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Sibling Species of *Trigona* from Angola (Hymenoptera, Apinae)¹

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Recently a considerable amount of biological work has been published concerning small West African bees of the subgenus *Hypotrigona*, at first identified as *Trigona gribodoi* Magretti, and later, thanks to Guiglia's (1955) clarification of the characters of that species, as *T. braunsi* Kohl. Every recent paper concerning the biology of these bees has referred to two forms. These forms are clearly distinguished by the natives of Angola, who have different names for them in their languages. Because Portugal-Araújo and Kerr (in press) have shown them to be sympatric and reproductively isolated, these forms must represent distinct species. The taxonomic necessities are provided here in order that those authors can satisfactorily present their data on reproductive isolation and allied matters.

The two species herein segregated differ from other African *Hypotrigona* by the dull, finely and very closely punctate mesoscutum and scutellum, the latter but little more shining and more finely punctate than the former. In other species the scutellum is distinctly more shining than the mesoscutum.

The separation of these species (*braunsi*, *sensu lato*) from *gribodoi* Magretti was indicated by Kohl (1894) but was not properly documented until Guiglia (1955) compared type material of *braunsi* and *gribodoi*, tabulated the differences, and gave photographs of the posterior legs. Meanwhile, the differences between them were often re-

¹ Contribution Number 1024 from the Department of Entomology of the University of Kansas, Lawrence, Kansas.

garded as inconsequential and not of specific value (Cockerell, 1934; Schwarz, 1948). It now becomes apparent that one of the species (*braunsi*) so recently differentiated by Guiglia is itself composite, as shown below.

The following characters are important features of workers of both *braunsi* and its sibling, described below as *araujoi*: scutellum opaque, punctation not much different from that of mesoscutum; posterior margin of hind tibia more strongly rounded apically than elsewhere, not angulate apically; metatarsus broader at or beyond middle than basally.

Trigona (Hypotrigona) braunsi Kohl

Trigona braunsi KOHL, 1894, p. 280. FRIESE, 1909, p. 456. GUIGLIA, 1955, p. 310.

Trigona gribodoi form *cassusso* PORTUGAL-ARAÚJO, 1955a, p. 108; 1955b, p. 25; 1956, p. 10.

Trigona braunsi form *cassusso* PORTUGAL-ARAÚJO, 1958, pp. 203-211.

This form, known as *nanga* in the Bacongo dialect and as *cassusso* in the Kimbundu dialect, is the smaller of the two sibling species. Fortunately the photograph of the leg of a cotypical worker by Guiglia (1955) shows the one significant structural difference between *braunsi* and *araujoi* (shape of basitarsus) so that no doubt exists as to which of the species should have the name *braunsi*. Kohl's measurements (length 2.5 to 3 mm.) support this conclusion.

The differences between this species and *araujoi* are indicated in table 1.

The species was described from the Cameroons, and specimens before me are from Dande and Luanda, Angola. Other records (see Friese, 1909) may or may not relate to *braunsi*, *sensu stricto*.

Trigona (Hypotrigona) araujoi, new species

Trigona gribodoi form *landula* PORTUGAL-ARAÚJO, 1955a, p. 105; 1955b, p. 24; 1956, p. 9.

Trigona braunsi form *landula* PORTUGAL-ARAÚJO, 1958, pp. 203-211.

This species is distinguished by the natives from *braunsi*. It is known as *brussuso* in the Bacongo dialect and as *landula* in the Kimbundu dialect. It is not only larger than its close relative, *braunsi*, but is larger than other African *Hypotrigona*.

This species is named for Virgilio de Portugal-Araújo of Luanda, Angola, who first published on the biological distinctions between the forms here separated as species. It is unlikely that the species would have been recognized except for the biological differences; at least the

two principal taxonomic specialists on *Trigona* in the world did not, after examining specimens, regard it as distinct from *braunsi* (or even *gribodoi*) in spite of the biological differences established by Portugal-Araújo.

Trigona (Hypotrigona) araujoii differs from *braunsi* by the characters listed in table 1.

