



## New distribution records of four *Drosophila* species (Diptera, Drosophilidae) in Mato Grosso, Brazil.

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### Introduction

Mato Grosso is the third largest state in Brazil and encompasses three biomes: Amazonas, Cerrado and Pantanal. The Cerrado is the most widely distributed and threatened biome of the state and is considered one of the 25 biodiversity hotspots for conservation in the world (Myers 2000). In 2008, just 30 species of Drosophilidae were recorded in the state, a very low number compared to the number of species recorded in the states of São Paulo, Santa Catarina, and Rio Grande do Sul (review in Gottschalk *et al.*, 2008). These data suggest that few studies of the family Drosophilidae have been conducted in this vast Brazilian region. In 2007, our group conducted a taxonomic survey of the geographical distribution of fifteen species of Drosophilidae in Brazil, which included common species such as *Drosophila melanogaster*, *D. hydei*, and *D. mercatorum* (Blauth and Gottschalk, 2007). In the present study, we documented the first observations of four species in a forested fragment of urbanized perimeter in Mato Grosso, Brazil.

### Material and Methods

In June 2008, samples were collected in Parque Natural Ilto Ferreira Coutinho, or Bosque Municipal, a highly anthropized, forested area of 11.77 ha, in Tangará da Serra, Mato Grosso (14°37'39.61"S, 57°29'35.29"W) (Figure 1). Samples were collected in 10 traps constructed according to Tidon and Sene (1988) and baited with banana and commercial yeast. The traps were suspended at a height of 1.5 m, placed in a line, distanced 30 m apart, and kept in the field for three days. The identification of specimens was based on external morphology, and sibling males were identified by genitalia and were then dissected and prepared according to Bächli *et al.* (2004).

### Results

A total of 497 individuals of 16 species were collected (Table 1). *Drosophila malerkotliana* was the dominant species collected, followed by *Z. indianus*; both are considered exotic species in the Neotropical Region. Each of the remaining 14 species had an absolute abundance lower than 20 individuals, amounting to a total of 103 individuals.

Table 1. Absolute abundance of Drosophilidae sampled at Parque Natural Ilto Ferreira Coutinho in Tangará da Serra, Mato Grosso, Brazil.

Genus	Group	Species	males	females	Total	
<i>Drosophila</i>	<i>annulimana</i>	<sup>1</sup> <i>D. annulimana</i> Duda, 1927	1	2	3	
		<i>cardini</i>	<i>D. cardini</i> Sturtevant, 1916	5	12	17
			<i>D. cardinoides</i> Dobzhansky & Pavan, 1943	3	0	3
	<i>melanogaster</i>		<i>D. malerkotliana</i> Parshad & Paika, 1964	173	141	314
			<i>D. melanogaster</i> Meigen, 1830	0	1	1
			<i>D. simulans</i> Sturtevant, 1919	9	11	20
	<i>repleta</i>		<sup>1,2</sup> <i>D. mapiensis</i> Vilela & Bächli, 1990	1	0	1
			<i>D. mercatorum</i> Patterson & Wheeler, 1942	1	1	2
			<sup>1</sup> <i>D. papei</i> Bächli & Vilela, 2002	1	0	1
			<sup>1,2</sup> <i>D. querubimae</i> Vilela, 1983	1	0	1
	<i>saltans</i>		<i>D. prosaltans</i> Duda, 1927	4	7	11
			<i>D. sturtevanti</i> Duda, 1927	12	7	19
		<i>willistoni</i>	<i>D. nebulosa</i> Sturtevant, 1916	1	1	2
<i>willistoni</i> subgroup			7	5	12	
<i>Scaptodrosophila</i>	<i>latifasciaeformis</i>	<i>S. latifasciaeformis</i> Duda, 1940	6	4	10	
<i>Zaprionus</i>	<i>armatus</i>	<i>Z. indianus</i> Gupta, 1970	25	55	80	
Total			250	247	497	

<sup>1</sup> First record in Mato Grosso, Brazil. <sup>2</sup> First record in the Cerrado biome.

