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Descriptions and Records of Bees - XXVIII

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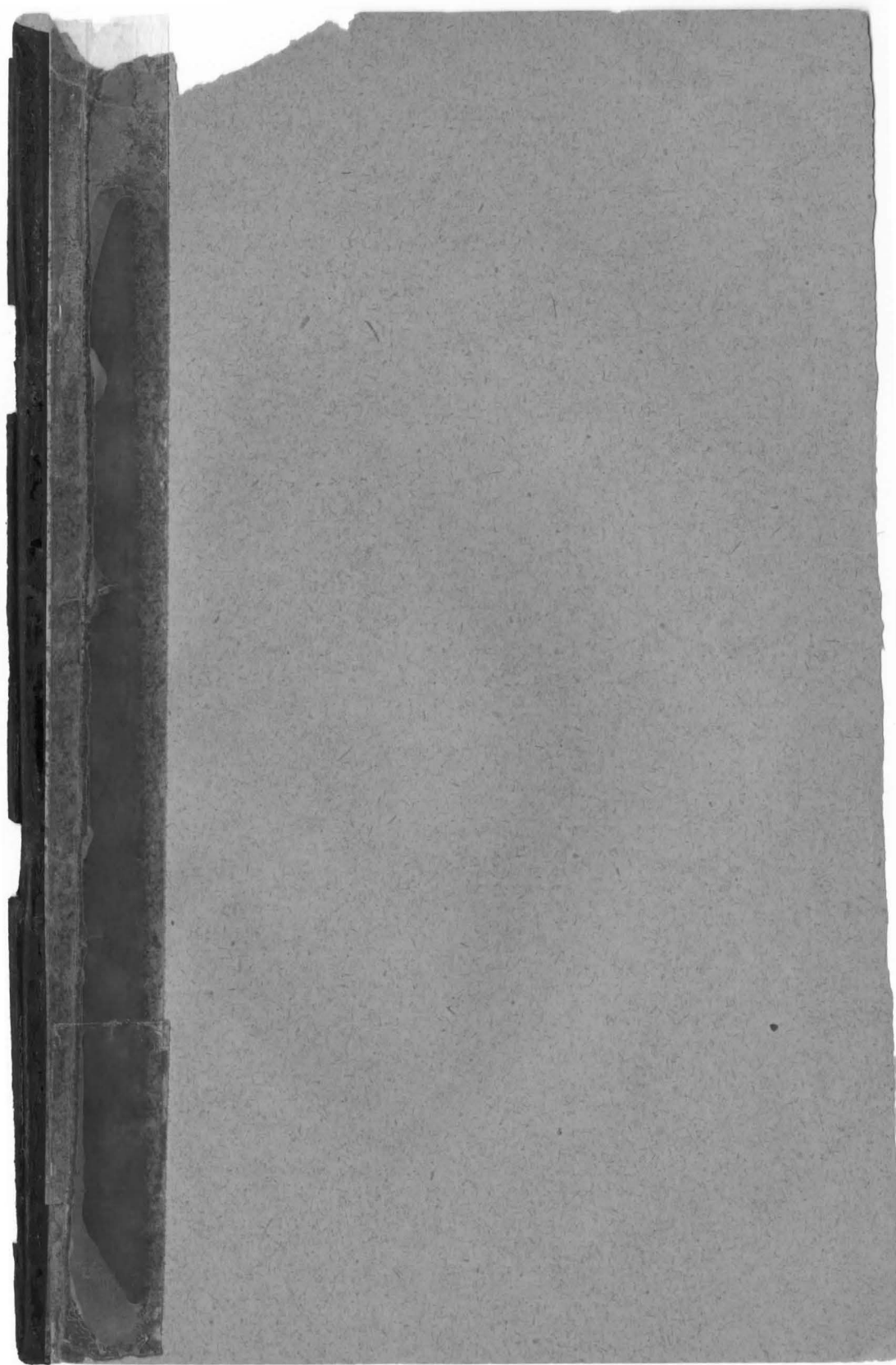
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Descriptions and Records of Bees.—XXVIII.

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

Anthophora darwini, sp. n.

♂.—Length 10 or 11 mm.

