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THE SOCIAL BEES OF THE PHILIPPINE ISLANDS

By T. D. A. COCKERELL

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The social bees of the Philippines are included in three families, easily distinguished as follows:

Anterior wings with reduced venation; small, stingless bees.... **Meliponidæ.**
Anterior wings with three submarginal cells; larger bees, with sting in females and workers..... 1.
1. Eyes hairy; marginal cell long (honey bees).....**Apidæ.**
Eyes naked; large hairy bees (humble bees)..... **Bombidæ.**

MELIPONIDÆ

A large family of social bees, abundant in the tropics of both hemispheres, but absent from the temperate parts of the northern hemisphere, though extending south of the tropics in Australia. The only Philippine genus is the following:

Genus **TRIGONA** Jurine

The record of *T. læviceps* Smith is probably erroneous. The following species are known to occur:

Base of abdomen bright ferruginous, the following segments intense black, abruptly contrasting ..... palavanica Cockerell.
Abdomen not thus bicolored..... 1.
1. Larger, the worker 6.5 to 7 millimeters long; abdomen ferruginous. luteiventris Friese.
Smaller, worker about 3.75 millimeters long; abdomen dark. biroi Friese.

Trigona palavanica Cockerell.

Trigona palavanica COCKERELL, Ann. & Mag. Nat. Hist. (1915), VIII, 16, 2.

PALAWAN, Puerto Princesa (from *Baker*).

Trigona luteiventris Friese.

Trigona luteiventris FRIESE, Résult. L'Expéd. Sci. Néerlandaise à la Nouvelle-Guinée. Leiden (1900), 5, Zoologie, 358.

PALAWAN; also Perak.

Trigona biroi Friese.

Trigona biroi FRIESE, Termés. Füzetek (1898), 21, 429.

Philippines and New Guinea, according to Friese. Philippine Islands (*C. R. Jones*).

LUZON, Los Baños (*Baker*): Bataan, Lamao (*P. J. Wester*), at flowers of *Nipa fruticans*, February 26, 1916.

I take the opportunity to make known some species obtained by Professor Baker in Penang and Singapore:

Trigona ambusta sp. nov.

Worker.—Length, 8.5 millimeters; anterior wing, 8 millimeters. Head large, shining black, the clypeus ferruginous, broadly suffused with dusky above and at sides; antennæ dark, except basal third of scape, which is bright ferruginous; mandibles simple; front with fine brown pruinose tomentum; a band of stiff black hair behind ocelli; mesothorax and scutellum ferruginous, the latter with two dark marks and the mesothorax with dusky lines anteriorly; surface of mesothorax with very short thin rich fulvous tomentum, and anteriorly with black hairs; scutellum with short stiff black hairs; metathorax hairy at sides, but the broad central portion polished, shining black; pleura black in middle, reddish around sides, and red below; tegulæ castaneous; wings fuliginous, with the apical field broadly reddish hyaline; stigma and nervure dusky reddish; legs black, the coxæ and trochanters red; abdomen black (extreme base of first segment red), narrow, compressed, shining, with dark hair at apex.

SINGAPORE (*Baker 9067*). Allied to *T. lacteifasciata* Cameron, from Borneo, but with black femora, basal part of wings dark, and other differences. It is also related to *T. thoracica* Smith, differing in the color of the wings, which Smith describes as flavo-hyaline in his species.

Trigona atripes Smith, a variety differing a little in the color of the legs, comes from Penang Island (*Baker 9068*). The following species with black head and thorax were obtained by Baker on Penang or at Singapore:

Mesothorax dull, bordered with fulvous hair (Penang). fulvomarginata sp. nov. (9073).
Mesothorax not thus bordered ..... 1.
1. Small species, with red scape ..... 2.
Larger species; scape black, at most red at extreme base ..... 3.
2. Tegulæ ferruginous (Singapore) ..... valdezi sp. nov. (9074).
Tegulæ black (Penang) ..... penangensis sp. nov. (9075).
3. Larger; transverse-cubital nervures barely indicated (Singapore). busara sp. nov. (9072).
Smaller; transverse-cubital nervures distinct ..... 4.
4. Scutellum bare (Penang) ..... bakeri sp. nov. (9069).
Scutellum conspicuously hairy (Singapore). itama sp. nov. (9071=type; 9070).

Trigona fulvomarginata is very close to *T. ventralis* Smith and has the abdomen whitish at base and beneath as in *ventralis*. It differs by the dusky wings and the bright fulvous hair bordering mesothorax and scutellum. The scape is pale at the extreme base, and the face has short grayish white hair.

