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The Philippine Bees of the Families Anthophoridæ and Melectidæ

T. D. A. Cockerell
University of Colorado

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THE PHILIPPINE BEES OF THE FAMILIES ANTHO-
PHORIDÆ AND MELECTIDÆ

By T. D. A. COCKERELL
(*University of Colorado*)

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
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THE PHILIPPINE BEES OF THE FAMILIES ANTHOPHORIDÆ AND MELECTIDÆ

By T. D. A. COCKERELL

(University of Colorado)

The two families now discussed include the most highly ornamented Philippine bees, remarkable for their blue or green markings, due to appressed scalelike hairs. They are long-tongued; the Anthophoridæ make nests, in which the Melectidæ are parasitic. The latter are represented by the genus *Crocisa*, which is easily known by the expanded emarginate scutellum, with the margin W-like or -like, according to the species. The species of *Anthophora* are swift and powerful fliers.

Genus ANTHOPHORA Fabricius

Abdomen with narrow white hair bands; a large robust species.

luzonica Cockerell.

Abdomen with lilac or purple bands..... whiteheadi Cockerell.

Abdomen with shining green or bluish green bands korotonensis Cockerell.

Anthophora luzonica Cockerell.

Anthophora luzonica COCKERELL, Ann. & Mag. Nat. Hist. (1914), VIII, 14, 12.

LUZON, Laguna, Mount Maquiling (*Baker*).

Anthophora whiteheadi Cockerell.

Anthophora zonata whiteheadi COCKERELL, Ann. & Mag. Nat. Hist. (1910), VIII, 5, 412; Proc. U. S. Nat. Mus. (1911), 40, 259.

LUZON, Cagayan, Cape Engaño (*Whitehead*). It is probably this insect that has been erroneously listed from the Philippines as *A. cingulata* Fabricius.

Anthophora korotonensis Cockerell.

Anthophora korotonensis COCKERELL, Ann. & Mag. Nat. Hist. (May, 1911), VIII, 7, 491.

Anthophora zonata stantoni COCKERELL, Entomologist (July, 1911), 44, 233; Ann. & Mag. Nat. Hist. (1915), VIII, 16, 4.

This is the species reported from the Philippine Islands as *A. zonata* Linnæus. I described it as *A. korotonensis* from a single male taken at Koroton, Formosa. The name *stantoni* was based on a female from Manila. A series of males from the Philippine Islands shows that both names refer to a single species. The females vary in the color of the bands on the abdomen, as follows:

Variety *a*, (*stantoni* proper), first two bands green, second two blue. Manila and Los Baños.

Variety *b*, first band emerald green, the other three pearly blue with a greenish tint. Los Baños.

Variety *c*, all the bands alike, extremely brilliant blue-green. Los Baños.

Variety *d*, bands very pale pearly green. Davao.

LUZON, Manila (*W. A. Stanton*): Laguna, Los Baños and Mount Maquiling (*Baker*): Benguet, Baguio (*Baker*). MIN-DANAO, Davao (*Valdez*), Dapitan (*Valdez*).

Genus CROCISA Jurine

The records of *C. emarginata* Lepeletier, *C. nitidula* Fabricius, and *C. lamprosoma* Boisduval from the Philippines are undoubtedly erroneous. The following four species are known to occur:

- Abdominal bands brilliant blue 1.
- Abdominal bands pallid blue or grayish 2.
- 1. Abdominal bands shining, no inclosed black area on first segment, but a transverse posterior incision..... *caelestina* sp. nov.
- Abdominal bands shining, that on first segment interrupted by a longitudinal band in middle *crucifera* sp. nov.
- Abdominal bands very bright blue but not shining, first segment with a large black area surrounded by blue..... *luzonensis* Cockerell.
- 2. [First abdominal segment with a very broad continuous basal hair band; abdominal bands gray with some lilac scales; wings very dark (Celebes) *kalidupana* sp. nov.]
- First abdominal segment with about the middle third dark; abdominal bands pale blue; wings only moderately dark *irisana* Cockerell.

Crocisa luzonensis Cockerell.

Crocisa luzonensis COCKERELL, Ann. & Mag. Nat. Hist. (1910), VIII, 5, 419.

LUZON, Benguet, Irisan (collector unknown): Nueva Vizcaya, Imugan (*Baker*).

Crocisa irisana Cockerell.

Crocisa irisana COCKERELL, Entomologist (Aug. 1910), 219.

LUZON, Benguet, Irisan (collector unknown). Type in British Museum.

Crocisa caelestina sp. nov.

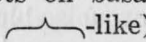
Female.—Length, about 11 millimeters; very robust, black, with the tegument of the abdomen more or less purplish; blue markings exceedingly brilliant and shining, as follows: Upper half of face, supraclypeal region (which is very strongly keeled), sides of front broadly, small patches next to ocelli, band on cheeks, very large transverse patch on pleura, small spot on lowest part of pleura, transverse spots partly on mesothorax

and partly on prothorax, longitudinal band on anterior part of mesothorax, large spot on each side of disk, line over tegulæ, spot in front of each axilla, very broad band across first abdominal segment (the posterior margin broadly incised in middle, the lateral corners of the incised area pointed), broad bands (narrowly interrupted in middle) on second to fifth segments; spot on hind coxæ, outer side of middle and anterior tibiæ, but only basal half of hind tibiæ, and a few blue scales on anterior tarsi. Middle and hind tarsi and the W-like scutellum without blue; wings dark fuliginous; clypeus finely and closely punctured; flagellum obscurely reddish beneath.

