

LARVÆ OF MEMBRACIS SERVING AS MILK-CATTLE TO A BRAZILIAN SPECIES OF BEE

MY letter in NATURE, vol. viii. p. 201, was incomplete so far as the names of the Brazilian insects alluded to are concerned, but I am now enabled accurately to name both the supposed milk-cow and the supposed milker. With regard to the former, Mr. Rogenhof, of Vienna, has had the kindness to compare my specimens of *Membracis* with the collection in the museum of that metropolis, and informs me that my *Membracis* belongs to the genus *Potnia* of Stål (*Umbonia* of Fair-

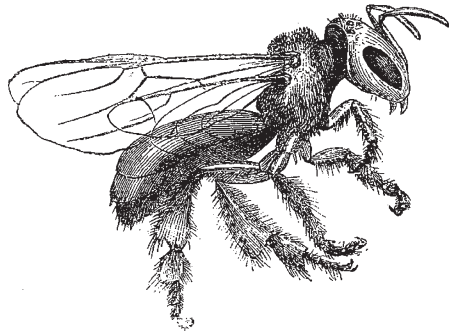


FIG. 1.—Cacafogo, worker (side view).

maire), the species most probably being *indicator* Fairm. As to the *Trigona* species referred to in the above letter, I have in the meantime received numerous good specimens, not only a number of workers, but also some males, and even one queen. Mr. Frederick Smith has been good enough to compare my specimens with the collection in the British Museum, and has found that they belong to an undescribed species. Having worked through the literature on *Trigona* and *Melipona* as completely as possible, and after perusing the descriptions of about one hundred species, not having found a single one of which all three kinds of individuals are known, I think it will

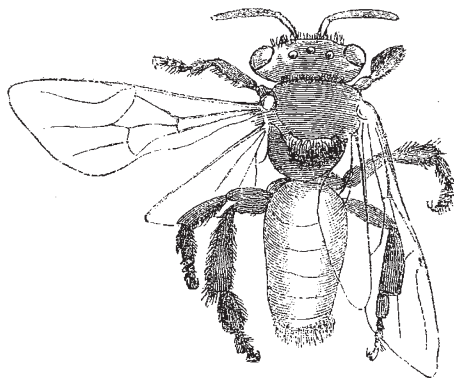


FIG. 2.—Cacafogo, male.

be welcome to the readers of this journal who are interested in entomology, if I do not restrict myself to merely mentioning the name and diagnostics of my new *Trigona* species, but give a description of its workers, male and queen, adding a brief account of its peculiar habits and economy from my brother's (Fritz Müller) observations.

*Trigona cacafogo*\*

Length of the workers and males 5—5½, of the queen 6—7 mm. Males and workers are almost alike in size, colour, and outline of the body, and are distinguished from

\* I call the species *Cacafogo*, using the vernacular name for the specific one.

most other species of the same genus by the breadth of their head and the narrowness of their abdomen, which, in the workers, scarcely exceeds half the breadth of the head. In the males the abdomen is equally slender, but the head somewhat less broad; in the queen the head is of the same size and form as in the workers, but the abdomen is so much dilated as to reach one and a half times the breadth of the head.

The head, tegulæ, scutellum, and abdomen, in all three kinds of individuals, are ferruginous, smooth and shining, the posterior margins of the vertex, of the scutellum and of the last segments of the abdomen have a

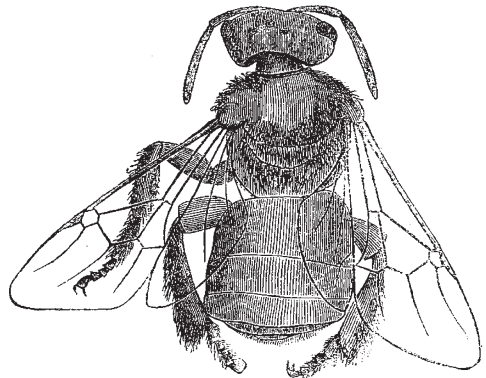


FIG. 3.—Cacafogo, queen.

