Table 1. Egg to adult development time of the *cardini* group at the Tucson *Drosophila* Stock Center.

Species	Days	Temperature (ºC)
subgroup *dunni*		
D. dunni	15	18
D.nigrodunni	15.5	18
subgroup *cardini*		
D. cardinoides	15	18
D. neocardini	15	18
D. parthenogenetica	15	18
D. polymorpha	15	18
D. procardinoides	15	18

Table adapted from Markow & O'Grady, 2006

In any case, the differences were small and were within the expected length for the *cardini* group, as shown in Table 1. The fact that in this experiment the flies were kept at higher temperatures may be the reason for acceleration of the cycle. Also, the San Diego *Drosophila* Stock Center maintains its flies of the *cardini* group at temperatures between 18-25°C, and reports life cycles between 12-16 days, depending on the species and the temperature used. Still, this study enriches the literature, recounting the life cycle in more detail.

For the majority of species, freshly hatched adults are not sexually mature (Markow, 1996), and *D. polymorpha* keep this pattern. In fact, sexual maturity may require up to several weeks, depending on the species (Markow and O'Grady, 2006). While males of some species mature earlier than females, most males mature later than females (Markow and O'Grady, 2008). The results of our work indicate that this species belongs to the first case, similar to *D. melanogaster* that requires 4 days for females to mature and 2 days for males. Equally they are unlike *D. mojavensis* that requires 3 days for females to mature and 7 for males. Furthermore, it can be seen that there is much variation in time between the three species mentioned, a fact that can be justified by the phylogenetic distance between them.

Aiming to map the start of sexual maturity for South Brazilian non-inbreeding lines, more experiments will need to be performed using this species, especially owing to the high mortality rate. Also, the flies' courtship behavior should not necessarily be considered a fully decisive indication of sexual maturity. This is demonstrated by the fact that immature males can achieve copulation without releasing sperm, and females can become sexually receptive before they in fact present mature eggs (Markow, 1996). Furthermore, because metabolic waste from males, present in the culture medium, can change the age at which sexual maturity is reached (Joshi *et al*., 1998), new isolines have been collected in order to reinforce the data obtained from this study.

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Drosophila **collections in the Arc of Deforestation, Brazil.**

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Introduction

The region known as "Arc of Deforestation" covers a massive Amazonian frontier (Figure 1) and shows alarming rates of clearcutting. Close to half of the world's tropical deforestation occurs in

this region (TNC, 2010) due to unplanned clearing for pasture and crops. Therefore, it is a priority area for research and conservation studies.

Although drosophilid field studies have been expanding in Brazil (Gottschalk *et al.*, 2008), the collection sites are distributed unevenly across the country. There is a concentration of efforts near urban centers (Santos *et al.*, 2011), and great areas of gaps. The most critical situations are found in the States of Mato Grosso, Maranhão, Tocantins, and Piaui (Chaves and Tidon, 2008).

This study presents a preliminary evaluation of the drosophilid fauna from two areas in the northeast of Mato Grosso that have never been sampled before. Hence, it fills a gap in the knowledge of drosophilid species distribution in an endangered neotropical region.

Material and Methods

The collections were made in the northeast of the State of Mato Grosso (Figure 1), in a transition area between the Cerrado and Amazon Forest biomes, using banana-baited traps (Roque *et al*., 2011). The first site, Fazenda Tanguro situated in *Querência* County (13°05' S, 52°22'W), was sampled in September 2012 using 16 traps. The second site, Fazenda Destino in *Ribeirão Cascalheira* County (12°52'S, 52°05'W), was sampled in July 2013 using 30 traps. All traps were placed in forest patches.

The specimens were identified to the species level, whenever possible, through external morphology and male terminalia in the case of cryptic species. Vouchers of the captured species were deposited at the Collection of the *Laboratório de Biologia Evolutiva da Universidade de Brasilia*.

