59.57, 99(801)

Article XI.—SOME NEOTROPICAL MELIPONID BEES

By T. D. A. Cockerell

The following report deals with a series of meliponid bees belonging to The American Museum of Natural History. Those from British Guiana and Brazil were collected by H. E. Crampton and Frank E. Lutz of the Department of Invertebrate Zoology expedition to Kaieteur Falls and Mt. Roraima in 1911. Their notes concerning the various collecting places are given at the end of this article.

Melipona fasciata barticensis Cockerell

What was intended to be the original description of this insect was published in 1919, Proc. U. S. National Museum, LV, p. 200, but a later manuscript containing a description was published earlier, 1918, Bull. Amer. Mus. Nat. Hist., XXXVIII, p. 688. The 1918 paper will have to be considered as the original description and the Penal Settlement, Bartica, British Guiana, specimen as the type. The present specimens were collected in the Kaieteur region of British Guiana from the forest (Lutz, Aug. 13) and also from the open savannah (Crampton, July 21).

Melipona fasciata cramptoni, new subspecies

Worker.—Clypeus reddish with a creamy white median stripe and the lateral corners broadly of the same color; inner orbits with a narrow cream-colored band, failing above, and the area mesad of the band more or less reddish; scape with a ferruginous stripe, sometimes distinct only on the lower half; hair of front mixed pale fulvous and dark fuscous, of vertex and occiput mainly ferruginous but partly fuscous, especially at sides; scutellum and axillæ pale yellow; thorax dorsally and upper half of pleura with bright ferruginous hair, becoming dark reddish brown (some of the hairs nearly black but the general effect a warm, rich color) on upper part of mesopleura, anterior corners and posterior middle of mesothorax, and disc of scutellum; lower part of pleura with white hair; wings dusky; legs bright ferruginous; abdomen black, with narrow, entire, pale bands.

The specimens came from an "island" of forest in the wide upper savannahs on the Paiapalu Creek, northern Brazil, August 13 and 15. Their nest was in a hollow of a dead tree. The honey was medium golden in color and somewhat acrid. (Crampton.)

This is a distinct race, differing as follows from related forms:

From *M. fasciata panamica* Ckll. by the distinct pale face markings, red hair of vertex, clear red legs, and darker stigma.

From *M. fasciata costaricensis* Ckll. by the bright fulvous hair of head and thorax above, as well as by other characters.

From *M. fasciata barticensis* Ckll. by the brownish tint of part of the thoracic hair, duskier (less yellow) wings, darker stigma, and more distinct face-markings.

As compared with the other forms of *fasciata*, *cramptoni* seems distinctly more robust.

Melipona interrupta oblitescens Cockerell

British Guiana.—Tumatumari; July 11; (Lutz). Tukeit; July 17 and 21. A snake had been killed and skinned the 15th. *Trigona recursa* was very abundant at the carcass on the 16th and, on the 17th, both *Trigona pallida* and *Melipona interrupta oblitescens* were collected there. Apparently they not only sucked the fluids but also carried off small bits of the flesh. Diptera were relatively rare about the carcass (Lutz). Kaieteur; July 19 and 21; (Crampton).

Brazil.—Near the Cotinga River, August 9; (Crampton).

These are the first exact locality records for this form, which was described (1919, Proc. U. S. Nat. Museum, LV, p. 205) from a specimen labelled "Surinam."

Melipona lateralis Erichson

In 1848, in Schomburgk's work on British Guiana, p. 592, Erichson described a new bee as *Melipona lateralis*. I am indebted to Dr. Lutz for a copy of the description, of which the following is a translation.

Allied to *M. favosa*. The head black, front and vertex black-haired; the clypeus anteriorly red-brown in the middle with a yellow longitudinal line; antennæ brown-red beneath, black above; mesothorax and scutellum black-haired; sides of thorax with thick yellow pubescence, but beneath and on metathorax it is gray. Abdomen aboves hining black, rather bare, the first segment red-yellow, the following four with an apical yellow band; the venter yellow, with short gray hair; legs black, black-haired; wings yellowish hyaline.