black pubescence; the rest of the thorax, together with the legs, is black with black pubescence; the antennæ black, the greatest part (♀) or the whole (♂) of the scape rufo-piceous, the flagellum fuscous beneath. The wings by far exceed the abdomen; the basal portion and radical cell of the anterior wings dark fuscous; their apical portion and the posterior wings subhyaline; the stronger nervures brown, the feeblest ones pale ferruginous; no cubital cell at all. The mandibles with two teeth at their apex. The tibiæ triangular, their outside pubescent from the base to the middle, towards the apex slightly ex-

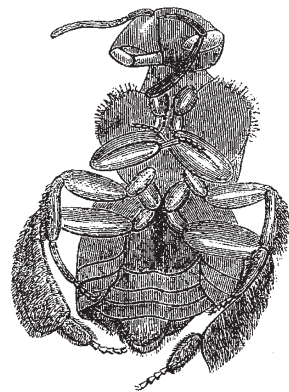


FIG. 4.—Cacafogo, queen (from beneath).

convex, smooth, shining, and naked. The whole body destitute of feather-like hairs. The unguiculæ of the males are, in this as in other *Trigona* and *Melipona* species, two-cleft; whilst those of the workers and females are simple. The queen, besides her larger size and the much dilated abdomen, differs from the workers by the colour of the head being somewhat paler, the antennæ longer, the thorax stronger, its anterior and lateral margins and two longitudinal streaks rufo-fuscous, the anterior wings provided with a completely closed cubital cell, the legs larger and more robust, especially the anterior and middle tibiæ much thicker, the outside of the posterior tibiæ slightly convex and pubescent nearly

as far as the apex, the apex of the posterior tibiæ bordered with partly feather-like hairs.\*

The nests of *T. cagafogo*, like those of many other species, are built in hollow trees. One of two nests which my brother had the opportunity of observing was found in a tree cut down a long time before; but its combs, lying in confusion, probably in consequence of the direction of the trunk having been altered by felling the tree, showed that the nest had probably been built before the tree was felled. In this nest, the inhabitants of which partly perished by having been plastered over with the honey which flowed from the damaged honey-pots during the transport, partly, as is to be supposed, flew away afterwards; besides a great number of workers and a small number of males, only a single queen was found, viz. that illustrated in Figs. 3 and 4. The honey-pots, of the size of large hazel-nuts, were closely aggregated together. The honey was of a very viscous consistence, partly as clear as water, partly lighter or darker yellow; its flavour appeared to my brother insipid, pituitous, and somewhat disagreeable (the latter perhaps, as he supposes himself, because he was conscious of the cagafogos feeding upon carrion). The brood-combs, as with other Trigonas, were simple layers of hexagonal upright cells. The wax, of which both the honey-pots and the brood-combs were built, was nearly of a pure white colour, but it was mixed with such an enormous quantity of heterogeneous ingredients (perhaps 90 per cent.) that the building appeared of a dirty brown or blackish colour.

Another nest, found by my brother in a trunk of *Canella pimentata*, about five meters above the ground, was brought safely home after cutting down the tree; but a week afterwards all the inhabitants had flown away.

The most striking feature in the natural history of this stingless bee is its fondness for oily matters, and its singular means of defence, connected with a great irritability. As I have already stated (vol. viii. p. 201) it feeds upon carrion; and is also fond of old stinking cheese. When visiting flowers, it seems to be also guided by its particular taste; it visits in swarms the flowers of a bean with glandular calyx; also a white-flowered Abutilon and *Sicyos angulata*, the flowers of which are glandular and secrete an oil. It was also observed fertilising the flowers of *Asclepias curassavica*, milking the larvae of *Membracis*, repeatedly sucking the juice flowing out of trees, and devouring the sugar spread to be dried. Its singular means of defence are indicated by the vernacular name Cagafogo (spit-fire), for although stingless, like all other Trigonas and Meliponas, it possesses a very intense venom, which causes a most lively irritation in the skin. Whilst the defenceless species are for the most part very peaceable, the Cagafogos, on the contrary, are so irritable that the observation of their nests proves impossible, unless cold weather or strong breezes from the land keep them quiet.

