

THE STINGLESS BEES (MELIPONIDAE) OF MEXICO

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Because the Old World honeybee, *Apis mellifera*, is so much a part today of the apifauna of the Western Hemisphere, it is difficult to think of it as an alien that only a few centuries ago was confined to the eastern half of our globe. Like European man, whom it accompanied to the New World, it has spread through the Americas, supplying wax and honey and performing useful services of pollination.

In paying tribute to the honeybee for the aid it has rendered to man and to his civilization, it is well, however, not to forget that, long before the introduction into our hemisphere of this cooperative insect, there were other social bees, belonging to the family Meliponidae, that throughout the tropical areas, at least, kept the aboriginal inhabitants supplied with tasty honey and useful wax. In an era before the planting of sugar cane in the New World these bees, which added to their other virtues that of being stingless, must have been man's principal reliance whenever he craved a substitute for sugar.

Stingless bees and their products have long been associated with man in Mexico. Gómara¹ called attention to the fact that in the great market place in Mexico City honey was an article of commerce when Cortés and his adventurous followers entered the capital of the Aztecs, and the honey was of "sundry kinds," from which perhaps one may infer that the product of several species of stingless

¹ F. L. de Gómara, 1578. The Pleasant Historie of the Conquest of the West India, now called New Spayne, p. 200.

bees was offered for sale. Wax, too, was traded in the great market at Temixtitlan on the authority of no less a person than Cortés himself, and to leave no doubt as to the origin of the commodity Cortés alluded to it as "wax from bees."² To indicate that honey was appreciated in high places as well as by the lowly, mention may be made of the fact that the Aztec emperor from his lofty seat of power placed the conquered peoples of the "tierra caliente" under obligations to deliver an annual tribute of honey. From a region located largely in what is today the State of Guerrero no less than 2400 jars of honey were delivered each year.³ As these records date from a period before the Old World honeybee established itself, with the aid of man, in the Americas, it is plain that the producers of the honey and of the wax were in all probability stingless bees.

Mention was made of the State of Guerrero as a source of bee products, but the state that was seemingly preeminent in the past and that still gives convincing evidence of stingless bee culture is Yucatán. It was this state that in the sixteenth century furnished wax to Tabasco and to Honduras for the making of candles because the supply was inadequate in these near-by areas.⁴ Among the seventeenth century records of stingless bee culture in Tabasco is that of Captain William Dampier.⁵ Relating the experiences of his visit to that region in 1676, he mentioned as an occupation of the Indians the "search in the Woods for Bees that build in hollow Trees" and he added that they "get a good livelihood by the Honey and Wax." But Dampier goes on to say that in addition to this pillaging of wild hives the indigenes also "keep of them tame, and cut hollow Trunks for them to make their Combs in." At the beginning of the nineteenth century, von Humboldt during his visit to Campeche indicated that an apiary of native bees in that area might consist of as many as 600 or 700 hives.⁶ In contrast, an apiary made up of about 50 hives, as reported by Bequaert in Yucatán⁷ or one of 110 hives, which I had occasion to observe in the same state, seem small. However, Norman⁸ recorded an apiary in Yucatán in which

² H. Cortés, 1843, *The Despatches of Hernando Cortés, the Conqueror of Mexico*, addressed to the Emperor Charles V, p. 113.

³ P. R. Hendrichs, 1941, *México Antiguo*, Vol. V, p. 367.

⁴ R. L. Roys, 1943, *Carnegie Inst. Washington Publ.*, N° 548, pp. 53-54.

⁵ W. Dampier, 1906, *Dampier's Voyages*, Vol. 2, p. 208.

⁶ F. H. A. von Humboldt and A. J. A. Bonpland, 1811, *Voyage aux Régions Equinoxiales du Nouveau Continent fait en 1799-1804*, Pt. 3, Vol. 3, p. 240.

⁷ J. Bequaert, 1932, *Bull. Brooklyn Ent. Soc.*, New Series, Vol. 27, p. 17.

