{2}$ .

Eyes with short scanty hair; pubescence very conspicuously plumose; eyes deeply emarginate; head broad, eyes converging below; clypeus much produced, shining blue-green, with scattered strong punctures, lower margin rather broadly dull whitish, the actual edge ferruginous; labrum transverse, rufo-fuscous, the base whitish, the apex angular and fringed with long golden hairs; mandibles black; malar space about twice as broad as long; supraclypeal area with a golden patch in middle; front dark green, very hairy; hair of head and thorax below sordid white, of vertex and dorsum of thorax dull fulvous; cheeks brilliantly purple-blue; thorax dark purple-blue, the pleura richly coloured, the mesothorax and scutellum blackish except at sides, the

middle of mesothorax slightly greenish; metathorax very dark green or greenish black; mesothorax and scutellum densely granular-punctate, almost rugose; anterior corners of prothorax not at all prominent; area of metathorax poorly defined, coarsely rugose-wrinkled at base and middle; posterior truncation quadrate, sharply defined only below, overlapped at apex by the golden-tinted tip of basal area; tegulae rufo-fuscous, with pallid margins and a bluish spot. Wings ample, somewhat dusky, conspicuously so at apex; nervures and stigma ferruginous; second s m. large; first r. n. joining second t.-c. Legs with pale hair, orange-tinted on inner side of tarsi; femora and tibiae mainly metallic blue, hind tibiae black behind; tarsi more or less ferruginous, especially the hind ones. Abdomen closely and finely punctured but shining, golden green, the disc of first segment and base and sides of second faintly flushed with coppery; hind margins of segments suffusedly and rather obscurely blackish; venter of abdomen formed as in *Augochlora amatitlana*; antennae long and black.

*Hab.* Amatitlan, Guatemala, Feb. 5, 1912 (*W. P. Cockerell*).

This certainly must be quite closely related to *Augochlora amatitlana*, having essentially the same structure and general type of coloration. In detail, however, *A. amatitlana* is very differently coloured. The eyes of *A. amatitlana* are practically hairless, but with the compound microscope I find a very few short hairs. It is a question whether *A. amatitlana* should not stand as *Cænohalictus amatitlanus*; but, on the other hand, it is possible that actual comparison with the type of *Cænohalictus* (from Ecuador) would show that neither of the insects now described should really be referred to it. Certainly they have not the long hair of the eyes of *C. trichiophthalmus*, Cameron. If, however, we redefined *Cænohalictus* as *Augochlora* of the *sericei* group with hair on the eyes, we have four species: *C. trichiophthalmus*, Cam.; *C. chaetops*, Vachal; *C. amatitlanus*, Ckll.; *C. wilmattæ*, Ckll. The species of Vachal and Cameron are considerably smaller than those from Guatemala, being only about 8 mm. long.

*Dialictus onustulus*, sp. n.

♀.—Length fully  $5\frac{1}{2}$  mm.

Head and thorax olive-green; clypeus smooth with sparse large punctures, the lower half black, the upper half crimson and green; supraclypeal area tinged with brassy; mandibles red at apex; front dull and densely granular; antennae

black, the flagellum stout ; mesothorax dullish, with minute not very dense punctures ; area of metathorax rugose, hardly plicate ; tegulæ small, rufo-piceous. Wings hyaline, faintly dusky, stigma and nervures brownish testaceous ; first r. n. joining second s. m. more than a third from base. Legs black, with pale hair. Abdomen black with a distinct æneous tint, the hind margins of the segments so slightly and narrowly reddish that the fact is hardly noticeable ; no bands, but rather abundant pale hair. The following characters are microscopical : face and front minutely tessellate, sides of front as densely punctured as is possible ; sides of mesothorax (also minutely tessellate) with punctures about as far apart as the diameter of one ; middle of mesothorax with punctures about or nearly twice as far apart ; tegulæ with minute piliferous punctures only ; area of metathorax with irregular basal plicæ ; abdomen with extremely fine piliferous punctures, sparse but not absent on disc of first segment ; third segment with much beautifully plumose hair ; hind spur with four long teeth. The type carries much yellow pollen.

*Hab.* Guatemala City, Guatemala (*W. P. Cockerell*).

Except for the larger size, this agrees fairly well with the description of *D. costaricensis*, Crawford, but the tegulæ are no larger, and the punctures of the mesothorax are not closer, than in *D. occidentalis*, Crawford, from the United States. The insect is nearest to *D. occidentalis*, from which it is known by the brassy or greenish-tinted abdomen and somewhat dusky wings.

*Exomalopsis callura*, sp. n.

♂.—Length 6–6½ mm.

Black, shining ; head broad ; face and front with shining white hair ; labrum with much white hair ; cheeks with white hair, except the uppermost part, where it is black ; occiput with much black hair ; sides of vertex smooth and shining ; ocelli in a very slightly curved line ; no light face-markings ; clypeus and supraclypeal area smooth and flat, with very few minute and feeble punctures ; mandibles black ; scape black ; flagellum normal, black above, bright yellowish ferruginous below ; mesothorax with rather small but strong and close punctures, except the posterior disc, which is impunctate ; hair of thorax black, but a large white tuft on lowermost part of pleura ; tegulæ black. Wings hyaline, suffused with orange, the apical margin broadly pale greyish ; stigma and nervures bright apricot-colour, stigma

large ; second s.m. rather large, receiving first r. n. near beginning of its last third. Legs black, the small joints of tarsi ferruginous ; hair of legs mainly black, but partly reddish on middle and anterior tarsi, and some pale glittering hair on anterior side of hind tibiæ and a little on base of basitarsus. Abdomen shining, finely punctured ; first two segments appearing dark, with hair partly black, though broadly pale ochreous at base and sides of first segment, and red at base of second ; third and following segments densely covered with appressed shining red-orange hair.

*Hab.* Gualan, Guatemala (*W. P. Cockerell*).

Three at flowers of *Vernonia aschenborniana*. Nearest to *E. otomita*, Cresson, but colours of abdomen different, wings not yellowish fuscous, stigma not brown, &c.

