



## ARTÍCULO ORIGINAL

### NOTES ON THE MELITTOFAUNA FROM LA TATACOA DESERT, HUILA, COLOMBIA

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#### Abstract

We present a checklist of the melittofauna from La Tatacoa Desert, Department of Huila, a remnant of highly disturbed tropical dry forest located in the upper valley of the Magdalena River. The list consists of 33 species in 20 genera of three families. The most abundant species was the emporine bee *Melitomella schwarzi* (Michener, 1954), which accounted for 43% of the specimens collected. *Exomalopsis (Phanomalopsis) trifasciata* Brèthes, 1910 and *Paratetrapedia connexa* (Vachal, 1909) are newly recorded for Colombia.

**Key Words:** Apoidea, Anthophila, checklist, tropical dry forests

## Introduction

Dry forests are among the most endangered ecosystems in the world. It is estimated that in Colombia alone more than 90% of this ecosystem has been lost and what remains is highly fragmented and disturbed (Pizano et al. 2014). Remnants of dry forests in Colombia occur primarily along the Caribbean coast and the valleys of the Magdalena and Cauca Rivers, and few areas are protected (Espinal and Montenegro 1977, Pizano et al. 2014). Despite several studies on dry forests showing that more than half of its plants are pollinated by bees (e.g., Oliveira and Gibbs 2000, Machado and Lopes 2004), very little is still known about the melittofauna from this ecosystem in Colombia. Although no inventory has yet been conducted in any Colombian dry forest, based on the scattered material deposited in collections, it appears that this ecosystem contains a large number of endemic species, some of them still known from the type specimen or from a few specimens (Gonzalez and Florez 2011, Gonzalez and Griswold 2011, Gonzalez et al. 2012a, Gonzalez et al. 2012b, Gonzalez 2014). Some bee species of the dry forests are important pollinators for Colombian crops and also provide honey, pollen, and wax to local communities. For example, carpenter bees (genus *Xylocopa* Latreille) are widely known as pollinators of species of Passifloraceae, and the highest diversity of these bees in Colombia appears to be found in dry forests (e.g., Cruz 1996, Gonzalez et al. 2009); some species of *Peponapis* Robertson are endemic to dry forests, and they are important pollinators of *Cucurbita* L. crops (Zambrano et al. 2013, Gonzalez

2014). Thus, a better understanding of the melittofauna from this endangered ecosystem in Colombia should be considered a priority to promote the conservation, as well as sustainable use, of this type of forest.

Considering the limited information about the bees from dry forests in Colombia, the purpose of this contribution is to document the melittofauna from La Tatacoa Desert, a remnant of tropical dry forest located in the upper valley of the Magdalena River, Department of Huila, Colombia. We also provide brief comments on the taxonomy and distribution of some species.

## Material and methods

Between January 4 and 8 of 2006, we conducted surveys in five locations in the area known as La Tatacoa Desert, an area of about 335 km<sup>2</sup> of highly disturbed remnant of tropical dry forest that historically has experienced a strong process of desertification (Olaya 2001). All sites were located within the jurisdiction of the municipality of Villavieja (3°13'N, 75°10'W; 400 m.a.s.l.). On each site we set up a line of pan traps and also collected with a net any bee that was seen flying or on the flowers. Each line of pan traps consisted of a total of 80 intercalated blue, white, and yellow plastic bowls (Solo® plastics Soufflé Cup, 3.25 oz.) separated by 3 m each. Pan traps were half filled with soapy water and were set in the morning before 9:00 h and collected 24 h later. Each site was sampled once. Voucher specimens are deposited in the Snow Entomological Collection (SEMC), Division of Entomology, University of Kansas Natural History Museum,

Lawrence, Kansas, USA.

### Results and discussion

We collected a total of 392 specimens belonging to 33 species in 20 genera of three families (Table 1). Many specimens could not be identified at the species level. Apidae was the most species-rich family (21 species). The most abundant species was the emporine bee *Melitomella schwarzi* (Michener, 1954), which accounted for 43% of the specimens collected. This species is found in Panama, Colombia, Venezuela, and northern Brazil (Moure and Melo 2007). In Colombia, this species has previously been recorded from the Department of Magdalena, in the Caribbean region. The presence of this species in the Tatacoa desert indicates that its distribution extends well into the Andean region, such as those of *Anthidium sanguinicaudum* Schwarz, 1933, *Melipona favosa* (Fabricius, 1798), and *Frieseomelitta pauper* (Provancher, 1888) (Gonzalez et al. 2012a), and likely occurring throughout the relicts of dry forests along the Cauca river. *Exomalopsis* (*Phanomalopsis*) *trifasciata* Brèthes, 1910 is recorded for the first

time for Colombia. This species is currently known from Argentina, Bolivia, and southern Brazil (Silveira and Almeida 2008).