⁸ C. Norman, 1894, *Gleanings in Bee Culture*, Vol. 22, p. 511.

more than 400 hives of domesticated stingless bees were assembled and, although his observation was made about fifty years ago, one likes to think that this larger figure may perhaps be characteristic also of some unheralded apiary of the present.



An apiary of stingless bees between Mérida and Chichén Itzá (Fot. D. M. Schwarz)

The stingless bee especially favored for domestication in Mexico is *Melipona beecheii*. The fact that there are numerous popular names for this bee in addition to the several scientific names that have been independently applied to it is indicative of the wide-spread interest it has aroused. Among the Maya of east central Quintana Roo, it is known as "colel-cab," meaning lady bee, as well as "xunan-cab." There is even a hybrid name for it, half Mayan and half Spanish, namely "colmena-cab," emphasizing the fact that it is **the** hive-bee preeminently.⁹ It is said that the Lacandones designate it "abeja alazana," or sorrel-colored bee, as well as "mimialcuatl."¹⁰ It is stated also that "pipioli" is a name used for *beecheii* but, as "pipioli" means "very small fly," it is possible that this term has been included in error.

While *Melipona beecheii* receives precedence in the apiculture of the Yucatan peninsula, there are other species as well that have been transferred from the forest and made accessible for honey-

⁹ A. Villa, R., 1945, Carnegie Inst. Washington Publ., N° 559, p. 58.

¹⁰ K. T. Sapper, 1935, Ibero-Amer. Arch., Vol. 9, p. 190.

gathering. Five honey-producing Hymenoptera besides **Melipona becheii** are recorded by Redfield and Villa R. as being favored by the Maya villagers of Chan Kom.¹¹ Four of these — "xik", "ehol", "yaxich", and "niit-cab" — are seemingly stingless bees. It is possible that "xik" is **Trigona (Tetragona) nigra**; at any rate, the brief description of the wings with their white spot accords with the condition in that species. Another name for "niit-cab" is "limon-cab." A limelike or lemonlike smell is characteristic of **Lestrimelitta limão** and one is tempted to associate "niit-cab" with this bee in consequence, especially as the honey of "niit-cab" allegedly "isn't good honey" while that of **Lestrimelitta** is frequently poisonous. However, specimens of **Lestrimelitta limão** that I have seen from Yucatan were designated "xnuc," meaning "old wife," while the term "limon-cab" was applied to specimens of **Trigona (Nannotrigona) testaceicornis perilampoides**. The association of popular names with the corresponding scientific names has not yet reached a stage of complete dependableness, but the very fact that different species have popular names is in itself a matter of interest.

Other stingless bees cultivated by the natives of Yucatan include **Trigona (Tetragona) jayy**, a member of the subgenus **Partamona**,¹² and **Trigona (Scaptotrigona) pectoralis**.¹³ Some years ago I had opportunity to identify as **Melipona fasciata guerreroensis** a colony of domesticated stingless bees that Usinger observed in the district of Temascaltepec.¹⁴ If a thorough search were made throughout Mexico, it is likely that several other species would be numbered in the total of those that have been brought under the continuing control of man.

In addition to organized apiculture there is, however, also removal of honey and wax from wild nests. Sometimes such foraging becomes the activity not of a single individual but takes on the character of a communal effort. In the Río Balsas valley of the State of Guerrero, for instance, bands consisting of as many as ten individuals will set forth in the dry season equipped with honey-gathering tools to scour the mountains in search of bee trees. When they have been fortunate enough to locate such a tree, they chop it down and fill their bottles with the available honey.¹⁵

11 Chan Kom, a Maya Village, Carnegie Inst. Washington Publ., No. 448, pp. 49-50.

12 W. Stempell, 1908, Zeitschr. Ethnol., Vol. 40, pp. 736-737.

13 I. Bequaert, 1932, Bull. Brooklyn Ent. Soc., New Series, Vol. 27, p. 17.

14 R. L. Usinger, 1935, Gleanings in Bee Culture, Vol. 63, p. 667.

15 P. R. Hendrichs, 1941, México Antiguo, Vol. 5, pp. 366-367.

It seems appropriate at this point to quote a hitherto unpublished field note which Dr. T. C. Schneirla has kindly placed at my disposal. The observation was made around 10.30 a.m. on March 9, 1945 while Dr. Schneirla was traversing the Lacandone forest of eastern Chiapas and reads as follows:

"Going northeast along the Santa Cruz River about eight miles from Jetja I heard the sound of an axe on wood. I came to a huge buttressed tree against which Lacandones (two men, one woman with a child about eight years old) had built a framework. This was a scaffolding of stakes, with fibre-attached cross-pieces, which brought the narrow upper platform to a height of about eleven feet from the ground (notes say 3 to 4 meters).

"No photo tried; light too dim for regular picture and no time for flash.

"From the notches which had been cut into the knife-edges of two adjacent buttresses (about two and a half meters apart) stingless bees could be seen issuing, as well as some **Camponctus** ants. The man on the scaffolding continued cutting at one of the buttresses as I watched. Nothing but Lacandone was spoken when I tried them with some Spanish. However, I considered it quite probable that the people were after honey, not only because of the coincidence of cutting and bees, but also because lying on the ground near where the woman was standing there was one of their medium-sized pottery vessels, empty at the time."

A far more hazardous method of collecting wild honey is that observed by Beals¹⁶ in the neighborhood of Charan, a Tarascan village in the State of Michoacán. There the honey-gatherer cuts notches in the trunk of a bee tree, supporting himself by a rope as he chops. "The rope is not tied, but passes around the tree trunk and the two ends are held in the hands." By this technique the venturesome climber makes his way upward, dexterously flipping the loop of rope higher up the tree trunk as he advances. What adds to the hazard is that, unlike the cooperative efforts previously referred to, each of these Tarascan honey-gatherers operates unassisted and alone.

The Meliponidae, which extend to southern Brazil, the Misiones region of Argentina as well as Paraguay and Uruguay, have their northern limit in Mexico. In the southern part of Mexico they are well represented. How far north they extend in that country it is difficult

¹⁶ R. L. Beals, 1946, Inst. Sec. Anthropol., Smithsonian Inst. Publ., N° 2, pp. 13-14.

to say with certainty as collecting of specimens has been far more persistent in the south than in the north. It would seem probable that in favorable localities these bees are found farther north along the extensive west coast of Mexico than along its shorter east coast. I have seen specimens of **Trigona (Nannotrigona) testaceicornis perilampoides** from a place designated on the label Lodi Verdugo in the State of Sinaloa. Probably this is a misspelling of Lo de Verdugo, which lies west of Culiacán, about midway up the state. It is possible that search of some of the barrancas of tropical vegetation in the southern part of the State of Sonora would reveal colonies of stingless bees, but this surmise needs confirmation. Even Lo de Verdugo is considerably farther north than the northernmost locality at present known for stingless bees on the eastern side of the country, namely, Tamazunchale, in the State of San Luis Potosí. Whatever may be their northern limit in Mexico, stingless bees have failed to penetrate the United States on their own initiative. Even the Brownsville region of Texas, which harbors many insects closely related to those of Mexico, lacks representation of stingless bees. Attempts, initiated by Paulo Nogueira Neto of São Paulo, Brazil, in 1948, and carried on with the cooperation of Dr. Warren Whitcomb, Jr., to establish colonies in Baton Rouge, Louisiana, started well. Although some of the colonies subsequently succumbed, one—a colony of **Trigona jaty**—was reported in a letter to me dated May 24 as being "in fine condition," having apparently survived the winter. But this is a man-induced, not a natural invasion of new territory.

Although limits of space make it impossible to list the specific localities where the various stingless bees known to occur in Mexico have been collected, it may be of some help in visualizing the distribution to set down the states, at least, where specimens have been taken, and such a summary follows:

Melipona becheii Bennett: Jalisco, Oaxaca, Veracruz, Tabasco, Campeche, Yucatán.

Melipona fasciata Latreille: Veracruz.

Melipona fasciata belizeae Schwarz: Tabasco.