Black, the hair of head and thorax above mixed bluish white and black, below white. Eyes very large; facial quadrangle much longer than broad; labrum (except a spot at each basal corner and the linear apical margin), basal two-thirds of mandibles, clypeus (except a large foot-shaped mark, with long heel, on each side above), space between clypeus and eyes, a broad low triangular supraclypeal mark, and scape in front, all *yellow* (reddened by cyanide in type); flagellum ferruginous beneath. Maxillary palpi 6-jointed: the second joint very large and robust, with a comb of numerous short bristles on its anterior side, and a few much longer ones (two near the middle and two apical), as well as some minute ones, posteriorly; apical joint very slender, with a pair of small apical bristles; length of joints in μ : (2) about 595, (3) 270, (4) 185, (5) 85, (6) 100. Tongue long, covered with flattened spatulate hairs, which are about $220\ \mu$ long and 30 wide. Tegulae dark reddish; wings dusky; legs with white hair on outer side, and black on inner, hair of hind tarsi entirely black. Abdomen with five broad apical bands, which are *bright shining blue*, reminding one of the colour of some *Lycænid* butterflies; last ventral segment shining, with a strong median keel.

Much like *A. walkeri*, Ckll., but the colour of the abdominal bands is quite different, without any tinge of green. The spatulate hairs of the tongue are also found on *A. pulchra*, Smith (specimen from F. Smith's collection), and doubtless other allied species. They are found even in the American

A. montana, Cresson, &c., though not so conspicuously developed.

Hab. Port Darwin, Australia, Nov. 1902 (*Turner*). Type in British Museum.

Anthophora cingulifera, sp. n.

♀.—Length about 14 mm.

Robust, black, the hair of head and thorax above mixed black and bluish white; labrum (except two large basal spots connected by a line and linear apical edge), basal half of mandibles, reversed T on clypeus and lower lateral corners broadly, very broad and low supraclypeal mark, lanceolate lateral marks only touching orbits basally, and small mark on scape in front, all *yellowish white*; flagellum ferruginous beneath; tegulæ dark reddish; wings dusky; abdomen with four broad apical bands, shining brilliant blue.

Hab. Dehra Dun, U. P., India, Nov. 1907 (*Lt.-Col. F. W. Thomson*).

I give only a brief description, as the species has been fully described by Bingham (*Hymenop. British India*, i. p. 526) as *A. cingulata* (Fabr.). I have previously (*Ann. & Mag. Nat. Hist.*, Oct. 1905, p. 397) called attention to the fact that true (Australian) *cingulata* is a different species. The type of the new species is in the British Museum.

Anthophora vulpina waltoni, subsp. n.

♀.—Length 12–13 mm.

Appearance and structure of *A. vulpina*, Panzer (specimen from Nassau, F. Smith collection, compared), but paler without any evident yellowish tint, the apex of abdomen with pale hair like the rest, except the middle of the fifth segment, where it is dark reddish brown. Hair of head and thorax long, dull white mixed with black above, white below; clypeus, labrum, and mandibles black; labrum quadrate, coarsely sculptured, strongly shining; clypeus well punctured, with a median raised line; tongue with well-developed spatulate hairs; antennæ entirely black, joints measuring in μ on under side: (3) 730, (4) 220, (5) 240, (6) 255; tegulæ very dark reddish brown. Wings dusky hyaline; first r. n. joining second s.m. beyond middle; b. n. little bent at base. Hair of legs dull white, pale reddish on inner side of tarsi, brush at end of hind basitarsus fuscous; spurs yellowish white; hind margins of abdominal segments narrowly hyaline, the second to fourth with broad shaggy bands of

greyish-white hair, the surface otherwise with appressed greyish-white hair, with long suberect black hairs intermixed.

Hab. Lhasa, Tibet, "viii. ix. 04, Tibet Exped." (*H. J. Walton*). In British Museum.

These bees are of unusual interest on account of the locality. They prove to be quite different from all the Himalayan species recorded by Bingham and Nurse, and also from the species of the Filchner expedition reported on by Friese. On the other hand, they are so close to the European *A. vulpina* that they seem to be only a pale desert race, though it is possible that the male would show more striking differences. They do not accord with any of the members of the *A. vulpina* group described from Turkestan: *A. plebeja*, Morawitz, differs by the dull labrum and testaceous tegulæ; while *A. flavescens*, Fedts., and *A. murina*, Fedts., both have "tegulis calcaribusque testaceis."

Anthophora persicorum, sp. n.