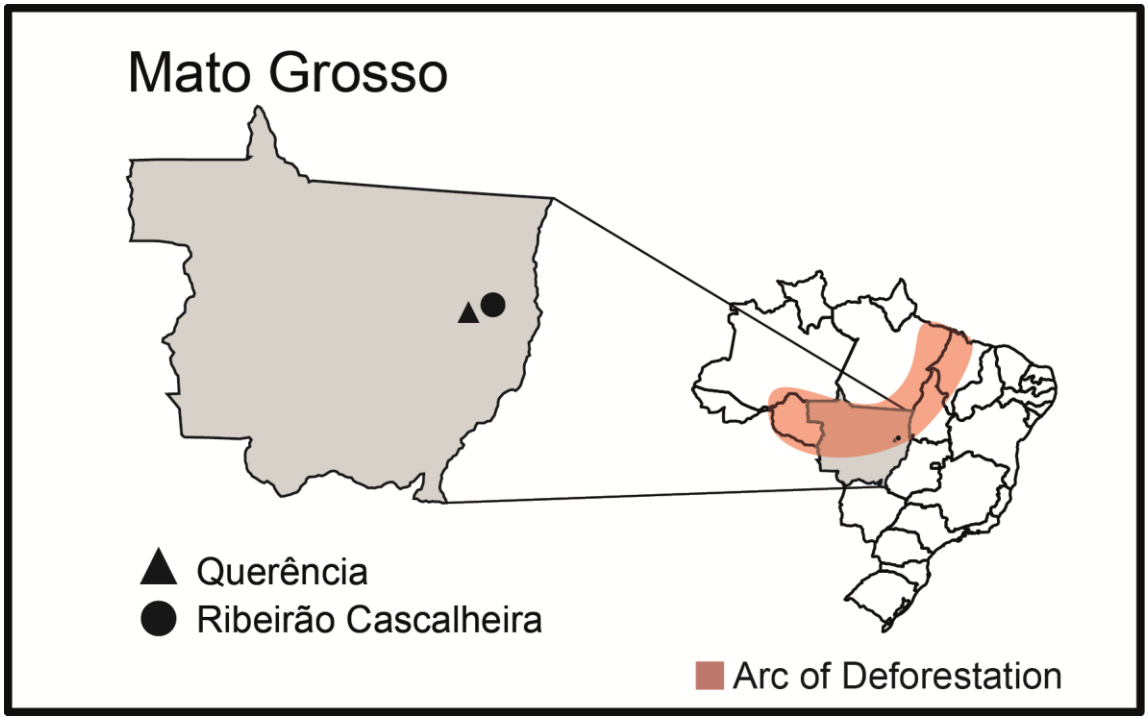

Figure 1. Location of the sampled sites in the Arc of Deforestation, State of Mato Grosso, Brazil.

Table 1. Total and relative abundance (%) of drosophilid species at two sites in the State of Mato Grosso, located in the Brazilian Arc of Deforestation.

Species	*Querência*		*Ribeirão Cascalheira*	
	Total	(%)	Total	(%)
Drosophila annulimana Duda	-		1	(0.04)
D. ararama Pavan & Cunha	-		2	(0.07)
D. cardini Sturtevant	7	(3.80)	1	(0.04)
D. fumipennis Duda	-		7	(0.26)
*D. marlekotliana** Parshad & Paika	-		6	(0.22)
D. mediostriata Duda	-		10	(0.36)
D. mercatorum Patterson & Wheeler	7	(3.80)	-	
D. nebulosa Sturtevant	168	(91.30)	691	(25.10)
D. neocardini Streisinger	-		1	(0.04)
D. nigricruria Patterson & Mainland	1	(0.54)	-	
D. quadrum Wiedemann	-		2	(0.07)
D. sturtevanti Duda	1	(0.54)	12	(0.44)
*Scaptodrosophila latifasciaeformis** (Duda)	-		1	(0.04)
*Zaprionus indianus** Gupta	-		16	(0.58)
Group *D. coffeata*	-		2	(0.07)
Group *D. repleta*	-		4	(0.15)
Group *D. tripunctata*	-		5	(0.18)
Group *D. saltans*	-		4	(0.15)
Subgroup *D. willistoni***	-		1988	(72.20)
Total	184		2753	

* Exotic species.
** *D. willistoni*, *D. paulistorum* and *D. tropicalis*.