Melipona fasciata guerreroensis Schwarz: Mexico, Guerrero, Oaxaca, Veracruz. (Thus far this form has been collected only in Mexico.)

Lestrimelitta limão F. Smith: Yucatán.

Trigona (Trigona) amalthea (Olivier): Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán.

Trigona (Trigona) trinidadensis silvestriana Vachal: Data as to state and locality in Mexico not given.

Trigona (Trigona) corvina Cockerell: Distrito Federal, Oaxaca, Veracruz, Tabasco, Campeche.

Trigona (Trigona) nigerrima Cresson: Guerrero, Oaxaca, Veracruz.

Trigona (Trigona) fulviventris Guérin: Jalisco, Colima, Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán.

Trigona (Tetragona) jaty F. Smith: Chiapas.

Trigona (Tetragona) nigra Cresson: Jalisco, Michoacán, Guerrero, Oaxaca, Yucatán. (Typical **nigra**, so far as my observations go, has been collected only in Mexico and may be confined to that country.)

Trigona (Gectrigona) acapulconis Strand: Guerrero, Oaxaca, Mexico. (This species is represented by specimens from Mexico only, and it may be that it is confined to that country.)

Trigona (Partamona) testacea variety: Oaxaca, Chiapas, Veracruz.

Trigona (Partamona) testacea orizabaensis Strand (probably = **bilineata** Say): San Luis Potosí, Morelos, México, Colima, Michoacán, Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Yucatán.

Trigona (Plebeia) mosquito jatiformis Cockerell: Oaxaca, Chiapas, Veracruz.

Trigona (Plebeia) mosquito frontalis Friese: Jalisco, Guerrero, Chiapas, Yucatán, Veracruz.

Trigona (Scaura) latitarsis Friese: Oaxaca, Tabasco, Veracruz.

Trigona (Oxytrigona) tataira mediorufa Cockerell: Chiapas.

Trigona (Cephalotrigona) capitata F. Smith: Locality in Mexico not indicated.

Trigona (Cephalotrigona) capitata eburneiventer Schwarz: Mexico, Morelos, Guerrero. (Thus far **eburneiventer** has been collected only in Mexico and it may be confined to that country.)

Trigona (Cephalotrigona) capitata zexmeniae Cockerell: Veracruz, Yucatán.

Trigona (Hypotrigona) buyssoni Friese: Chiapas.

Trigona (Nannotrigona) testaceicornis perilampoides Cresson: Sinaloa, Michoacán, Guerrero, Oaxaca, Chiapas, Veracruz, Tabasco, Campeche, Yucatán.

Trigona (Scaptotrigona) pectoralis (Dalla Torre): Chiapas, Veracruz, Tabasco, Yucatán.

Trigona (Scaptotrigona) hellwegeri Friese: Jalisco, Colima, Michoacán, México, Morelos. (Thus far all the specimens of **hellwegeri** that have come to my attention have been from Mexico and it may well be that **hellwegeri** is confined to that country.)

Trigona (Scaptotrigona) mexicana Guérin: Guerrero, Oaxaca, Chiapas, San Luis Potosí, Veracruz.

It will be noted that of the 22 different forms of stingless bees known to occur in Mexico four—**Melipona fasciata guerreroensis**, **Trigona acapulconis**, **T. nigra**, and **T. hellwegeri**—may be confined to that country. At the other extreme are species like **Lestrimelitta limão**, **Trigona amalthea**, **T. fulviventris**, **T. latitarsis**, **T. capitata**, and **T. jaty** that have a range extending from Mexico to southern Brazil. The range of the other forms is intermediate but most of them, while represented in the Central American countries, either do not extend into South America or reach that continent only here or there.