♀.—Length about 14 mm.

Agrees with *A. quadrifasciata*, Villers, in nearly all respects, but differs thus: clypeus creamy white, with only an oblique quadrate black mark on each side above; antennæ dark reddish, the flagellum ferruginous beneath; hair of head above dull white instead of fulvous, and that of thorax doubtless also pale, but worn off on the type except at sides; hair-bands of abdomen rather broader and clear snow-white; wings distinctly darker. The hind legs are quite as in *A. quadrifasciata*, the hind tibia white-haired on the outside, the hind basitarsus entirely black-haired. The legs are more or less reddened, and the femora have sooty hair beneath. Tegulæ pale testaceous; spurs dark reddish.

The *A. quadrifasciata* compared is from Oran. The Persian insect is perhaps only a local subspecies; it looks very distinct, but has no important characters. It exactly agrees with the description of *A. farinosa* except as to the hair of the legs. I have been through all the descriptions of Asiatic species allied to *quadrifasciata* and find nothing identical.

Hab. S.W. Persia (*Escalera*). In British Museum. The specimen is also labelled "K. Sefid."

Anthophora zonata (L.).

This beautiful species has been reported from many of the Malay islands, including Borneo, Java, Celebes, New Guinea,

Aru Isl., &c. It ranges south into Australia, and I have a specimen from China which I cannot distinguish from the Australian examples. Nevertheless, in the moist tropical islands of the Malay Archipelago it has developed several distinct forms, which are probably constant and for the most part confined to particular islands. Material for the satisfactory presentation of the matter is wanting, but the following specimens are in the British Museum :—

- (1) *A. zonata whiteheadi*, subsp. n., ♀. Cape Engano, Luzon, Philippine Islands (*Whitehead*).—Expanse about 20 mm.: abdominal bands pure deep purple, without any trace of green; hair on outer side of hind tibiæ creamy white, with a dark fuscous basal patch; thorax unusually small.
- (2) *A. zonata borneensis*, subsp. n., ♂. N.W. Borneo; "Spitang R." (95-226).—Expanse 21 mm.: abdominal bands blue, tinged with green, strongly metallic; hair on outer side of hind tibiæ mostly black anteriorly and white posteriorly, without any yellowish or fulvous; last ventral segment keeled.
- (3) *A. zonata andrewsi*, subsp. n., ♂. Tjigombong, Java (*C. W. Andrews*).—Expanse about 20 mm.: abdominal bands metallic yellowish green, with coppery tints; hair on outer side of hind tibiæ light fulvous, with a white apical brush. The hair on head and thorax above is bright fulvous mixed with black, whereas in *borneensis* it is dull and rather greenish mixed with black, giving a general blackish effect. The tegulæ in *borneensis* are very dark, with a slight coppery lustre; in *whiteheadi* they are dull but not dark ferruginous; in *andrewsi* they are as in *whiteheadi*.

Two females of *andrewsi* come from N.W. Borneo (95-226). One of these, labelled Spitang R., April 1895, has expanse nearly 24 mm., and colours exactly as in *andrewsi*; the hind tibiæ have light fulvous hair on the outside, with a basal black streak. The other, from Kina Balu, is rather smaller, and the abdominal bands are a more brilliant, distinctly peacock-green. There is, however, no important difference. All these insects have the wings strongly dusky.

The occurrence of *andrewsi* in Java and Borneo, and of both *andrewsi* and *borneensis* on the Spitang River, is contrary to expectation, and may indicate

either that these insects are different species, or are dimorphic forms of one.

- (4) *A. zonata ternatensis*, subsp. n., ♀. Ternate, "92-44, 6106." Similar to *andrewsi*, but the strongly metallic bands narrower and bluer green; band on first segment very narrow, hardly half as broad as in *andrewsi*; hair on outer side of hind tibia (also basitarsus) brilliant fulvous, with no black basal streak. Tegulæ dull ferruginous. Light mark on scape reduced to an obscure spot.

A. borneensis is very like the Australian *A. darwini*, but is larger and more robust, with a strong yellowish tinge in the thoracic pubescence (wanting in *darwini*), while the clypeal black marks are larger and of the usual *zonata* type. There can be little doubt that they are quite independent derivatives of the *zonata* stock.

Anthophora cincta (Fabr.).

