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Descriptions and Records of Bees.— IV.

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Descriptions and Records of Bees.—IV.

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

Bombus sumatrensis, sp. n.

♀.—Length about 18 mm.

Head elongate, narrow, the greater part of the clypeus, which is smooth and shining, below the level of the eyes;

malar space long, smooth and shining; a round red tubercle at extreme base of mandibles; labrum bituberculate, with a median depression, its lower part with reddish and black hair; hair of face and cheeks long and black, that of upper part of head mixed black and white, the white hairs being long and mainly on occiput; antennæ entirely black, scape long, strongly curved; first joint of flagellum as long as third or slightly longer, the second much shorter than either; hair of thorax long, dense, yellowish white, with no sign of any median band or patch. Legs very dark reddish, the hind tibiæ and tarsi quite bright ferruginous; hair of legs black and orange, the latter mainly on the distal parts; hind metatarsi very broad. Wings strongly suffused with orange-brown, nervures ferruginous. Hair of abdomen long, black on first two segments, with yellowish white toward the sides, especially on the second; black on third segment, yellowish white on fourth and fifth, the colours largely mixed owing to the overlapping of the long hairs and the presence of more or less pale hair even amongst the black; hair of venter black, except at apex (principally fringe of penultimate segment), where it is yellowish.

Hab. Sumatra; marked "at flower, 2381. X², 2. 5. 81." In collection of British Museum, received in 1892.

This is the first *Bombus* known from Sumatra, the *B. bellicosus*, Sm., supposed to be from "Sumatra or India," being really American according to Bingham. It is closely allied to *B. Mearnsi*, Ashmead, from the Philippine Islands. Unfortunately *B. Mearnsi* is known only from a worker which has been in alcohol; but it seems to be different from the Sumatra species, and Dr. Ashmead, to whom I showed the insect now described, expressed the opinion that it was not the same as his. *B. rufipes*, Lep., from Java, is also allied, but is readily distinguished by the black pubescence. Among the Indian species *B. sumatrensis* appears to be nearest to *B. funerarius*, Sm.

Cladocerapis bipectinatus (Smith).

Lamprocolletes bipectinatus, Smith, Trans. Ent. Soc. Lond. 1856, Proc. p. 31.

Smith described this remarkable bee as above, and then in 1862, forgetting all about the first description, redescribed it as *L. cladocerus*. The species, under the latter name, became in 1904 the type of my genus *Cladocerapis*.

ANTHOPHORA, Latr.

The Australian species before me may be separated as follows :—

- | | | |
|---|----|----------------------------------|
| Abdomen not, or not obviously, banded;
covered with appressed fulvous hair | 1. | |
| Abdomen conspicuously banded | 2. | |
| 1. Tegument of abdomen black, except broad
hind margins of segments; clypeus yellow,
with two large brown patches | | <i>scymna</i> , Gribodo, ♀. |
| Tegument of abdomen red; clypeus with a
large reversed T in yellow | | <i>rhodoscymna</i> , Ckll., ♂. |
| 2. Clypeus light, with a black stripe on each
side of the upper part; males | 3. | |
| Clypeus with at least large black marks . . | 6. | |
| 3. Larger, about 13 mm. long; hair of thorax
above bright orange-fulvous, with black
intermixed; abdominal bands bright blue. | | <i>emendata</i> Gilberti, Ckll. |
| Smaller; abdominal bands greenish or
ochreous or pallid | 4. | |
| 4. Hair of thorax above bright orange-fulvous,
with black intermixed; abdominal bands
emerald-green shading to blue | | <i>emendata</i> , Smith. |
| Hair of thorax above ochreous or light
fulvous, with black intermixed | 5. | |
| 5. Abdominal bands very light bluish | | <i>zonata subcærulea</i> (Lep.). |
| Abdominal bands very light greenish | | <i>zonata subcærulea</i> (Lep.). |
| 6. Sides of clypeus broadly black, leaving a
light pyramid, which is notched on each
side; abdominal bands dull white; size
rather small; male | | <i>Salteri</i> , Ckll. |
| Clypeus with a large reversed T in yellow,
its stem broadly truncate on upper margin;
size rather small; males | 7. | |
| Clypeus with a light reversed T, its stem
tapering above, pointed; size larger;
females | 8. | |
| 7. Hair of mesothorax light blue mixed with
black | | <i>Walkeri</i> , Ckll. |
| Hair of mesothorax yellow mixed with
black | | <i>adelaidæ</i> , Ckll. |
| 8. Hair of mesothorax light greenish mixed
with black; light hair on outer side of
middle legs strongly suffused with blue;
abdominal bands light blue | | <i>cingulata</i> (Fabr.). |
| Hair of mesothorax light blue mixed with
black; abdominal bands very bright
greenish blue | | <i>Walkeri</i> , Ckll. |
| Hair of mesothorax very bright orange-
fulvous mixed with black; light hair on
outer side of hind legs orange-fulvous;
larger than the next species | | <i>emendata</i> Gilberti, Ckll. |
| Hair of mesothorax paler fulvous, inclining
to greenish and mixed with black; light
hair on outer side of hind legs white | | <i>zonata</i> (L.). |