Stingless bees were represented by only six (18%) species. Some of them, namely *M. favosa* and *F. pauper*, appear to be restricted to dry forests while others are found across multiple ecosystems in Colombia. The latter case is that of *Trigona fulviventris* Guérin-Méneville, 1844, which also occurs in lowland rain forests as well as in cloud forests (Gonzalez and Engel 2004). Undoubtedly, given the short duration and the small area sampled in this study, many more species are expected to be found in further surveys. Certainly, many species that now appear to be found only in the Caribbean region of Colombia are likely to be collected in the Tatacoa Desert. For example, *Halictus ligatus* Say 1837 and *H. hesperus* Smith 1862 (Halictidae: Halictini) are species widely distributed in Central America and northern South America and have been abundantly recorded in Colombia from the Departments of Magdalena and Cesar (Gonzalez et al. 2012a, personal observations).

**Table 1.** Bees from La Tatacoa Desert (Huila) based on collections from the municipality of Villavieja during January of 2006. \* = newly recorded for Colombia.

TAXA	N°	%
<b>APIDAE</b>		
<b>CENTRIDINI</b>		
<i>Centris</i> ( <i>Centris</i> ) sp.	1	0.26
<i>Centris</i> ( <i>Centris</i> ) <i>varia</i> (Erichson, 1849)	7	1.79
<i>Centris</i> ( <i>Heterocentris</i> ) <i>trigonoides</i> Lepeletier de Saint Fargeau, 1841	4	1.02
<i>Centris</i> ( <i>Melacentris</i> ) <i>obsoleta</i> Lepeletier de Saint Fargeau, 1841	4	1.02
<b>CERATININI</b>		
<i>Ceratina</i> sp.	1	0.26

<b>EMPHORINI</b>		
<i>Ancyloscelis</i> sp.	31	7.91
<i>Diadasia</i> sp.	16	4.08
<i>Melitoma</i> sp.	14	3.57
<i>Melitomella schwarzi</i> (Michener, 1954)	170	43.4
<b>ERICROCIDINI</b>		
<i>Mesoplia</i> sp.	1	0.26
<b>EUCERINI</b>		
<i>Melissodes</i> sp.	14	3.57
<b>EXOMALOPSINI</b>		
<i>Exomalopsis (Phanomalopsis) griswoldi</i> Silveira and Almeida, 2009	4	1.02
<i>Exomalopsis (Phanomalopsis) trifasciata</i> Brèthes, 1910*	2	0.51
<i>Exomalopsis (Exomalopsis)</i> sp.	1	0.26
<b>MELIPONINI</b>		
<i>Frieseomelitta pauper</i> (Provancher, 1888)	6	1.53
<i>Melipona favosa</i> (Fabricius, 1798)	3	0.77
<i>Tetragona</i> sp.	1	0.26
<i>Scaptotrigona</i> sp.	7	1.79
<i>Trigona fulviventris</i> Guérin-Méneville, 1844	4	1.02
<i>Trigona nigerrima</i> Cresson, 1878	3	0.77
<b>XYLOCOPINI</b>		
<i>Xylocopa</i> nr. <i>suspecta</i> Moure and Camargo, 1988	1	0.26
<b>HALICTIDAE</b>		
<b>AUGOCHLORINI</b>		
<i>Augochlora (Augochlora)</i> sp.	2	0.51
<i>Augochlora (Oxystoglossella)</i> sp.	21	5.36
<i>Augochloropsis</i> sp.	7	1.79
<i>Augochlorella</i> sp.	1	0.26
<b>HALICTINI</b>		
<i>Lasioglossum (Dialictus)</i> sp. 1	24	6.12
<i>Lasioglossum (Dialictus)</i> sp. 2	8	2.04
<i>Lasioglossum (Dialictus)</i> sp. 3	1	0.26
<i>Lasioglossum (Dialictus)</i> sp. 4	2	0.51
<i>Lasioglossum (Dialictus)</i> sp. 5	19	4.85
<i>Lasioglossum (Dialictus)</i> sp. 6	8	2.04
<i>Lasioglossum (Dialictus)</i> sp. 7	3	0.77
<b>MEGACHILIDAE</b>		
<b>MEGACHILINI</b>		
<i>Megachile</i> sp.	1	0.26
<b>Total</b>	392	-

Surveys in locations along the Magdalena and Cauca rivers are necessary to understand the full distribution of the species inhabiting Colombian dry forests as well as to identify areas of endemism and diversity. The melittofauna from areas along the interandean valleys remains virtually unknown, and they surely contain a

unique and diverse fauna. For example, *Paratetrapedia connexa* (Vachal 1909) has been collected from Puerto Parra (Department of Santander), a locality in the lower Magdalena river basin. Although this species occurs from Costa Rica to Peru, it has not previously been recorded from Colombia. Thus, this species is herein newly recorded for the country. The label data of the female specimen deposited in SEMC are as follow: "Colombia, Santander, Pto. Parra, Vda. La India Baja. Finca Miraflores. 6°41'50.7"N, 73°53'31.2W. January 10, 2005. V. Gonzalez".

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