♀.—Clypeus with inversed nail-shaped yellow mark; hair of head and thorax mixed yellowish green and black; splendid shining bright metallic-green bands on abdomen.—Obuasi, Ashanti (*Graham*). Cambridge University Museum.

Pasites maculatus, Jurine.

♂. Cyprus (*C. Glaszner*). British Museum.

Anthophora bipartita, Smith.

Sterkfontein, Transvaal (*H. P. Thomasset*). British Museum.

Anthophora pulcherrima, Bingham, var. *a*.

♂. Khamba Jong, Sikkim, 15,000-16,000 ft., 15-30. vii. 03; Tibet Exped. British Museum.

The specimen differs from Bingham's description in having black hair on each side of the face, especially near the antennæ; it also has a supraclypeal mark (transverse band), and lateral face-marks represented by a light streak on each side of the clypeus. The hind basitarsus has a broad obtuse tubercle on the anterior side beyond the middle, and the hind spur is curved at end.

Anthophora megarrhina, sp. n.

♀.—Length about 19 mm.

Black, wholly without light tegumentary markings; pubescence black, except as follows: on face and vertex

ochraceous, though black on front; on cheeks below long and white, though broadly black next to eyes; on mesothorax anteriorly dark red, and laterally reddish mixed with black; on hind part of thorax dull white; a little white sublaterally on first abdominal segment; third and fourth segments with shaggy apical bands of dull white, that on third interrupted in middle; ventral surface with more or less long white hair; anterior femora below with long shining white hair; middle tibiæ apically in front, and outer surface of their basitarsi, with glittering white hair; hind tibiæ and tarsi on outer side with glittering white hair, but hind margin of tibiæ with black; anterior tarsi with yellowish hair on inner side. Hind femora ferruginous (tegument) behind. Clypeus greatly produced, shining and strongly, but not densely punctured, keeled in the middle, the keel ending in an obscure fork some distance before the lower margin; labrum shining, very coarsely and strongly sculptured; malar space very large; antennæ entirely black, third joint slender, considerably longer than the next three combined; disc of mesothorax shining, with scattered punctures, sides densely and minutely punctured; tegulæ piceous. Wings moderately dusky (about as in *A. hispanica*); b. n. going basad of t.-m.; first r. n. joining second s.m. considerably beyond middle; legs normal.

Hab. Khamba Jong, Sikkim, 15,000–16,000 ft., 15–30. vii. 03; Tibet Exped. British Museum.

Anthophora megarrhina soluta, var. nov.

♀.—Length about 20 mm.

Light hair of head reduced; hair of thoracic dorsum practically all black, but a few reddish hairs intermixed in front, and metathorax behind wings with long white hairs; abdomen without light hair-bands; hair on outer side of hind legs blackish. A mere variety of the last, with the hair nearly all black except on lower part of face, where it is dull yellowish.

Hab. Gyangtse, 13,000 ft., June 1904; Tibet Exped. (*H. J. Walton*). British Museum.

The male of this species is represented by two specimens, which come from the type locality, but have the dark hair of the variety.

♂.—Similar to the female except for the usual sexual characters; hair black, except some pale overlapping supra-clypeal area, a white patch on each side of clypeus apically, long white hair on lowermost part of cheeks, some white behind wings, and a certain amount of pale hair on legs; mandibles black; labrum cream-colour except a large brown

spot on each side; clypeus trilobed, yellow except lateral sutural stripes and linear lower edge; a transverse supra-clypeal band, lateral marks (filling space between clypeus and eye, except that they are more or less excavated above), and scape in front also yellow; eyes greenish, prominent; tongue and labial palpi very long (tongue fully 12 mm.); projecting apex of second joint of labial palpi with a conspicuous brush of red hair; pulvilli with two teeth or horns; middle tarsi ordinary; hind basitarsus not toothed; apical plate of abdomen emarginate.

Hab. Khamba Jong; all particulars as in type.

In Friese's tables ('Die Bienen Europa's') this runs nearest to *A. vernalis*, but is quite distinct. It is not like any of the described Indian species.

Anthophora khambana, sp. n.

♀.—Length 15 mm.; expanse 26.