This species, which has been ignored since its publication, or at most merely cited from the original reference, is obviously a true *Melipona*. It is to be compared with *M. quadrifasciata* Lep. and *M. intermixta* Ckll. The hair of the thoracic dorsum is described as black, without qualification, and this points to *M. quadrifasciata*. If, however, we allow for a certain amount of inexactness, the description applies well to *M. intermixta*, which is more likely to have been collected in the region from which *lateralis* came. The description of the clypeus is excellent for *intermixta*, but there is no mention of light stripes along the orbits. On the whole, I believe that *M. lateralis* is the valid and prior name for *intermixta*, but it probably applies to a race differing in some respects from those at present known. In that case the nomenclature will be:

Melipona lateralis lateralis Erichson.
Melipona lateralis intermixta (Ckll.)
Melipona lateralis kangarumensis, new subspecies.

Melipona lateralis kangarumensis, new subspecies

Worker.—Like *intermixta* but the ground-color of the abdomen is clear ferruginous. It is larger than *M. quadrifasciata callura* Ckll., and the abdomen is clear red at the base.

British Guiana.—Kangaruma, the type locality, July 13; also August 18 in the forest near this place; (Lutz). Four specimens.

Brazil.—Savannah a little west of Brazilian border and Ireng River (barometric reading, 3450 feet) and also in a small patch of forest in the upland savannahs (barometric reading, 4000 feet) near Mt. Weitipu; August 7 and 15; (Crampton). The two specimens from the lower savannah have the abdominal bands inconspicuous and look different. They are, perhaps, not quite mature, and one has the bands reddened by cyanide.

Melipona pseudocentris Cockerell

Kangaruma, British Guiana; July 13; (Lutz). This species was previously known only from Brazil (Cockerell, 1912, Psyche, XIX, p. 47, and, 1919, Proc. U. S. Nat. Museum, LV, p. 202).

Trigona fulviventris Guérin

Guatemala; December 1908; (Engelhardt). The specimens are from the Zabriskie Collection, which is deposited in the American Museum. The species ranges from Mexico to Brazil. Its absence from the British Guiana collection is surprising, as it is so very abundant in many other neotropical regions. The U. S. National Museum has it from Cacao, Trece Aguas, Guatemala, (G. P. Goll); S. Antonio, Nicaragua; Sonsonate, Salvador, (F. Knab); Esparta, Costa Rica, (F. Knab); Pozo Azul, Costa Rica, (Carriker); Cordoba, Mexico, (F. Knab); and the following localities in the Panama region: Las Cruces (Busck), Porto Bello (Busck), Alafaela (Jennings), Gatun (Jennings), Paraiso (Busck), Alhajuelo (Busck), and Cabima (Busck).

Trigona jaty Smith

Ollas de Moka, Guatemala; December 5, 1908; (Engelhardt); also from the Zabriskie Collection. This species was described from Brazil (I have seen it from Pará) and has been previously reported from Guatemala but not elsewhere. Specimens in the U. S. National Museum come from San José, Guatemala (F. Knab); Tabernilla, Canal Zone,

Panama (Busck); Pozo Azul, Costa Rica (Carriker); and Nicaragua. Some of the Nicaragua specimens have the abdomen dark. *T. varia* Lepeletier resembles *T. jaty*, but is larger (anterior wing 7 mm. long), and the face is broader. It occurs in Brazil.

Trigona bipunctata wheeleri Cockerell

Guatemala; December 3 and 5, 1908; (Engelhardt); from the Zabriskie Collection. This form has been confused with *T. mexicana* Guérin; but the latter, as I understand it, is distinct (cf. Trans. Amer. Ent. Soc., XXXI, p. 323). The specimens from Guatemala in the U. S. National Museum, determined by Friese as *mexicana*, do not agree with *mexicana* as named in the British Museum. As far as known, *wheeleri* has not been found outside of Guatemala.