With the hope that it may be of service in identifying the known Mexican stingless bees the following key for Workers—the caste usually collected—is offered:

KEY TO THE MEXICAN STINGLESS BEES WORKERS

1. No comb anteriorly at the apex of the posterior tibiae; the outer face of these tibiae of rather uniform level, with the apical extremity not depressed. The labrum with two strong tubercles. Chitin smooth, hairs sparse.....**Lestrimelitta limão** F. Smith.
A comb anteriorly at the apex of the hind tibiae; the outer face of these tibiae either more flattened at the apex than towards the base, or more or less depressed or excavated at the apex, or in some forms hollowed from the apex almost to the base 2
2. Wings relatively short, usually terminating near the apex of the abdomen or only a little beyond. The stigma poorly developed, almost linear, with the apical half of its underside faintly concave to straight, tapering to a point. The number of hamuli per lower wing in the known Mexican forms ranging from 9 to 13. Robust..... 3
Wings long, extending emphatically beyond the apex of the abdomen. Stigma more fully developed, rounded below. The hamuli per lower wing very exceptionally more than 8, usually between 5 and 8..... 6

3. The apex of the mandible with two distinct denticles toward its upper extremity. The antero-lateral angles of the mesonotum with a rust-red patch of hair that contrasts rather sharply with the other thoracic hairs. Tergites 1-5 each with a narrow, uninterrupted, yellow band.....
 **Melipona beecheii** Bennett.
 The apex of the mandible not thus armed, barely irregular in contour and usually described as edentate. No rust-red patches of hair in the antero-lateral angles of the mesonotum.... 4
4. Tergites 2-6 blackish, with usually feebly developed yellowish to obscurely brownish bands traceable along the apex of each **Melipona fasciata** Latreille.
 The tergites predominantly or wholly reddish to castaneous.. 5
5. The hairs of the vertex predominantly or wholly black.....
 **Melipona fasciata guerreroensis** Schwarz.
 The hairs of the vertex predominantly fulvous.....
 **Melipona fasciata belizeae** Schwarz.
6. The stigma rather large for the size of the bee (about as long as the scape) and almost hyaline except for the darker periphery. The marginall cell widely open, the marginal vein being vestigial to absent over the apical one-fourth to one-third of the distance needed completely to close the cell. The low point of the downward bend of the marginal vein distant from the costal margin of the wing barely more than twice the greatest width of the stigma. The head and thorax finely and densely sculptured over most of their surface, immaculate, and without erect hairs except for a few on the vertex and scutellum. Microscopic bee, about 2.5 mm. in length, with a forewing of the same length if the tegula be included in the measurement.....
 **Trigona (Hipctrigona) buyssoni** Friese.
 Not having this combination of characters..... 7
7. The head (lower part of face in **Oxytrigona** excepted) and thorax completely smooth and polished or with sculpturing so feeble and sparse that the shininess of the surface is usually dulled, if at all, only by the presence of hairs..... 8
 At least the thorax and usually also the head with clearly defined sculpturing: punctate, granular, rugosely pitted, tessellate, or a combination of these..... 22

8. The fringe along the posterior lateral contour of the hind tibiae with plumose hairs in addition to usually sparser simple hairs 9
 The fringe along the posterior lateral contour of the hind tibiae consisting of simple hairs only..... 17
9. The apex of the mandible with four or five teeth extending along its edge from end to end; these teeth usually clearly demarked although sometimes connected by thin intervening septa of chitin. The face and mesonotum immaculate. A more or less oval area at the base of the inner face of the hind metatarsus that is covered with appressed sericeous hairs, in contrast to the apical one-half to two-thirds of the inner face of the joint that is covered with semi-erect bristles and is brush-like in appearance. The hairs of the abdomen black or predominantly black both dorsally and ventrally..... 10
 The apical edge of the mandible edentate on its lower two-thirds, the upper and sometimes partly concealed one-third with two denticles. The face and mesonotum sometimes maculated. The oval area of appressed hairs on the inner face of the hind metatarsi of rare occurrence..... 14
10. The apical edge of the mandible with four teeth, the uppermost (often concealed) less distinct than the three lower ones. The labrum feebly bituberculate. The wings usually of a rather uniform, slightly yellowish stain. The abdomen fulvous to reddish..... **Trigona (Trigona) fulviventris** Guérin. 11
 The apical edge of the mandible with five teeth, the two uppermost sometimes very small. The labrum simple. The abdomen in mature specimens black..... 11
11. The hind tibiae very wide at the apex and rather pronouncedly truncate to subtruncate along their apical margin. The scutellum semicircular along its posterior contour. The erect black hairs on the apical half of the clypeus much longer than those on the scape. The wings rather strongly smoky. The length of the forewing including the tegula, 8 to 8.5 mm. **Trigona (Trigona) nigerrima** Cresson. 12
 The apex of the hind tibiae somewhat emarginate, with at least a slight angulation where the posterior contour and the apical contour meet..... 12
12. Fairly large, usually 7 to 8.5 mm. in length, with a conspicuously long forewing, 9 to 9.5 mm. including the tegula.