In appearance closely resembles Bingham's figure of the female of *A. pulcherrima*, having the same ochreous hair on thorax and base of abdomen, and the same bright red hair covering the abdomen beyond. It is evidently close to *pulcherrima*, but differs as follows:—Hair of head, pleura, and under side of thorax entirely black; sides and apical segment of abdomen with black hair; hair of legs black, reddish on inner side of anterior tarsi. Malar space well developed, about twice as broad as long; labrum shining, with irregular deep punctures; clypeus strongly punctured, not keeled; antennæ black, third joint fully as long as the three following; tegulæ dark reddish. Wings moderately dusky; b. n. meeting t.-m. Hind spurs ferruginous, curved at end. The abdomen has a subapical tuft of white hair on each side beneath.

Hab. Khamba Jong, Sikkim, 15,000–16,000 ft., 15–30. vii. 03; Tibet Exped. British Museum.

Anthophora orophila, sp. n.

♀.—Length about 14 mm.; expanse about 23½.

No light tegumentary markings; hair of head except vertex, pleura, ventral surface, legs, and dorsum of abdomen beyond second segment *black*; hair of vertex, thorax above, and first two segments of abdomen yellow, becoming a lively orange on second abdominal segment; malar space well developed; labrum very coarsely sculptured; clypeus well punctured at sides, but very sparsely in middle; third antennal joint as long as the three following together; tegulæ

ferruginous. Wings moderately dusky, b. n. going basad of t.-m. Spurs and small joints of tarsi ferruginous. The coloration of the abdomen agrees with that in *A. himalayensis*, Rad., but the hair on the legs is differently coloured, the clypeus is not carinate, &c. The marginal cell is shorter and the first r. n. joins the second s.m. further beyond the middle than in *A. khambana*.

Hab. Khamba Jong, Sikkim, 15,000–16,000 ft., 15–30. vii. 03; Tibet Exped. Brit. Museum.

Bombus sumatrensis, Ckll., var. *ardentior*, nov.

♀.—Length about 17 mm.

Structure as in *B. sumatrensis*: hair of face, front, vertex, and cheeks entirely black; of labrum reddish black; of thorax above yellowish white; of abdomen black, on fourth and fifth segments rather dull ferruginous. A colour-variety only, with the abdominal band red instead of yellowish white.

Hab. Sumatra, "x. 1, 5. 81." British Museum, 92. 182.

Bombus irisanensis, sp. n.

♂.—Length about 14 mm.; expanse 31.

Black, the hind tibiae and tarsi and small joints of other tarsi obscure reddish; hair of head all black except a little reddish on labrum and mandibles; hair of thorax above entirely black, but on pleura fulvous; first two segments of abdomen entirely and densely covered with bright yellow hair (a rather fulvous yellow), the others with black, and the venter also with black; legs with black hair. Wings ample, deep fuliginous, but still transparent enough for print to be easily read through them. Clypeus convex, smooth and shining in the middle, punctured at sides; malar space longer than broad; a red tubercle at base of mandibles; ocelli very small; third antennal joint about as long as fifth.

Structurally this much resembles *B. sumatrensis*, but the colours are entirely different. The colour will also readily distinguish it from the Philippine *B. mearnsi*, Ashmead. In the colour of the wings it resembles the Chinese *B. haemorrhoidalis*, Sm., but that has a short malar space and many other differences.

Hab. Irian, Benquet Prov., Luzon, Philippine Islands, May 28. British Museum, 1906–44.

Bombus rufipes, Lep., var. *melanopoda*, nov.

♀.—Length about 25 mm.; anterior wing 18.

Robust, black, with black pubescence, that on apex of

abrum ferruginous; legs black, the hind tibiæ very dark reddish. Wings dark.

Similar to *B. rufipes*, but distinguished by the dark black-haired legs. The difference is not absolute, as the hind legs have many of the long tibial hairs orange-tipped and the hair on the inner side of the basitarsus is wholly dull ferruginous. *B. rufipes*, var. *obscuripes*, Friese, from Java, has dark hair on the legs, but the legs themselves are clear red.

F. Smith compares *B. rufipes* with *B. eximius*, Sm., noting the important colour-differences. The Sumatran specimen now before me also differs structurally, having the third antennal joint longer and the clypeus and malar space very much longer. In the long malar space, the long clypeus, shining on the disk, the bituberculate labrum, &c. it agrees with the other Sumatran forms, from which it differs totally in coloration.

Hab. Sumatra. British Museum, 92. 182.

Bombus tunicatus, Smith.