Trigona frontalis Friese

Environs of Guadalajara, State of Jalisco, Mexico; (Diguet). Previous records are from Honduras, Nicaragua, Guatemala, and Ecuador. A variety, *flavocincta* Cockerell, occurs in Guatemala and Brazil, and was taken by A. Busck at Paraiso, Canal Zone, Panama, January 28.

Trigona clavipes (Fabricius)

British Guiana.—Rockstone; July 9; (Lutz). Tumatumari; July 11; (Crampton and Lutz). Potaro Landing; August 18; (Lutz). Saveritik near the Ireng River; open spaces in an Indian village; August 5; (Crampton). This species has been previously reported from Brazil and Uruguay.

Trigona williana Friese

British Guiana.—Rockstone; July 9; (Crampton). Kaieteur; forest; August 12; they chew up human excrement and deftly pat it into balls on their hind legs; (Lutz). Saveritik; August 5; (Crampton).

Brazil.—Open savannah west of Cotinga River; August 17; (Crampton).

I now find that I was in error in separating *T. rhodoptera* (1912, Psyche, XIX, p. 49) from *T. williana* Friese (1900, Termés Füzetek, XXIII, p. 388). I have since seen authentic *williana* in the U. S. Nat. Museum and have compared it with my type of *T. rhodoptera*, which I have placed in the Museum. *T. williana* is known from Dutch Guiana and Brazil; *rhodoptera* has been previously reported only from the original material collected by Mann and Baker on the Rio Madeira, Brazil.

The following table, based on specimens in the U. S. Nat. Museum, separates a series of species in which the mesothorax is all red.

1. Hind tibiæ with more than the apical half fuscous, the base pallid; abdomen mainly reddish fuscous; specimen from Pará, Brazil....*rhumbleri* Friese.
   Hind tibiæ clear red.....2.
2. Wings milky whitish; abdomen narrow; specimens from Bolivia and Pará, Brazil. *dallatorreana* Friese.
   Wings reddish or dusky.....3.
3. Smaller, anterior wing about 6 mm.; thorax wholly red; specimen from Brazil. *pallida* (Latreille) = *kohli* Friese.
   Larger, anterior wing about 8.5 mm.; specimen from Brazil....*williana* Friese.

Specimens in the U. S. Nat. Museum from Tarata, Bolivia, also marked *kohli* by Friese, belong to quite another species.

Trigona heideri Friese

British Guiana.—Potaro Landing; August 18; (Lutz). Amatuck; August 17; (Lutz). Chenapowu Creek; at flowering bushes along the stream; July 31; (Crampton). This species belongs in the subgenus *Tetragona* and was described by me as *T. manni* from material collected by Mann and Baker on the Rio Madeira, Brazil (Cockerell, 1912, Psyche, XIX, p. 48). I have found by comparison with specimens determined by Friese that *T. manni* is identical with *T. heideri* Friese (1900, Termés Füzetek, XXIII, p. 389), which was described from Brazil, Peru, and Colombia, its varieties or subspecies extending its distribution to (*mocsaryi* Friese) Dutch Guiana and (*occidentalis* Schultz) Ecuador. The variety or species *mocsaryi*, of which I have seen authentic material from Pará (U. S. N. M.), is easily distinguished by the red hind tibiæ, lacking dark markings. It has the anterior wing about 8 mm. long, orange tinted, with the apical margin broadly pale gray. The *occidentalis* form has the dorsum ferruginous or yellowish; I have not seen it.

Trigona pallida (Latreille)

British Guiana.—Rockstone; July 9; (Lutz). Tumatumari; July 11; (Lutz). Tukeit; July 16–19; at a snake carcass (see *Melipona interrupta oblitescens*) and called "colatakwa" by our Patamona Ackawoi Indians (Lutz); also flying to jam in the camp tent (Crampton). Kaieteur; July 19 to August 5; at the caracass of a monkey; (Lutz).