Trigona valdezi and *penangensis* belong to the *iridipennis* and *biroi* series. They differ at once from *iridipennis* by the dusky wings. The wings of *penangensis* are less produced apically than those of *iridipennis*, and the abdomen is pure black. *Trigona biroi* is larger than *penangensis* and has darker wings. *Trigona valdezi* is 5 millimeters long, but *penangensis* is not over 4. The abdomen of *valdezi* is brown, palest basally; that of *penangensis* is pure black. *Trigona valdezi* is also close to *T. læviceps* Smith, but differs by the black femora, tibiæ, and middle and hind basitarsi.

Trigona busara is about 7 millimeters long, robust, with dusky wings; stigma and nervures dilute sepia; face and front covered with cinereous pile; scutellum with much black hair; pleura with mouse-colored tomentum above, grading into cinereous below; legs black.

Trigona bakeri and *T. itama* are much alike, about 6 millimeters long, with dilute fuliginous wings, noticeably darker than those of *T. busara*. The front mesothorax and abdomen are shining, but in *bakeri* the mesothorax is extremely smooth and polished, in *itama* distinctly dullish. The legs are black in both. *Trigona busara, bakeri,* and *itama* all have the abdomen shining black.

The following, described by Smith from Singapore, are not represented in the collection: *Trigona fimbriata, T. læviceps,* and *T. thoracica*. Smith described four others from Mount Ophir; one of them (*T. atripes*) was found on Penang. It is a fulvous insect, quite unlike the others here described.

APIDÆ

I recognize only a single genus, though the segregates proposed by Ashmead may be considered subgenera.

Genus APIS Linnæus

Large species, workers about 16 to 18 millimeters, with eyes somewhat converging above; second recurrent nervure joining third submarginal cell very near its apex..... Subgenus Megapis Ashmead.

Medium-sized species, typified by the common honey bee; second recurrent nervure not going so near end of third submarginal cell.

Subgenus Apis Linnæus.

Small species, workers about 8 millimeters..... Subgenus Micrapis Ashmead.

Subgenus Megapis Ashmead

Basal half of abdomen clear ferruginous..... dorsata Fabricius.
Abdomen black, with a band of white tomentum at base of second segment. binghami Cockerell.

Subgenus Apis Linnæus

Length of worker, 10 to 13 millimeters; labrum black..... mellifera Linnæus.
Length of worker, 9 to 11 milimeters; labrum and more or less of clypeus pale reddish..... indica Fabricius.

Subgenus Micrapis Ashmead

One species; labrum and clypeus dark..... florea Fabricius.

Apis dorsata Fabricius.

Apis dorsata FABRICIUS, Ent. Syst. (1793), 2, 328.

Listed by Ashmead.

Apis binghami Cockerell.

Apis binghami COCKERELL, Canad. Entom. (1906), 166 (*zonata* Smith, preoccupied).

LUZON, Mount Banahao (*Baker*); Bacoor (*P. L. Stangl*); reported by Ashmead.

Apis mellifera Linnæus.

Apis mellifera LINNÆUS, Syst. Nat. (1758), 10, 576 (later called *mellifica* by Linnæus).

Presumably occurs only as a domesticated insect.

Apis indica Fabricius.

Apis indica FABRICIUS, Ent. Syst. Suppl. (1798), 274.

LUZON, Los Baños. MINDANAO, Dapitan (from *Baker*). The Philippine specimens seen by me have the abdomen banded conspicuously with black, and belong to the race *nigrocincta* Smith. The form *unicolor* Latreille, with black abdomen, has been reported by Ashmead from Cagayan and Alcala. Ashmead reports *nigrocincta* from Manila (*Stanton*).

Apis florea Fabricius.

Apis florea FABRICIUS, Mant. Ins. (1787), 1, 305.

Said to occur in the Philippines. I have none from the Islands.

BOMBIDÆ

Genus BOMBUS Latreille

Body covered with pale hair, some black intermixed on abdomen; wings hyaline ..... **mearnsi Ashmead.**

Hair of head nearly all black, of thorax above black, but on pleura fulvous; abdomen with first two segments yellow-haired, the others with black; wings fuliginous..... **irisanensis** Cockerell.

Bombus mearnsi Ashmead.

Bombus mearnsi ASHMEAD, Proc. U. S. Nat. Mus. (1905), 28, 959; COCKERELL, Ann. & Mag. Nat. Hist. (1905), VII, 16, 393.

MINDANAO, Mount Apo, 6,000 feet (*E. A. Mearns*). Type in United States National Museum.

Bombus irisanensis Cockerell.

Bombus irisanensis COCKERELL, Ann. & Mag. Nat. Hist. (1910), VIII, 5, 416.

LUZON, Benguet, Irisan (collector unknown). Type in British Museum. Structurally resembles *B. sumatrensis* Ckll., from Sumatra, but the colors are quite different. *Bombus* is known from Java (*B. rufipes* Lep.), Sumatra (*B. senex* Snell., *B. rufipes melanopoda* Ckll., and *B. sumatrensis* Ckll.), and the Philippines; but not yet from Borneo.

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