Anthophora scymna, Gribodo.

Described from a single ♀ from Queensland. A ♀ before me is from West Australia, "68. 6."

Anthophora rhodoscymna, sp. n.

♂.—Length about $12\frac{1}{2}$ –13 mm.

Similar to *A. scymna*, but differing thus: tegument of abdomen entirely bright red, with appressed orange hair, that on first segment more erect and with some black intermixed; that on hind margins of segments pale golden, producing faint bands; apex without dark hair; clypeus with a light orange reversed T, the upwardly-directed stem tapering to a point; hair of cheeks abundant and snow-white; of vertex and occiput pale yellowish and mixed with black; of thorax above light yellowish, copiously mixed with black; of pleura pale yellowish; tegulæ apricot-colour; wings stained with brown along the veins; the red legs have orange pubescence, but the thick fringe on each side of hind metatarsus and the long inner anterior fringe of hind tibia are black; the hind femora have short black hair beneath. The fourth ventral segment of abdomen has a conspicuous median tubercle, beset with short ferruginous hair; the fifth segment is deeply emarginate and the apical one ends in two rather short widely separated spines, with a low elevation, pyramidal in outline, between.

Hab. Queensland (*Gilbert Turner*); marked "300 Hy." Three males.

It is not impossible that this is the undescribed male of *A. scymna*, but with the evidence at present available it must be considered distinct.

The species of the group of *A. zonata* are very difficult to classify. Dours, in 1869, recognized only *A. cinctofemorata*, Sichel, with a very strongly punctured abdomen, and *A. zonata* (L.), from Australia, the latter being credited with a number of named varieties. According to the characters given in descriptions, the various named Australian forms may be separated thus:—

- | | | |
|---|----|---------------------------------|
| Size small, usually less than 13 mm..... | 1. | |
| Size larger..... | 3. | |
| 1. Hair of thorax silvery; abdominal bands blue,
with some green | | <i>cinctofemorata</i> , Sichel. |
| Hair of thorax reddish or rufo-fulvous..... | 2. | |
| 2. Bands of abdomen metallic blue; light hair of
legs white | | <i>zonata</i> (L.). |

- Bands bluish white; hair of thorax ruf-fulvous *pulchra*, Sm.
 3. Bands blue or silvery blue; hair of legs on outside ferruginous *emendata*, Sm.
 Bands bluish green or pale blue, not very metallic; hair of legs on outside bluish.... *cingulata* (Fabr.).

A. cinctofemorata is clearly distinct from anything I have seen. The species before me I classify as follows, recognizing that some revision will probably be necessary in the light of fuller information:—

Anthophora zonata (L.).