These specimens agree with a specimen from F. Smith's collection, determined by him as *pallida*. The insect in the U. S. National Museum from Peru and determined by Ashmead as *pallida* is quite different, falling with or very near to *goettei* Friese. *T. kohli* Friese is identical

with *T. pallida* as understood by Smith and here recognized. *T. pallida* was originally known from Frensh Guiana and has since been reported from Brazil; *kohli* was described from French and Dutch Guiana, Brazil, Peru, and Colombia; these are the first records from British Guiana. Specimens in the U. S. National Museum collected by Busck in the Panama region (Tabernilla, La Chorrera, Rio Trinidad and Alhajuelo) are a little darker, with darker wings, than Brazilian *kohli*, but hardly seem to constitute a distinct race.

Trigona musarum Cockerell (? *rhumbleri* Friese)

From the forest east of the Cotinga River, Brazil; barometric reading, 4000 feet; August 10; (Crampton).

The three workers in this collection differ from typical *musarum* by having the hind tibiæ dark fuscous except basally, and the hind basitarsi also dark, while the middle basitarsi are inclined to be darkened. This brings it close to *T. rhumbleri* Friese; but Friese's two-line description is hard to interpret, as he compares the species with *pallida* and we do not know what his "*pallida*" was. I saw authentic *rhumbleri* in the U. S. National Museum, but did not make comparisons with *musarum*. Should they prove forms of one species, *musarum* will stand as a subspecies. *T. rhumbleri* is known from Brazil, Peru, and Colombia; *musarum* from Costa Rica and Panama.

Trigona cupira Smith

There are specimens collected by C. F. Davis in Panama and by C. Werckele at Pacayas, Costa Rica. The species has been previously reported from Costa Rica, Guatemala, and Brazil. In the Panama region it has also been taken at Cabima (Busck) and Porto Bello trail (A. H. Jennings).

Trigona recursa Smith

British Guiana.—Tumatumari; taken by sweeping in a grass field, July 11; (Lutz). Potaro Landing; August 18; (Lutz). Kangaruma; July 13; (Lutz). Tukeit; at the carcass of a snake (see *T. pallida*); July 16; (Lutz). Kaieteur; both in the forest and on that part of the open savannah where there was either bare rock or very few grasses and small, low flowers; July 30 to August 5; some of those from the forest were at the carcass of a dead monkey and others at fleshy flowers which had fallen to the ground from the high trees along the river; (Lutz). Saveritik; at flowers in an open clearing on the border of the Ireng River; August 5; (Crampton).

Most of the very numerous specimens came from the Tukeit dead snake that seemed to be popular with both genera of Meliponidæ. I have one of F. Smith's specimens of *recursa* for comparison. The long hair on the mesothorax and scutellum distinguish it from what I have identified as *T. stigma* Smith. The species is given as "*recurva*" in Dalla Torre's catalogue and was previously known only from Brazil.

Trigona amalthea (Olivier)

British Guiana.—Rockstone; July 9; (Lutz). Potaro Landing; August 18; (Lutz). Kangaruma; July 13; (Lutz).

This species ranges from Mexico to Ecuador and Brazil. Gaige had taken it at Dunoon, British Guiana (see Cockerell, 1916, Occ. Papers. Mus. Zool., University of Michigan, No. 24). *T. fuscipennis* Friese is a synonym.

In the U. S. National Museum is a piece of bark of the "Mulungú tree," obtained by Branner and Koebele in 1883 at "Bnito, Prov. Pernambuco," Brazil. On it are some homopterous insects (*Æthalion reticulatum* Fb., variety, det. Heidemann), exactly the color of the bark. These are attended by *Trigona amalthea* and two species of beetles (det. Barber) of the genus *Conotelus* and *Cryptorhopalum*.