Results and Discussion

A total of 2,937 individuals representing 14 nominal species were sampled, besides several unidentified species from the groups *Drosophila coffeata, D. repleta, D. tripunctata, D. saltans,* and the subgroup *D. willistoni* (Table 1). Among them, three species are exotic: *Drosophila malerkotliana, Scaptodrosophila latifasciaeformis,* and *Zaprionus indianus*. All neotropical species are from the *Drosophila* genus.

The two sampled locations revealed singular drosophilid assemblages. The difference in abundance certainly reflects sampling effort, but may also reveal the high spatial and temporal environmental heterogeneity of the biome. The drosophilid community in *Querência,* sampled at the end of the dry season, was poorer in species and strongly dominated by *Drosophila nebulosa,* a well-adapted species to arid areas. *Ribeirão Cascalheira* was richer in neotropical species associated to forests and dominated by the *D. willistoni* subgroup. Several species still need taxonomic determination; some of them can be new species.

This brief catalogue, based on samples collected in an endangered and highly diverse area considered a gap in the knowledge of drosophilid distribution, recorded at least 20 nominal species of drosophilids. We are aware that we have sampled only a fraction of the species that should occur in

this area and that more collections are needed. Therefore, the present study aggregates a basis for future modeling, conservation efforts, and emphasizes the need for a broader sampling.

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Chronic exposure to tunicamycin during development has little effect upon the eyes of *GMR-Gal4 UAS-lacZ* males.

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Introduction

Endoplasmic reticulum (ER)-stress is caused by the intracellular accumulation of proteins and is implicated in several degenerative disease states (Boyce and Yuan, 2006; Haeri and Knox, 2012). Although characterized as a source of cellular damage, the ER-stress response to mild insult (ER pre-conditioning) has been demonstrated to be protective in *Drosophila* through an autophagy-dependent process (Fouillet *et al.,* 2012). In part, this response was achieved through acute exposure by feeding flies - for only four hours - with a medium containing tunicamycin, an antibiotic that inhibits glycosylation. Although this approach proved quite successful, a set of conditions that allow for chronic exposure to produce a continual level of protection or damage is very desirable.

Several avenues of research into ER-stress in *Drosophila* may depend upon the use of the *UAS/Gal4* system (Brand and Perrimon, 1993) to express various transgenes under conditions of stress. Our laboratory has characterized apoptosis-dependent developmental defects caused by *GMR-Gal4*^{12} (Kramer and Staveley, 2003; unpublished) under conditions of elevated temperatures and increased gene-dosage. As a result, we investigated the possibility that induction of ER-stress by tunicamycin might induce toxic effects when coupled with normally non-detrimental levels of *Gal4* expression controlling a standard *lacZ* transgene.

Materials and Methods

Drosophila *media*

The standard cornmeal-yeast-molasses-agar medium in our laboratory is made with 65 g/L cornmeal, 10 g/L nutritional yeast, and 5.5 g/L agar in water, heated to form a slurry, then cooked by autoclave @ 30 minutes under standard conditions for liquids. This is supplemented with 50 ml/L fancy grade molasses after cooking and with 5 ml of 0.1 g/ml methyl paraben (methyl 4-hydroxybenzoate from Sigma Life Science Research: *www.sigma.com*) in 95% ethanol and 2.5 ml of propionic acid when cooled to 55 to 60°C prior to decanting into standard plastic shell vials. Once