- No erect black hairs on the clypeus, only microscopic silvery gray appressed hairs. Over the front an exceedingly low, dense, even growth of erect, microscopic, black hairs, so short that they are readily traceable only when the bee is viewed in profile.....
-**Trigona (Trigona) trinidadensis silvestriana** Vachal.
Smaller, 4.75 to 6 mm. in length, with a forewing 6 to 7.25 mm. in length including the tegula..... 13
13. The clypeus on virtually the same level as the sides of the face and distinctly flat. Scape without black bristles. Mandibles black but almost invariably banded narrowly with red just before the apex. Length of forewing including tegula, 6 to 6.25 mm.....**Trigona (Trigona) amalthea** (Olivier).
The clypeus gently arched, with usually a very shallow median longitudinal fossa (sometimes only faintly traceable). Black bristles present on the scape. The mandibles reddish to brownish over most of their surface.....
-**Trigona (Trigona) corvina** Cockerell.
14. The abdomen of nearly the same width as the thorax. Black, immaculate, with the face rather conspicuously covered with glistening silvery gray plumose hairs. Abundant silvery gray hairs on the abdomen above apically and over the entire ventral surface.....**Trigona (Geotrigona) acapulconis** Strand.
The abdomen distinctly narrower than the thorax..... 15
15. The forewings smoky except for their milkwhite apical tips. Sidefacial maculations subdued to absent. Thorax immaculate. Head, thorax, legs, and abdomen black.....
-**Trigona (Tetragona) nigra** Cresson.
The forewings transparent with orange-colored venation and stigma. Both the lower half of face and the thorax richly and strongly maculated with yellow. The legs predominantly yellow..... 16
16. The side-facial maculations not completely filling the space between the clypeus and the inner orbit of the eye. A more or less oval area of appressed sericeous hairs at the base of the inner face of the hind metatarsus. Abdomen usually prevailing honey-colored. Small bee, 3.75 to 4 mm.....
-**Trigona (Tetragona) jaty** F. Smith.
The side-facial maculations completely filling the space between the clypeus and the inner orbit of the eye, ending

- about level with the upper boundary of the clypeus. No differentiated area at the base of the inner face of the hind metatarsus, this area being covered with bristles like the rest of the inner face of the joint. Tergites 2-5 dark basally, broadly banded with yellow apically.....
**Trigona (Tetragona) clavipes perangulata** Cockerell.
17. The mandibles edentate. The hind metatarsi somewhat wider than the rather triangular hind tibiae and notably swollen....
**Trigona (Scaura) latitarsis** Friese.
 The mandibles with two denticles along the upper one-third of their apical edge. The hind metatarsi narrower than the associated tibiae 18
18. The clypeus small and remote from the rather diminutive compound eyes, densely if finely tessellate to punctate as are usually also the adjacent regions of the sides of the face. The malar space long, nearly twice as long as the flagellum is wide. The mesonotum with the middle one-third orange ferruginous, the lateral thirds black but bordered outwardly by a stripe of orange ferruginous.....
**Trigona (Oxytrigona) tataira medicorufa** Cockerell.
 Not having this combination of characters..... 19
19. The hind tibiae greatly expanded, about one half as wide as long, their exterior face deeply hollowed from the apex almost to the base, a little suggesting the bowl of a spoon, the anterior lateral contour being almost as convex as the posterior lateral contour 20
 The hind tibiae subtriangular to slightly clavate in contour, the anterior contour straight, barely concave toward the base, the posterior contour strongly convex, the outer face of the joint without a spoonlike hollow..... 21
20. The hairs on the underside of the abdomen (except those on the last visible sternite) silvery-gray.....
**Trigona (Partamona) testacea crizabaensis** Strand
 The hairs on the underside of the abdomen black.....
**Trigona (Partamona) testacea** variety.
21. The abdomen bright ferruginous, with sometimes a dark, transverse band at the apex of tergite 1, superimposed on a similar band at the base of tergite 2, and more rarely a band also at the apex of tergite 2. Legs predominantly ferruginous
**Trigona (Plebeia) mosquito jatiformis** Cockerell.