LUZON, Laguna, Los Baños (*Baker*). A beautiful species, distinguished from *C. rostrata* Friese by the immaculate scutellum and dark basitarsi. It is very closely related to *C. nitidula* Fabricius from Amboina, but is larger, with somewhat different scutellum, and the markings clear cobalt blue, not greenish blue. The name *nitidula* has been applied to various forms, but I have seen a specimen from Amboina, the original locality.¹ It is possible that the Philippine and Amboina insects may be found to represent only races of one species, but they are more likely to be distinct, without intergrading forms.

The following species from Celebes is described, as it was sent by Professor Baker with the Philippine collection:

Crocisa kalidupana sp. nov.

Male.—Length, about 9 millimeters; black, the tegument of abdomen slightly purplish; light markings pale gray, with lilac scales sparsely intermixed on prothorax, pleura, sides of abdomen, and legs; light patches and spots as follows: Face and sides of front, band on cheeks, interrupted band on prothorax (slightly invading mesothorax), large rounded patch on pleura, five spots on mesothorax (the anterior median one short and those before axillæ small), very broad band on first abdominal segments, very broadly incised in middle, the corners of the incision pointed, broadly interrupted bands on the other segment, outer side of anterior tibiæ, and large spots on basal half of middle and hind tibiæ. Scutellum (which is -like) and tarsi without light marks; wings dark fuliginous; anterior femora very small, reddish; hind femora with a sharp thorn-like tooth beneath.

CELEBES, Kalidupa (*H. Kühn*). Related to *C. quartinæ* Gribo, but easily separated by the color of the markings. The

¹ See *Bull. Am. Mus. Nat. Hist.* (1907), 233, where for "scutellum without dark marks" read "without light marks."

type of marking on the first abdominal segment is the same as that in *C. caelestina*, but in *C. caeruleifrons* Kirby the basal band is interrupted in the middle, though the posterior incised or excavated area is of the same character.

Crocisa crucifera sp. nov.

Male and female.—This is the species that Friese determined for Professor Baker as *C. quartinæ* Gribodo (type locality, Celebes), but he included in *quartinæ* a variety of species, even the shining blue-spotted one of Australia. *Crocisa crucifera* differs from the description of *C. quartinæ* by the two conspicuous blue spots on the scutellum; it also has the scutellum W-like, though the incision is very wide and relatively shallow. The first abdominal segment is blue, except the hind margin and a longitudinal median band, and the longitudinal band extends down the other segments, producing a black cross on a blue ground. The male has the hind femora toothed beneath.


LUZON, Laguna, Los Baños (Baker 306).

The somewhat related Australian form, which has also passed as *quartinæ*, requires a name:

Crocisa omissa sp. nov.

Crocisa quartinæ COCKERELL (not Gribodo), Proc. Linn. Soc. N. S. W., 1912 (1913), 595.


Crocisa caeruleifrons COCKERELL (not Kirby), Entomological News (1907), 46.

The scutellum is -like and without blue spots; the pattern of the first abdominal segment is similar to that of *C. caeruleifrons*, except that the incision is broader.

I have seen the type of *caeruleifrons* Kirby; it is certainly distinct. The type of *C. omissa* is from Mackay, Queensland (Turner 302), the species extends south to New South Wales.

The following new species of *Crocisa* have been lately obtained by Prof. C. F. Baker in the Malay Peninsula:


Crocisa callura sp. nov.

Female.—Length, 15 millimeters; very robust, black, with turquoise-blue markings, not shining; wings very dark fuliginous, even the usual pale spots dusky; scutellum without blue spots, its margin -like. Allied to *C. decora* Smith, but larger, and with the following special characters: Median blue mark on mesothorax a band extending over halfway from anterior margin toward posterior end; spots on each side of disk large, oval; posterior spots large; axillæ with small spots; scutellum longitudinally grooved and well punctured; tubercles

with black fringe; upper end of mesopleura covered with pale blue hair, and a blue spot on lower part, the interval black; white hair projecting beneath scutellar notch; anterior and middle tibiæ blue on outer side, hind tibiæ with only basal half blue; all the basitarsi with blue hair on outer side; first abdominal segment with basal band having a linear interruption, and the transverse black discal area with its basal edge straight, its lateral corners pointed, and the apical blue band widely interrupted; the other abdominal segments have rather widely interrupted bands; apical segment without blue.

PENANG ISLAND (*Baker 9077*). *Crocisa ridleyi* Cockerell, from Penang, is smaller, with W-like scutellum, anterior margin of pleura entirely covered with light hair, markings much paler, and other differences.

Crocisa reducta sp. nov.

Female.—Length, about 11 millimeters; black, with turquoise-blue markings, not shining; anterior wings fuliginous, with the usual pale spots and areas well marked; scutellum without blue spots, its margin -like. Allied to *C. callura*, but smaller, and differing thus: Third antennal joint shorter than fourth (longer than fourth in *callura*); median mark on mesothorax short, not longer than the transverse diameter of anterior marginal marks, not closely approaching anterior margin; spots on each side of disk small; spots on axillæ larger; scutellum polished and punctured, the punctures more or less in transverse rows; first abdominal segment with basal band continuous, but apical band extremely widely interrupted, and the lateral lobes of the black area very broadly obliquely truncate at end, the upper (basal) margin of the black area also concave; pygidial plate broader at end.

SINGAPORE (*Baker 9076*). A specimen of *C. decora* Smith, also from Singapore, is very similar, but has much larger spots on each side of disk of mesothorax, and the scutellum with very minute punctures, those of *reducta* being strong and very distinct.

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