Trigona ruficrus corvina Cockerell

Tumatumari, British Guiana; July 11; (Lutz). The typical form is known from Guatemala, Brazil, and Paraguay; *corvina* was previously recorded from Guatemala, Costa Rica, and Panama.

Trigona townsendi Cockerell

This is not in the collection sent, but I take the opportunity to record a series of new localities for specimens in the U. S. National Museum. Alhajuelo, Canal Zone, Panama; March 12; (Busck). Escuintla, Guatemala; (F. Knab). Cacao, Trece Aguas, Guatemala; (Schwarz and Barber). Boruca, Costa Rica; July; (M. A. Carriker).

Trigona subgrisea, new species

Worker.—Length about 5.5 mm., anterior wing 5.5 mm.; black, the abdomen and legs faintly reddish; mandibles edentate, reddened apically; head large and broad, shining; face with thin pale hair, not conspicuous; front and vertex with ochreous-tinted hair; extreme base of antennæ fulvous, but scape otherwise black; flagellum black, obscurely brown beneath; thorax with pale ochreous-tinted hair, fulvous on scutellum; mesothorax and scutellum polished and shining; tegulæ testaceous, with a large dark spot; wings hyaline with grayish dusky tips, nervures on basal half bright clear orange-ferruginous; legs with reddish hair, but white tomentum on inner side of basal half of hind tibiæ; hind tibiæ only moderately broad, the fringing hairs pale

reddish; abdomen shining, rather narrow, the margins of fourth and fifth segments, and sixth segment, with more or less evident pale brownish hair, the ventral surface with white hair.

East of the Cotinga River, Brazil; August 10; (Crampton). Two workers, one in bad condition.

In my manuscript table this runs nearest to *T. leucogastra* Ckll., from Ecuador, but it is easily separated by the color of the hair on thorax.

Trigona pura, new species

Worker.—Length about 6 mm., anterior wing about 6 mm.; black, with yellow face-markings, scutellum pale honey-color, first abdominal segment pale reddish, second brownish black, pallid at anterior lateral corners; legs dark reddish, the anterior femora pallid basally, the others more extensively, the tarsi pale reddish apically. Head ordinary, face and front brilliantly shining; mandibles edentate (except for the inner notch), the apical half ferruginous; face and front with thin pale hair, vertex with fulvous; face-markings consisting of a broad median band on clypeus (narrowed above and crenulate at sides), a little marginal spot on each side of clypeus, broadly triangular supraclypeal mark, and rather narrow bands (broadest below) along inner orbits to the summits; scape long, yellow in front, behind pale red with a dark spot at apex; flagellum dark reddish above, paler beneath, with a lighter spot on each segment; mesothorax and scutellum shining; thorax above with abundant fulvous hair; upper border of prothorax with a yellow (tegumentary) band; hind tibiæ not very broad; tegulæ pale testaceous; wings clear hyaline, distinctly milky, stigma and nervures pale orange-ferruginous; abdomen long and narrow, highly polished, apex above with fuscous hairs.

Kaieteur, British Guiana; July 21; (Crampton). One worker. Looks muck like *T. clavipes* (Fabr.), but easily known by the face-markings and other characters.

Trigona droryana Friese

In the U. S. National Museum are specimens from Rio Janeiro, Brazil, labelled *T. droryana* Friese and *T. mosquito* Smith by Friese. The *droryana* have the tegulæ testaceous, and scape pale in front to apex; the *mosquito* have the tegulæ rufofuscous, and the scape in front black apically. After close study, I concluded that these were merely forms of a single species, very easily recognizable by the small size, mesothorax shining, axillæ pale, scutellum pale-margined, anterior and middle tibiæ red, hind margins of abdominal segments black.