Three females from Queensland (*Gilbert Turner*, 298) and "Australia, 95.64," agree excellently with *zonata*. Curiously, however, the two males accompanying them, collected in Queensland by Gilbert Turner (297 Hy. and 298), are both of the variety *subcerulea* (Lep.), not hitherto reported from Australia. The one labelled 298 has pale blue bands, the other a sort of greenish white.

Anthophora emendata, Smith.

Queensland (*Gilbert Turner*, 299); 1 ♀, 2 ♂.

The two males differ greatly in size, but they appear to belong to the same species, and the collector has given them the same number. The fifth ventral segment in the male is more strongly emarginate than in *zonata*, so I do not think *emendata* can be a mere colour-variety. Smith describes the female as 6 lines long, and gives good reasons for supposing that Dours's measurement of 18 mm. (under the erroneous name "*cincta*, Fabr.") is a mistake. My female and one of the males are larger than Smith indicates, being about 13 mm. long, but the small male agrees with Smith's measurement. Smith says the female has the clypeus reddish yellow, while Dours says it is marked as in *zonata*; my ♀ agrees with the latter statement. Smith says that the ventral surface of the abdomen has fulvous hair in the middle, white at the sides; Dours says reddish black in the middle, white at sides; my insect has it black in the middle, white at the sides. In view of these discrepancies I will designate my insect var. *Gilberti*, taking the female and large male as typical of the variety.

Anthophora Walkeri, sp. n.

♀.—Length just over 12 mm.

Face-markings &c. agreeing with *zonata*; flagellum, except

at base, ferruginous beneath; hair of vertex and thorax above bluish white very strongly mixed with black, of pleura bluish white, of cheeks and sides of metathorax white, of legs as in *zonata*; abdominal bands strongly metallic, the first emerald-green, the other three paler, with mother-of-pearl tints; tegulæ dark rufous.

♂.—Length about 10 mm.

Face-marks chrome-yellow; clypeus with a large black mark on each side, shaped like a human foot; hair of hind tarsi entirely black; abdominal bands emerald-green, the last two and the third at the sides largely overlaid with white.

Hab. Baudin Island, Long Reef, Western Australia, 2 ♀, 1 ♂, collected by Commander J. J. Walker on the 'Penguin' Expedition.

This exquisite species is appropriately named after its discoverer, whose collections have made such important additions to our knowledge of the Australian insect-fauna. It is nearest to *A. cingulata*, but distinguished by its smaller size and strongly metallic bands, and in the male by the markings of the clypeus. The structure of the male abdomen beneath is nearly as in *zonata*. It is to be remarked that the Australian *A. cingulata*, as described by Dours, does not agree with the Indian *cingulata*, described by Bingham. As the species was originally described from Australia, I take it that the Doursian description pertains to the true *cingulata*, though the length he gives (18 mm.) must be a misprint for 13. Dours says the wings are 10 mm. long, and I find them so in a specimen 13 mm. long.

Anthophora cingulata (Fabr.).

Clare, South Australia (*W. Wesche*); two females taken, Nov. 20, 1904.

The hair on the outside of the front and middle legs is largely bluish green. Froggatt states that this bee is widely distributed over the southern part of Australia (*Tr. Roy. Soc. Austr.*, June 1893).

Anthophora adelaidæ, sp. n.

♂.—Length about 11 mm.

Looks like a variety of *A. zonata* or *pulchra*, but is distinguished as follows: face-marks chrome-yellow; clypeus at upper sides with large foot-like black patches, with the heel very long and the toe very short; hair of head and thorax above as in *zonata*, light fulvous strongly mixed with black;

abdominal bands light yellowish with a sort of greenish tint; fifth ventral segment feebly emarginate, as in *zonata*, but with a large, median, subapical, dull black patch where the sculpture runs in semicircular lines; flagellum ferruginous beneath; legs as in *zonata*.

Hab. Adelaide River (*J. J. Walker*, 890).

Anthophora Salteri, sp. n.

♂.—Length about 11 mm.

