

A scientific note on the occurrence of Euglossini bees in the Caatinga, a Brazilian tropical dry forest*

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Euglossini bees (Apidae) are an exclusively Neotropical monophyletic group of five genera (*Aglae*, *Eufriesea*, *Euglossa*, *Eulaema*, and *Exaerete*) with 190 species, (Rebêlo, 2001; Ramírez, 2005). In Brazil, the second most diverse country in Euglossini species (Ramírez et al., 2002), 80 species are referred for the Amazon, 57 for the Atlantic forest, and 23 for the Cerrado (Rebêlo, 2001). Despite this high richness, new species continue to be described (Ramírez, 2005) and known species are still being recorded from new locations (Nemésio and Silveira, 2004).

The Caatinga, a semi-arid ecosystem unique from Brazil, is a deciduous forest with scrub vegetation. It occurs in areas of low and highly seasonal rainfall (500–700 mm/year), and covers 800 000 km² of Brazil's territory (ca. 8.6%) in the northeastern region (Leal et al., 2003). It was estimated that more than 40% of its plant species relies on bees for pollination (Machado and Lopes, 2004). However, the Caatinga apifauna is still poorly known (Zanella, 2000; Zanella and Martins, 2003).

The aim of this paper is to review and report new records of Euglossini bees for the Caatinga region. We inventoried five sites located in the states of Pernambuco (PE) and Ceará (CE), Brazil (see material online) by attracting Euglossini males using odour

baits (skatole, methyl salicylate, β -ionone, vanillin, benzyl acetate, and eucalyptol), as established by Dodson et al. (1969) and broadly applied by numerous authors. Individuals were attracted from 8:00 to 12:00 h, according to usual protocols for Euglossini male collection (e.g. Pearson and Dressler, 1985; Wittmann et al., 2000; Rebêlo 2001; Pemberton and Wheeler, 2006, and references therein). The filter papers used as baits were saturated each 30 min. with the fragrances to ensure efficiency. Specimens preparation followed usual protocols in entomology and were deposited in the collection of the Laboratory of Floral and Reproductive Biology at the Universidade Federal de Pernambuco, Brazil. For *Eulaema* individuals, easily identified in the field, the first specimen captured was kept as testimonial, and the following were marked with non-toxic ink, then released.

In total, 173 individuals from three species were collected: *Eulaema nigrita* (Lepeletier, 1841), *Euglossa cordata* (Linnaeus), 1758, and *Eg. securigera* Dressler, 1982 (Tab. I). In a previous revision on bees of the Caatinga only three species of Euglossini were referred to this entire ecosystem: *El. nigrita*, *Eg. securigera*, *Eufriesea nordestina* Moure, 1999 (Zanella, 2000). Zanella (2000), during a “year-round survey”, collected only one species of Euglossini (*El. nigrita*). Subsequently, Martins et al. (2003) referred to another species, *Eg. melanotricha* Moure, 1967, in a Caatinga area. By recording *Eg. cordata* in the present study, five species are now known for the Caatinga. This species was also found to occur in Altitudinal forests (“Brejos de Altitude”) surrounded by Caatinga in Pernambuco state, and was seen to leave

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Table I. Euglossini species attracted to odour baits at four Caatinga sites (1. Mombaça-CE; 2. Missão Velha-CE; 3. Lagoa Grande-PE; 4. Crato-Arajara-CE), and one site of Dense Montane forest (5. Floresta Nacional do Araripe-CE) in the States of Pernambuco (PE) and Ceará (CE), northeastern Brazil.

	Sites (number of individuals)					Total	
	1	2	3	4	5	N	%
<i>Eulaema nigrita</i>	36	8	-	27	63	134	77.4
<i>Euglossa cordata</i>	5	6	3	9	14	37	21.4
<i>Euglossa securigera</i>	2	-	-	-	-	2	1.2
Total abundance	43	14	3	36	77	173	100

these forests to nearby agroforests (Wittmann et al., 2000).

The low richness of these bees in the Caatinga was expected since the distribution of this tribe is strongly associated with humidity (Rebêlo, 2001). Even in Montane forests, surrounded by dry forests, the richness of Euglossini was low compared with values for the Atlantic and Amazon ones (Rebêlo, 2001). Due to its rarity, it is suggested that interactions between plants and Euglossini bees in the Caatinga focus on the dependence of each mutualist.

Our findings are relevant because they (1) increase the number of Euglossini bees registered for the ecosystem, (2) compile and update "orchid bee" geographic distribution for the ecosystem, providing information for the comprehension of the biogeographic relations between the Caatinga and other ecosystems (see Prado, 2003; Zanella and Martins, 2003), and (3) make available information for conservation planning and management, including agroforestry initiatives.

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Note scientifique sur la présence des abeilles Euglossini dans le Caatinga, forêt sèche tropicale du Brésil.

Eine wissenschaftliche Notiz über das Vorkommen von Euglossinen Bienen in der Caatinga, einem tropischen Trockenwald in Brasilien.

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Online Materials

Table. Sites inventoried in the States of Pernambuco (PE) and Ceará (CE), northeastern Brazil.

Location	Coordinate	Altitude	Site description
1. Mombaça (CE)	05°39'53" S 39°37'00" W	278 m	Caatinga area with dense shrubs and trees, surrounded by lakes/basins, marked by the occurrence of <i>Auxemma oncocalyx</i> (Boraginaceae), a tall tree endemic of the CE and Rio Grande do Norte States
2. Missão Velha (CE)	07°18'09" S 39°01'13" W	450 m	Shrubby Caatinga. Evidence of intense antropic activity (e.g. logging, burning, cattle trails)
3. Lagoa Grande (PE)	08°49'58" S 40°10'33" W	450 m	Shrubby Caatinga. Numerous tall individuals of <i>Schinopsis brasiliensis</i> (Anacardiaceae), and <i>Anadenanthera macrocarpa</i> (Leguminosae); <i>Jatropha</i> spp. (Euphorbiaceae) was also highly present
4. Crato-Arajara (CE)	07°15'48" S 39°23'38" W	500 m	Caatinga area marked by the presence of many tree species, and surrounded by agroforests
5. Floresta Nacional do Araripe, Crato (CE)	07°18'31" S 39°27'12" W	923 m	Dense Montane forest area surrounded by Caatinga