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#### THE MAMMALS OF MOUPIN

"WHERE is Moupin?" our readers will say, when they see the heading of this article. To this it may be replied that, if not already well known to zoologists, Moupin bids fair to become so very quickly, as it possesses one of the most strange and interesting faunas which have become known to us of late years. Moupin is the name of one of the small independent principalities lying on the extreme west of the great Chinese province of Setchuan. It does not appear to be marked on any of our charts, but if our readers will turn to the map of China and find Ching-tou, the capital of Setchuan, they will see still farther to the west a range of mountains de-

signed the "Yungling Mountains," which separate China proper from Tibet. Amongst these the district called Moupin is situated.

The first and only European who has penetrated to this remote corner of the earth is the celebrated French traveller, Armand David, a missionary priest of the congregation of Lazarists, who has for many years, by permission of his superiors, devoted himself to the exploration of the Chinese flora and fauna. Père David left his mission in Peking in May 1868, and travelled by the Yangze-kiang—the great high road into the interior of China—to Chong-kin. Hence he proceeded by land, leaving his baggage to follow by water, and after twelve days' journey reached Chong-tong, the capital of the great province of Setchuan, where there is a large Catholic mission, presided over by an Apostolic vicar. Hence to Moupin was eight days' journey farther westward, during the latter portion of which a mountain range nearly 10,000 ft. high was traversed. Père David's ordinary residence in Moupin was in one of the high valleys at an elevation of about 7,000 ft. above the sea-level, above which rose one of the principal mountains of the district to the height of 15,000 ft. Up to about 10,000 ft. dense woods of pines and cedars varied with rhododendrons, laurels, and magnolias prevail. During a ten months' residence in this locality, Père David formed extensive collections in every branch of Natural History, which were transmitted to the museum of the Jardin des Plantes at Paris. In a report\* addressed to the professors of that establishment, which has been lately published in the 7th volume of the "Nouvelles Archives," Père David has given a complete list of the mammals of his collection, which embraces no less than 110 species. The novelties are shortly described by M. Alphonse Milne-Edwards, one of the naturalists of the Jardin des Plantes, who, however, is now giving a much more complete account of them in a large work on which he is engaged, entitled "Récherches sur l'histoire naturelle des mammifères." The following are some of Père David's most remarkable discoveries in Moupin in the class of Mammals.

Under the name *Rhinopithecus roxellana* is described a very singular new form of monkey, clothed with dense hair, and with a turned-up nose, which inhabits the highest forests adjoining the snow. A second monkey from the same mountains is described as *Macacus thibetanus*; and a third was ascertained to exist in the rocks of the more eastern part of the district, but was, unfortunately, not obtained.

Amongst the Insectivora, Père David's discoveries are also remarkable. Besides several species of shrew, of the known genera *Sorex* and *Crocidura*, a new form, allied to *Diplomesodon*, was discovered, which M. Milne-Edwards names *Anourosorex squamipes*. Still more curious is an entirely new aquatic form, allied to *Mygale*, which M. Milne-Edwards names *Nectogale elegans*. The moles are also represented in Moupin by two entirely new genera, *Uropsilus* and *Scaptonyx*, besides a new species of true *Talpa*.

The rodents of Moupin embrace several new species of *Mus*, *Rhizomys*, *Siphneus*, and *Lagomys*, besides squirrels of different genera: examples of thirty-six species in all were obtained. The carnivores also furnished some important novelties, three new polecats (*Putorius*), two new species of the badger-like form *Arctonyx*, and a new cat (*Felis*). But in this group the most industrious discovery was that of the *Elurus fulgens*—hitherto regarded as a type peculiar for the higher Himalayas, and of its allied but larger brother *Elurops melanolenus*—one of the most wonderful of recent additions to the class of mammals. These two genera constitute a special family of carnivores, representing, in the Palæarctic region, the

\* A more full and detailed description of this and some other new species will be given in a separate treatise on Trigona and Melipona, to be published by my brother and myself.

\* Rapport adressé à MM. les Professeurs-Administrateurs du Muséum d'Histoire naturelle par M. l'Abbé Armand David. Nouv. Arch. d. Mus. vii. Bull. p. 75.