Looks just like *A. adelaida*, except that the abdominal bands are dull white, the foot-like marks on the clypeus have a short heel and a long thick toe, and the flagellum is only dull dark brownish beneath. I should hardly venture to separate it but for the entirely different structure of the fifth ventral segment of the abdomen, which has a very broad, deep, rounded emargination, its sides forming nearly a right angle with the margin on each side, which is furnished with two or three short but strong spines.

Hab. Paramatta, N.S.W. (*W. R. Salter*).

PROSOPIS, Fabr.

All the species in the following table have the abdomen blue or green:—

First recurrent nervure meeting first transverso-cubital or entering extreme apex of first submarginal cell; abdomen dark blue ..	1.	
Both recurrent nervures received by second submarginal cell	3.	
1. Large, about 11 mm. long; face with three yellow stripes		<i>alcyonea</i> , Erichs., ♀.
Small, less than 7 mm. long	2.	
2. Face all creamy white below level of antennæ. Lateral margins of clypeus dark; no light supraclypeal mark		<i>albonitens</i> , Ckll.
3. Scutellum and postscutellum yellow		<i>disjuncta</i> , Ckll.
Scutellum and postscutellum not yellow	4.	<i>parallela</i> , Ckll.
4. Tubercles conspicuously marked with yellow or white	5.	
Tubercles not so marked, wholly metallic, or rarely with a median non-metallic greyish band	6.	
5. Large; mesothorax black; face-marks and tubercles very bright yellow		<i>alcyonea</i> , Erichs., ♂.
Smaller; mesothorax green; face-marks and mark on tubercles cream-colour		<i>varicolor</i> , Smith.
6. Head, thorax, and abdomen bright green		<i>perviridis</i> , Ckll.
Abdomen deep blue	7.	
7. Larger; face with three narrow cream-coloured stripes		<i>reginarum</i> , Ckll.
Smaller; face in male all white below antennæ, in female without light markings....		<i>Turneriana</i> , Ckll.

Prosopis alcyonea, Erichs.

Albany, W. Australia (*J. J. Walker*, 4296), 1 ♂; Franklin, Tasmania (*J. J. Walker*, 3469), 1 ♀.

The difference in venation indicated by the above table is not specific, I believe, the insects being so similar in all other respects. The male has the first r. n. nearer the base of the second s.m. on one side than on the other. Erichson described only the female; the male has most of the face bright chrome-yellow, but there is a black band down each side of the clypeus. The lateral face-marks narrow abruptly just above the antennæ and are then continued very narrowly nearly to the top of the eyes. There is a yellow mark in front of the anterior ocellus. The curious shining tubercle at the base of the metathorax is as in the female. Evidently *P. vidua*, Smith, is the male of *alcyonea*, as Smith himself surmised; Smith's type had the venation as in my female.

Prosopis varicolor, Smith.

Townsville, Queensland, 5. 3. 02 (*F. P. Dodd*); also 13. 12. 01 (same collector). Both sexes.

This is evidently Smith's species, but the face-markings are cream-colour rather than white and the punctures of the abdomen are quite strong. The male, not hitherto described, is like the female, but the face-marks are ivory-white, the lateral marks larger and longer, and the much narrower and more elongate clypeus has a large white triangle, occupying the greater part of its disk. The blue and green shades of the abdomen are very brilliant.

Prosopis albonitens, sp. n.

♂.—Length a little over 5 mm.