The insect recognized as *T. mosquito* by Friese is widespread, having been taken at Acapulco, Mexico (F. Knab) and Cacao, Trece Aguas, Guatemala (Goll). Smith described his *T. mosquito* as having the abdomen entirely pale, scutellum pale, etc. It surely cannot be identical with the species so determined by Friese. Whether *T. emerina* Friese

is the true *T. mosquito*, as Marianno indicates, I cannot say. It has the pale scutellum, but the abdominal segments are dusky-margined. Specimens of *T. emerina* from Brazil, determined by Friese, are in the U. S. National Museum. They are totally distinct from *droryana*, and belong to the group of very small species, in which *emerina* is known by the shining mesothorax (dull in *T. schrottkyi* Fr.) and clypeus dark (pale in *T. goeldiana* Fr. and *duckei* Fr.).

For the present, at least, the species above recorded from Mexico and Guatemala must stand as *droryana*.

Stations in British Guiana and Brazil

ROCKSTONE, British Guiana. On the Esequibo River. Barometric reading, about 50 feet. The meliponids came from an open, sandy flat. The vegetation was sparse and xerophytic.

TUMATUMARI, British Guiana. On the Potaro River. The specimens reported on here came from a relatively dry and level area along the river. The chief vegetation was grass, weeds, and low bushes. The surrounding vegetation was forest.

POTARO LANDING, British Guiana. On the Potaro River above Tumatumari. The collecting area was sandy country with sparse vegetation (somewhat less xerophytic, however, than at Rockstone) along the river and for about two miles inland. It was bordered by forest.

KANGARUMA, British Giuana. On the Potaro River about six miles above Potaro Landing. A clearing made some time ago and now rather grown up.

AMATUK, British Guiana. On the Potaro River above Kangaruma. Barometric reading, 250 feet. A small recent clearing in the forest at the river's edge.

TUKEIT, British Guiana. In the gorge of the Potaro River five miles below Kaieteur Falls. Barometric reading, about 275 feet. A small clearing in the forest at the river's edge and along paths and in open places among the tall forest trees.

KAIETEUR, British Guiana. On the Potaro River above the falls on the plateau. Barometric reading, about 1325 feet. There are two types of country here: (1) the open savannah with low vegetation, scattered trees and the giant, terrestrial bromeliads; and (2) the rain-forest. The things recorded from the forest came from the relatively dry portions, especially from open glades near the river.

CHENAPOWU CREEK, British Guiana, a small affluent of the Potaro River, about 30 miles west of Kaieteur. The specimens were taken on bushes bordering the streams, where there were no high forest trees.

SAVERITIK, an Indian settlement on the Guiana side of the Ireng River, which separates British Guiana and Brazil. The specimens of *T. recursa* and *T. clavipes* were taken on flowering plants and near the village clearing, while *T. williana* was taken in the neighboring forest.

COTINGA RIVER, Brazil. *M. oblitescens* from forest on the eastern divide of the Cotinga Valley. Barometric reading, 4400 feet. *T. musarum* was taken in forest on the higher eastern borders of the Cotinga River valley. Barometric reading 4000 feet. *T. subgrisea* and *M. oblitescens* were secured in forest areas of a town level. Barometric reading, 2500 feet. *T. williana* was taken on the open savannah a little west of the Cotinga River. Barometric reading, 2500 feet.

KANAIRENG RIVER, Brazil, a small river running southward about 12 miles west of the Ireng River and the Brazilian border. The specimens were taken on the open savannah. Barometric reading, 3450 feet.

MT. WEITIPU, Brazil. Small patch of forest in the upland savannahs at the base of Mt. Weitipu. Barometric reading, 4000 feet.

PAIAPALU CREEK, a small branch of the Arabopo River, Brazil. The specimens were taken in an "island" of forest, surrounded by open savannahs. Barometric reading, 4000 feet. The bees were taken from the nest in the hollow of a dead tree, as well as from the natives' hair and on the wing. The honey was acrid, and golden brown in color. The "cells" were made of chocolate-brown wax, and were globes about one or one and a half inches in diameter.