TABLE 1
DIFFERENCES BETWEEN TWO SIBLING SPECIES OF *Trigona*^a

	<i>Cassuso</i> <i>Trigona braunsi</i> Kohl	<i>Landula</i> <i>Trigona araujoii</i> , new species
Entrance of nest	3-4 mm. in diameter; 2-5 cm. long	10 mm. in diameter; 5-7 cm. long
Usual colony population	400-600	2000-2500
Arrangement of brood cells	In clusters	Vertical layers
Honey and pollen pots	5 by 5 mm.	7 by 10 mm.
Temperament	Aggressive when first disturbed	Gentle
Defense of colony	Pouring honey into entrance	Fighting
Robbed by <i>Lestrimelitta cubiceps</i>	Commonly	Rarely
Length	2.5-3 mm.	3.2-4 mm.
Head width	0.54-0.63 mm.	0.67-0.74 mm.
Scutellum	Slightly more shining anteriorly than mesonotum	As dull as mesonotum
Hind basitarsus	Widest beyond middle (fig. 1)	Widest medially (fig. 1)
Hamuli ^b	5	6

^aThe biological differences listed are the more obvious features extracted from the publications of Portugal-Araújo (1955a, 1955b, 1956, 1958). The structural features are based on workers.

^bThis character was found by Alvaro Wille of the University of Kansas. One specimen of *araujoii* had five hamuli on one wing; perhaps one was broken off.

TYPE MATERIAL: Holotype (worker) and 46 paratypes (workers): Luanda, Angola, December 10, 1957; V. de Portugal-Araújo. Thirty paratypes (workers): Dande, Angola, December 10, 1957; V. de Portugal-Araújo.

The holotype and various paratypes will be deposited in the collection of the American Museum of Natural History. Paratypes will be placed in the Snow Entomological Museum, University of Kansas; the British Museum (Natural History); and the collection of J. S. Moure, Curitiba, Paraná, Brazil.

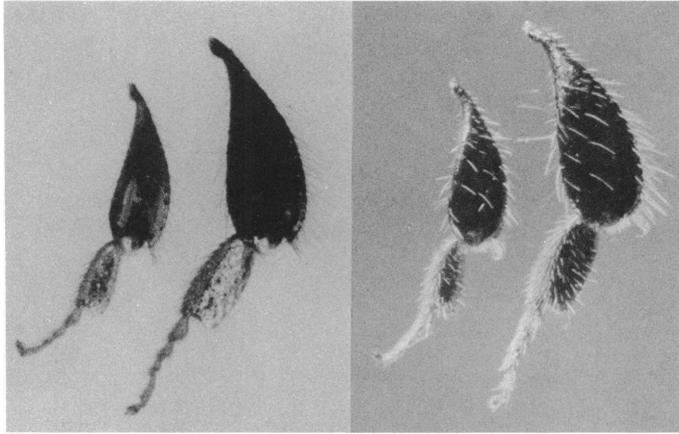


FIG. 1. Outer surfaces of hind tibiae and tarsi of workers of *Trigona braunsi* (small) and *T. araujoii* (large), lighted to show shape (left) and pubescence (right).

Because the principal non-behavioral difference that has been found between *T. braunsi* and *T. araujoii* is size, measurements of head widths of 147 workers of the former and 83 workers of the latter were made. This feature was selected for study simply because it is easily measured.

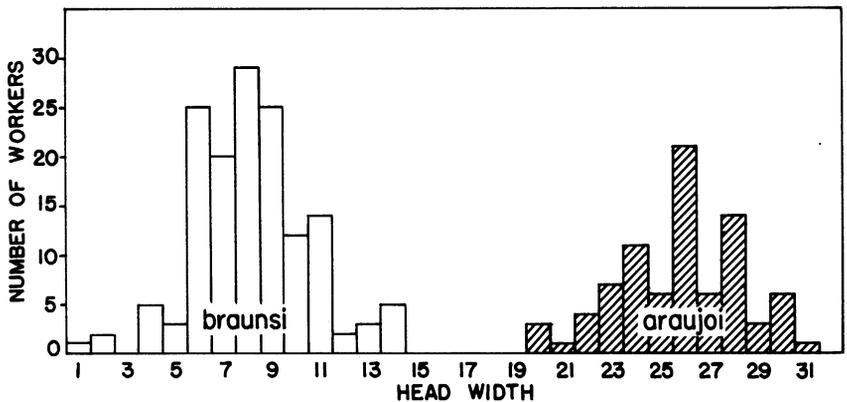


FIG. 2. Histograms to show differences in size between workers of *T. braunsi* and those of *T. araujoii*. Measurements were of the total width of the head. The scale on the abscissa is an arbitrary one, in which each division equals 0.0064 mm., starting with 1 = 0.5440 mm. The widths of the head, in the series measured, vary for *braunsi* from 0.5440 to 0.6272 mm.; for *araujoii*, from 0.6656 to 0.7360 mm.

Figure 2 shows that no overlapping in head width was found between the two species. Sizes of most other structures would probably be equally distinctive. Measurements were made from workers from seven colonies of *braunsi* and four of *araujoi*; within a species, intercolony differences were negligible.

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