Very closely and minutely punctured; dark deep blue; light markings ivory-white, with a canary-yellow suffusion on anterior and middle tibiæ. Face below antennæ all shining ivory-white, the white ending between the antennæ in a rounded prominence, but along the orbital margins extending upwards, gradually narrowing to a point, the distance from which to the top of the eye is about as great as the distance of the latter from a lateral ocellus; mandibles and scape in front ivory-white; flagellum brown, pale and yellowish beneath; mesothorax convex, very closely and minutely punctured; hind border of prothorax continued to cover tubercles, but interrupted in middle, white; base of metathorax with a very large area, semilunar in form, with the

ends (sides) shortened, bounded by a sharp ridge, except in the middle line posteriorly; this area is shining and is divided into three subequal parts by two longitudinal carinæ, the lateral spaces being rather obscurely obliquely ridged. Legs piceous brown and yellowish white; femora dark except the anterior knees; tibiæ light, the anterior ones wholly so, the middle ones with a dark spot behind, the hind ones with a very broad, dark, subapical ring; tarsi yellowish white, with the last two joints of the middle and the last three of the hind tarsi pale brown; tegulæ with a white spot in front; abdomen rather narrow, the hardly noticeable fine pilosity white as far as the third segment, after that black.

Hab. Queensland (*Gilbert Turner*, 713, *Ridg.* 11.91).

Prosopis disjuncta, sp. n.

♂.—Length about $6\frac{1}{2}$ mm.

Strongly punctured, but not so closely as in *P. albonitens*, the punctures of the mesothorax in particular being much larger, more irregular, and less dense; dark blue, the head and thorax inclining to steel-blue, the abdomen to deep rich purple; light markings cream-colour or a very pale primrose; wings hyaline, nervures dark. Clypeus light, with a dark margin, this margin varying in breadth, so that the light triangle may be very large or rather small; lateral face-marks broad, bow-shaped, notched above by the antennal sockets; mandibles and scape wholly dark; flagellum brown, yellowish ferruginous beneath; middle of front elevated and rugose, the elevation bounded on each side by a sharp ridge; at each side of this elevation is a smooth shining area; hind border of prothorax and large spot on tubercles light, but the two light areas are not nearly continuous; basal area of metathorax somewhat dumbbell-shaped, broader at the sides than in the middle; tegulæ with a small light spot. Legs dark, slightly metallic; the anterior tibia and metatarsus in front, a small spot at base of middle and hind tibiæ, a very small spot at apex of middle tibia, and short line on its tarsus, yellow; abdomen with the almost imperceptible pilosity white as far as the fourth segment, after that black.

Hab. Queensland (*Gilbert Turner*, 717, *Ridg.* 11.91).
Two.

Prosopis parallela, sp. n.

♀.—Length nearly $8\frac{1}{2}$ mm.

Strongly punctured, the punctures very large and dense

on mesothorax; bright Prussian green, the abdomen a bluer green except near the sutures, the first two segments strongly suffused with purple above; light markings bright chrome-yellow, except those of the head, which are pellucid grey, but one has the upper end of the median facial stripe yellow, and probably the markings should all be of that colour when fully mature; wings hyaline, nervures dark. Head elongated, the facial quadrangle nearly twice as long as broad; inner orbital margins above gently concave; mandibles wholly dark, strongly ridged; light markings of head consisting of a stripe behind the eyes and three nearly parallel stripes on the face, the middle one going up to the middle ocellus, the lateral ones failing a short distance before top of eye; scape long and wholly dark; flagellum ferruginous beneath; hind border of prothorax (continuous in middle, but not reaching tubercles), tubercles, spot on tegulae, triangular spot just below wings, scutellum and post-scutellum (except lateral corners) all yellow; basal area of metathorax triangular, not bounded by a ridge, but abruptly defined by the absence of punctures, finely shagreened, shining green, appearing purplish in some lights; legs brown-black, a light yellow spot at base of anterior and middle tibiae; apex of abdomen with black hairs. The base of the metathorax is radically different from that of *P. disjuncta* and *P. albonitens*, but is of quite the same type as that of *P. varicolor*, which is closely allied.

Hab. Queensland (Gilbert Turner, 852, Ridg. 11.93, and 272 Hy.). Two.

Prosopis perviridis, sp. n.

♀.—Length about 8 mm.