- The abdomen predominantly black.....
-**Trigona (Plebeia) mosquito frontalis** Friese ¹⁷
22. A large prominent tooth at the upper (inner) extremity of the otherwise edentate apex of the mandible. The clypeus, lower part of supraclypeus, and lower extremity of sides of face coarsely punctured but shiny in contrast to the densely granular and dull upper half of the head. No V-shaped incision at the middle of the basal boundary of the scutellum..... 23
- The apical edge of the mandible with two denticles at the upper (inner) extremity. Sculpturing of the head different. A small, more or less shiny V-shaped incision at the middle of the basal boundary of the scutellum..... 25
23. The abdomen dull reddish fulvous, the tergites more or less darkened narrowly along the apex.....
-**Trigona (Cephalotrigona) capitata zexmeniae** Cockerell.
- At least the first five tergites of the abdomen completely or almost completely black or brownish black..... 24
24. Tergite 6 and most or all of the underside of the abdomen ivory-colored. The thorax wholly black.....
-**Trigona (Cephalotrigona) capitata eburneiventer** Schwarz.
- Tergite 6 dark at least basally and often wholly so; the venter likewise blackish or dark brownish. The thorax more or less maculated with yellow on at least the mesonotum.....
-**Trigona (Cephalotrigona) capitata** F. Smith.
25. The scutellum with a more or less V-shaped emargination at the middle of its backward-projecting apical border. The mesonotum and mesopleura with rugose, deeply pitted punctation
- Trigona (Nannotrigona) testaceicornis perilampoides** Cresson.
- The apical contour of the scutellum rounded and entire, not projecting backward sufficiently to conceal the propodeum. The sculpturing of the thorax dense but rather fine, tessellate to minutely punctate. The wings approximately transparent, with bright orange venation and stigma..... 26

¹⁷ There is considerable diversity of size among the specimens here assigned to *frontalis*, the smallest specimens measuring only about 3 mm. compared with about 5 mm. in the case of the largest. The length of the forewing, including the tegula, of the smallest specimens is barely more than 3 mm., as compared with 5 mm. for the largest. Specimens of intermediate size tend to bridge the gap, presenting a situation somewhat like that found in *Trigona (Trigona) trinidadensis* (Provancher) except that the size relationship is more extreme. The facial maculations like the thoracic differ somewhat from specimen to specimen in intensity but the essential pattern is traceable in all.

26. Legs and mesopleura black to sometimes very deep brown
 **Trigona (Scaptotrigona) mexicana** Guérin.
 Legs wholly or predominantly tawny. The mesopleura for the
 most part tawny but usually maculated to some extent with
 black 27
27. The mesonotum black; the scutellum tawny.....
 **Trigona (Scaptotrigona) pectoralis** (Dalla Torre).
 The mesonotum almost completely red, flanked usually by
 a dark stripe near each lateral border and as a rule traversed
 also medianly by two hair-fine dark longitudinal stripes that
 are basally parallel and apically diverging. The scutellum
 black..... **Trigona (Scaptotrigona) hellwegeri** Friese.

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In conclusion I should like to express my deep appreciation of the honor accorded me by Dr. Roberto Llamas in asking me to contribute to this special issue commemorating the twentieth anniversary of the Instituto de Biología. It is a pleasure to register one's admiration for the splendid accomplishments of the Instituto during the first two decades of its existence and to wish it long life and new triumphs in the years ahead.

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