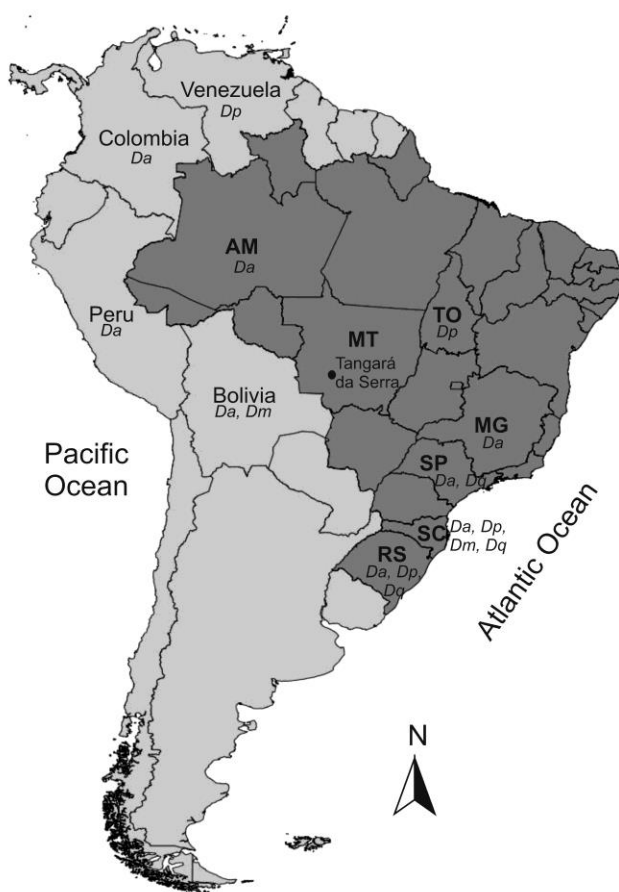


Figure 1. Map of South America highlighting in dark gray the map of Brazil. The map indicates the first records of *D. annulimana* (Da), *D. mapiensis* (Dm), *D. papei* (Dp), and *D. querubimae* (Dq) in Tangará da Serra, Mato Grosso (MT). Previous records of these species in Brazilian states and neighboring countries are indicated: (AM) state of Amazonas, (TO) state of Tocantins, (MG) state of Minas Gerais, (SP) state of São Paulo, (SC) state of Santa Catarina, and (RS) state of Rio Grande do Sul.

Four of these species are rare and newly recorded in Mato Grosso: *D. annulimana*, *D. mapiriensis*, *D. papei*, and *D. querubimae* (Figure 1). We also documented the first observations of *D. mapiriensis* and *D. querubimae* in the Cerrado biome.

## Discussion

Despite being newly recorded in Mato Grosso, *D. annulimana* is amply distributed in Brazil and has been recorded in Amazonas, Minas Gerais, Santa Catarina, São Paulo (review in Gottschalk *et al.*, 2008), and Rio Grande do Sul (Garcia *et al.*, 2008; Garcia *et al.*, 2009; Garcia *et al.*, 2012). This species also occurs in Bolivia, Colombia, and Peru (Hunter, 1964; Vilela and Bächli, 1990; Villamizar and Álvarez, 2010).

*Drosophila papei* was previously recorded in Santa Catarina, Atlantic Forest biome (Gottschalk *et al.*, 2006), and in the state of Tocantins, Cerrado biome (Mata *et al.*, 2008). In each of the previous studies, only one individual was sampled. Three individuals were sampled in Rio Grande do Sul, a transitional area of the Atlantic Forest and Pampa biomes. Despite this species low abundance and rarity (six individuals sampled in Brazil until now), it seems that the species were widely distributed in Brazil, reaching Venezuela as the northern limit (Vilela and Bächli, 2002).

*Drosophila querubimae* was previously recorded in São Paulo (Vilela, 1983; Medeiros and Klaczko, 2004), and Santa Catarina (Gottschalk *et al.*, 2006), both in the Atlantic Forest biome, while *D. mapiriensis* was previously recorded in Santa Catarina (Gottschalk *et al.*, 2006; Dogë *et al.*, 2008; Bizzo *et al.*, 2012). These species were more abundant in urban areas of Santa Catarina than in forested areas (Gottschalk *et al.*, 2006).

Despite the few records of these species in the literature, *D. papei*, *D. querubimae*, and *D. mapiriensis* were not recorded in other sampling events carried out in Mato Grosso by our research group (unpublished data; Blauth and Gottschalk, 2007), which included pasture forest fragments and crop matrices.

This study contributes important information on the geographic range and distribution of Neotropical Drosophilidae species, furthering our understanding of the habitat of these species.

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