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RESEARCH ARTICLE

An assessment of leaf-litter and epigaeic ants (Hymenoptera: Formicidae) living in different landscapes of the Atlantic Forest Biome in the State of Bahia, Brazil

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Abstract: The Brazilian Atlantic Forest has a rich biodiversity increasingly threatened by human activities. Since the colonial period, the coast of the state of Bahia is among the most affected regions of Brazil by anthropic pressure. Bahia encloses Atlantic Forest remnants distributed in an area reaching 100-200 km along the east-west axis, by 1,000 km along the north-south axis, parallel to the coast of the Atlantic Ocean. We report hereafter the results of an intensive field survey of leaf litter and epigaeic ants realized in forest remnants of the Atlantic Forest landscapes within the original extension of the biome in 11 localities distributed along four degrees of latitude in the state of Bahia. In each site, 16 plots were collected using pitfall and eight using Winkler traps. We identified 391 ant species belonging to 71 genera and nine subfamilies. Among all species recorded, 21 were common to the whole 11 localities, while 98 species were recorded in a single locality. This study highlights the richness and diversity of epigaeic and leaf-litter ants living in the northern part of the Brazilian Atlantic Forest, and is one of the most representative soil ants' inventories ever done in this biome for a single state of Brazil.

Key words: Neotropical Region, diversity, remnants, conservation, Formicidae.

Introduction

The Atlantic Forest is one of the richest biomes in diversity from Brazil while it is historically also one of the more impacted by man (Dean 1995; Tabarelli *et al.* 2005; Tonhasca Jr. 2005). This biome is considered one of the 35 biodiversity hotspots on the earth, which correspond to regions with high rates of biodiversity and endemism that are highly threatened by human activities (Myers *et al.* 2000; Zachos & Habel 2011). In Brazil, the Atlantic Forest originally covered an area of 1,315,460 km², corresponding to about 15% of the country. Currently, it retains only 7.9% of its original vegetation coverage (Fundação SOS Mata Atlântica 2010), disseminated in a range of small fragments of irregular sizes (generally less than 50 ha), with a low rate of connectivity (Ribeiro *et al.* 2009, 2011). Currently it is estimated that only 0.4% of the original forest remains intact (Thomas & Britton 2008). Among the regions of the biome affected by anthropic pressure, large parts of the Atlantic forest situated in the state of Bahia are among the landscapes most affected by man in the country since the Portuguese colonization (Landau *et al.* 2008).

In southern Bahia, remnants of the Atlantic Forest are distributed in an area reaching 100-200 km east-west, by 1,000 km along a north-south axis, following the Atlantic coast line (Thomas *et al.* 2008). This region is exceptionally rich for endemism, where live many exclusive animals and plants that are often threatened by land fragmentation or habitat degradation (Pacheco & Gonzaga 1995; Pacheco *et al.* 1996; Thomas & Britton 2008).

Among other organisms, the Atlantic Forest hosts a high rate of endemism and diversity of terrestrial invertebrates too, where the ants are prominent (Brown 1991; Silva & Brandão 2014). Many endemic ant species live in the Brazilian Atlantic Forest, such as the two endemic genera *Diaphoromyrma* and *Phalacromyrmex* (Kempf 1972a; Fernández *et al.* 2009). In southern Bahia, most of the knowledge about ants is relative to the forest remnants and plantations of the cocoa producing region (Delabie *et al.* 2007). Noteworthy is the fact that the threatened ant species *Anochetus hohenbergiae* Feitosa & Delabie, 2012, *Anochetus oriens* Kempf, 1964, *Diaphoromyrma sofiae* Fernandes, Delabie & do Nascimento, 2009, *Dinoponera lucida* Emery, 1901, *Fulakora cleae* Lacau & Delabie, 2002 and *Gnamptogenys wilsoni* Lattke, Fernández & Palacio, 2007 occur exclusively in the forests and agroforests situated in the Central Corridor of the Atlantic Forest (Mariano *et al.* 2008; Fernández *et al.* 2009; Feitosa *et al.* 2012).

Although the Atlantic Forest of the state of Bahia and its associated agrosystems were extensively sampled for ants during the last 30 years, no inventory reporting the ant diversity along the extension of the biome has been published for the state yet. The purpose of the commented list of ants that follows and which results from an intensive field survey in landscapes remnants of the Atlantic Forest of Bahia, is to fill this gap and furnish tools for further studies on ant communities in this region of Brazil.