Baltistan. British Museum, 88, 31.

In a worker from Simla (F. Smith's collection) and one of those from Baltistan the second abdominal segment is covered with reddish hair, the third with black, after which follows the bright red band. In the other Baltistan example the second and third segments are covered with black, except that the second has a little red at base. The black thoracic band is inclined to be evanescent laterally and in the first Baltistan specimen is reduced to a few hardly noticeable black hairs.

This species is evidently variable, and I am inclined to think that *B. gilgitensis*, Ckll., is a variety of it.

B. terrestris, var. *fulvocinctus*, Friese and Wagner, 1909, from Simla, is evidently *B. tunicatus*. *B. terrestris*, var. *simlaënsis*, Friese and Wagner, 1909, is intermediate, at least in colour-pattern, between *tunicatus* and *gilgitensis*.

Gronoceras felina (Gerst.).

Megachile felina must be referred to *Gronoceras*, although the male flagellum is not wholly characteristic. The abdominal spines of the male are quite normal for the genus; the anterior coxæ each have two spines, one long and obtuse, the other short and sharp.

Mayotte, Comoro Is., from Berlin Museum; Katanga District, Congo Free State (*Dr. A. Yale Massey*), British

Museum. The latter, a female, has ventral scopa ferruginous, whitish at sides, black on last segment.

Cælixys turneri, sp. n.

♀.—Length $10\frac{1}{2}$ mm.

Black, with bright chestnut-red tegulæ, strongly dusky wings, and *narrow bright red hair-bands on the hind margins of the abdominal segments*. Hair of eyes rather long; face with appressed yellowish-grey hair, a conspicuous ochreous tuft under each antenna; vertex, mesothorax, and scutellum with extremely large punctures, as dense as possible; hair of occiput, upper part of metathorax, &c. reddish brown, of pleura and cheeks dull white; mesothorax and scutellum with a delicate poorly developed median raised line; scutellum not tuberculate in the middle, lateral teeth well-developed, a little curved inwards; last dorsal abdominal segment delicately keeled, not greatly elongated; last ventral produced far beyond last dorsal, turned downwards, narrow, notched on each side before the end; first three ventral segments with large well-separated punctures, fourth with smaller punctures. The structure of the end of the abdomen is nearly as in *C. elongata*, Lep., but the subapical notches are smaller and the last ventral is more evidently conical in outline.

♂.—Similar, with the same red bands. Face densely covered with yellowish-white hair, but that just beneath the antennæ and also that on the eyes ochraceous; abdomen with a small tooth on each side of penultimate segment, a long red tooth on each side of last segment, and the usual four black apical teeth, the lower ones much longer than the upper; ventral segments with fringes of pure white hair, the first with the hind margin broadly red (tegument) and only a little white hair in the middle; anterior coxæ with long spines.

Hab. Shillong, Assam, June and July 1903 (*R. Turner*).

A very distinct species, easily known by the red abdominal bands. Mr. Turner had already recognized that it was new.

Euglossa ignita, Smith.

Ecuador (*Rosenberg*). British Museum.

Euglossa cordata (L.).

Jamaica (*Mrs. Swainson*). British Museum.

Ceratina chalcites, Latr., var. *a*.

Female with no light spot on clypeus.

La Sagra, Granada (*Escalera*). British Museum.

Ceratina binghami, Ckll.

Dehra Dun, U. P., India, Nov. 1907 (*Lt.-Col. F. W. Thomson*). British Museum.

Crocisa luzonensis, sp. n.

♀.—Length about 12 mm.

Wings very dark; light markings blue; scutellum of the **W**-type, but the notch not deep and its sides slightly undulating, so that it is rather intermediate between the two types; face with blue hair; a strong keel between antennæ; vertex shining; mesothorax with a **T** and two spots in pale bluish, not strongly marked; pleura with a band of blue hair; hair of scutellum all black; tibiæ (the basal half of hind tibiæ only) and tarsi blue-haired on outer side. Abdomen with entire blue bands, which are exceedingly brilliant but not metallic; the first segment is blue except the hind margin and a large quadrate basal patch.

Hab. Irian, Benquet Prov., Luzon, Philippine Is. British Museum, 1906-44. Collected May 30.

This species will be further discussed in connexion with other Malayan members of the genus.

Boulder, Colorado.

March 31, 1910.