Strongly punctured, the punctures of the mesothorax well separated on a shining ground; brilliant green, even including the legs, except the tarsi, the metallic colour of which is purplish; wings hyaline, with dark nervures. Head broad and not especially long; mandibles and scape dark, flagellum ferruginous beneath; median and lateral stripes on face and stripe behind eyes light chrome-yellow; the median stripe is expanded on clypeal margin to look like the head of a nail in profile; in the supraclypeal area it is represented by a round mark, and above that it is shaped like a spear-head, not reaching the ocellus; the lateral stripes have a linear extension to the top of the eyes; hind border of prothorax with two yellow stripes, but tubercles wholly green; a small light yellow spot just beneath the wings and a streak on axillae; tegulae green in front, with no light

spot; scutellum and postscutellum broad and flattened, the former shining, with widely separated punctures; basal area of metathorax triangular, large, smooth and shining, bounded by a groove; anterior and middle tibiæ marked with yellow at base; abdomen rather broad, the apical segments strongly retractile; the abdomen recalls that of a *Ceratina*.

Hab. Adelaide River (*J. J. Walker*, 5759). Collected on the 'Penguin' Expedition.

Prosopis reginarum, sp. n.

♀.—Length nearly 10 mm.

Strongly punctured, the punctures on the mesothorax close; deep blue, with purple tints, the mesothorax greenish blue; light markings cream-colour; wings rather dusky, nervures dark. This has in general the structure and markings of *P. perviridis*, but it not only differs in its deep blue colour, darker wings, and more closely punctured mesothorax, but also as follows: flagellum wholly dark; no light stripe on axillæ; median facial stripe not reaching far above antennæ, the spear-head mark divided by a dark line. The apical part of the abdomen has long coarse black hair. The tubercles are fringed with white pubescence, and have a minute, hardly visible, light spot.

Hab. Queensland (*Gilbert Turner*, 270 Hy.).

Prosopis Turneriana, sp. n.

♂.—Length 8–9 mm.

Strongly punctured, the punctures very dense on the mesothorax; head and thorax bluish green, with purple tints; abdomen deep shining blue, with purple tints; anterior coxæ purple, but their femora olive-green; metallic tints of middle and hind legs purplish blue; wings dusky at apex, nervures dark. Head ordinary; face below antennæ white, the white ascending only a short distance above in the middle line, giving way to a groove which ascends to the middle ocellus; lateral marks ending very broadly and bluntly about halfway between the antennæ and the top of the eyes; labrum with a light spot; mandibles with a small light stripe; scape creamy white in front, flagellum dull ferruginous beneath; enclosure of metathorax triangular, shining, of the type of *P. varicolor*; no yellow or white marks on thorax; tubercles shining reddish purple; tegulæ with a light spot in front; anterior and middle tibiæ light yellow in front; apex of abdomen with two short widely separated teeth; last three ventral segments strongly tufted

with black. The hind tibiae may have a cream-coloured stripe on basal half. The face-markings in the specimens described are more or less discoloured.

♀.—Similar, but the face is without light markings and the area in front of the ocelli is brassy.

Hab. Queensland (*Gilbert Turner*, 383 Hy., males, and 269 Hy., females). Two of each sex.

The mouth-parts of this species seem not to be those of true *Prosopis*; it is probable that the Australian species assigned to this genus should form the basis of one or two new genera, but I do not feel able to offer a plan of segregation just at present.

Prosopis Lubbocki, n. n.

Prosopis metallica, Smith, Trans. Ent. Soc. Lond. 1862, p. 59 (Australia, in coll. of J. Lubbock), ♂, not ♀.

It seems very unlikely that the insects described as the sexes of *P. metallica* are conspecific, and it will probably cause less confusion if the male is separated under the above name.

Prosopis Frederici, n. n.

Prosopis similis, Smith, Cat. Hym. Brit. Mus. 1853, p. 26 (Australia). Not of Fabricius, 1793.

Prosopis Cameroni, n. n.

Prosopis sulcifrons, Cameron, Mem. Manchester Soc. 1897, p. 51 (New Zealand). Not of Smith, 1853.

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Boulder, Colorado, U.S.A.,
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