Material and methods

The localities where the samples were taken were selected based on the 2008's map of remnants of the Atlantic Forest by SOS Atlantic Forest Foundation and National Institute for Space Research (INPE, Brazil) (see Rigueira *et al.* 2013). For this study, 11 forest remnants (maximum distance: 700 km) were sampled distributed in different regions of the Atlantic Forest biome (hereafter called Forest Landscapes: FL) in the state of Bahia (Fig. 1). In each locality (Table 1), we collected the ants at sampling points on 16 plots (pitfall traps) and 8 plots (Winkler traps) including areas of the biome Atlantic Forest in medium and advanced stage of succession, and low size phytophysiognomy (pastures, fields or herbaceous/shrub plantations). The FL were sampled from 2011 to 2012, and the sequence of the sampling per location was random.

Table 1. Characterization of the localities sampled for ants in the Atlantic Forest biome, state of Bahia, Brazil, 2011-2012.

Localities/ Code	Geographic Coordinates	Forest Type*	Stage of succession	Elevation (m)
Ilhéus (ILH)	S14°44'32''W39°06'20''	Dense Ombrophylous	Initial/ Medium	46
Presidente Tancredo Neves (PTN)	S13°23'28''W39°19'06''	Dense Ombrophylous	Medium	169
Itapetinga (ITA)	S15°14'46''W39°56'25''	Semideciduous Seasonal	Medium	240
Valença (VAL)	S13°20'32''W39°11'43''	Dense Ombrophylous	Medium	175
Ubaíra (UBA)	S13°07'19''W39°39'34''	Submontane Ombrophylous	Advanced	881
Nilo Peçanha (NP)	S13°38'58''W39°12'37''	Dense Ombrophylous	Advanced	195
Wenceslau Guimarães (WG)	S13°33'14''W39°42'07''	Submontane Ombrophylous	Medium/ Advanced	485
Camamu (CAM)	S14°00'51''W39°10'56''	Dense Ombrophylous	Medium/ Advanced	168
Iguaí (IGU)	S14°38'38''W40°09'12''	Submontane Ombrophylous	Advanced	907
Jaguaripe (JAG)	S13°11'44''W39°01'26''	Dense Ombrophylous	Medium	81
Itamarajú (TAM)	S16°59'30''W39°27'19''	Dense Ombrophylous	Medium/ Advanced	247

* Classification of phytophysiognomy according Veloso et al. (1991).

The ants were collected with the use of pitfall and Winkler traps (Bestelmeyer *et al.* 2000). In each plot, we disposed 10 sampling sites along a transect at intervals of 10 meters. At each site, we disposed four pitfall traps formed by plastic buckets of 35 liters distributed in Y (originally used for vertebrate collection [see Estavillo et al., 2013] and connected by a canvas strip close to the ground of 50 cm length and 15 cm height). Each pitfall was filled (one third of its volume) with a fixative liquid solution. The 40 pitfalls in total per transect were recombined to form a single sample. A total of 176 (11 localities x 16 plots) samples of epigeaic ants captured using pitfall traps were obtained.

For the study of the ants of leaf-litter, we collected 1 m² of forest leaf litter at four different points disposed at intervals of 20 meters along each transect. The fauna of the leaf litter samples was extracted with a Winkler extractor (Bestelmeyer *et al.* 2000) for 48h at laboratory. We obtained 88 samples of leaf-litter ants captured by Winkler trap (11 localities x 8 plots). The total number of species expected in the biome along the different regions sampled with the same methodology was estimated with the package vegan in R-software, version 3.3.2 (R Development CoreTeam, 2017).

In all cases, the biological material (obtained from pitfall and Winkler traps) was fixed in 90% ethanol for further study in laboratory. After preparation for entomological collection, the ants were identified by comparison with the biological material of the CPDC collection kept at the Myrmecology Laboratory CEPEC-CEPLAC, Cocoa Research Center, at Ilhéus, Bahia, Brazil and through literature consultation. Representative vouchers of each species were deposited in this collection under the reference numbers of the series #5772 to #5782.

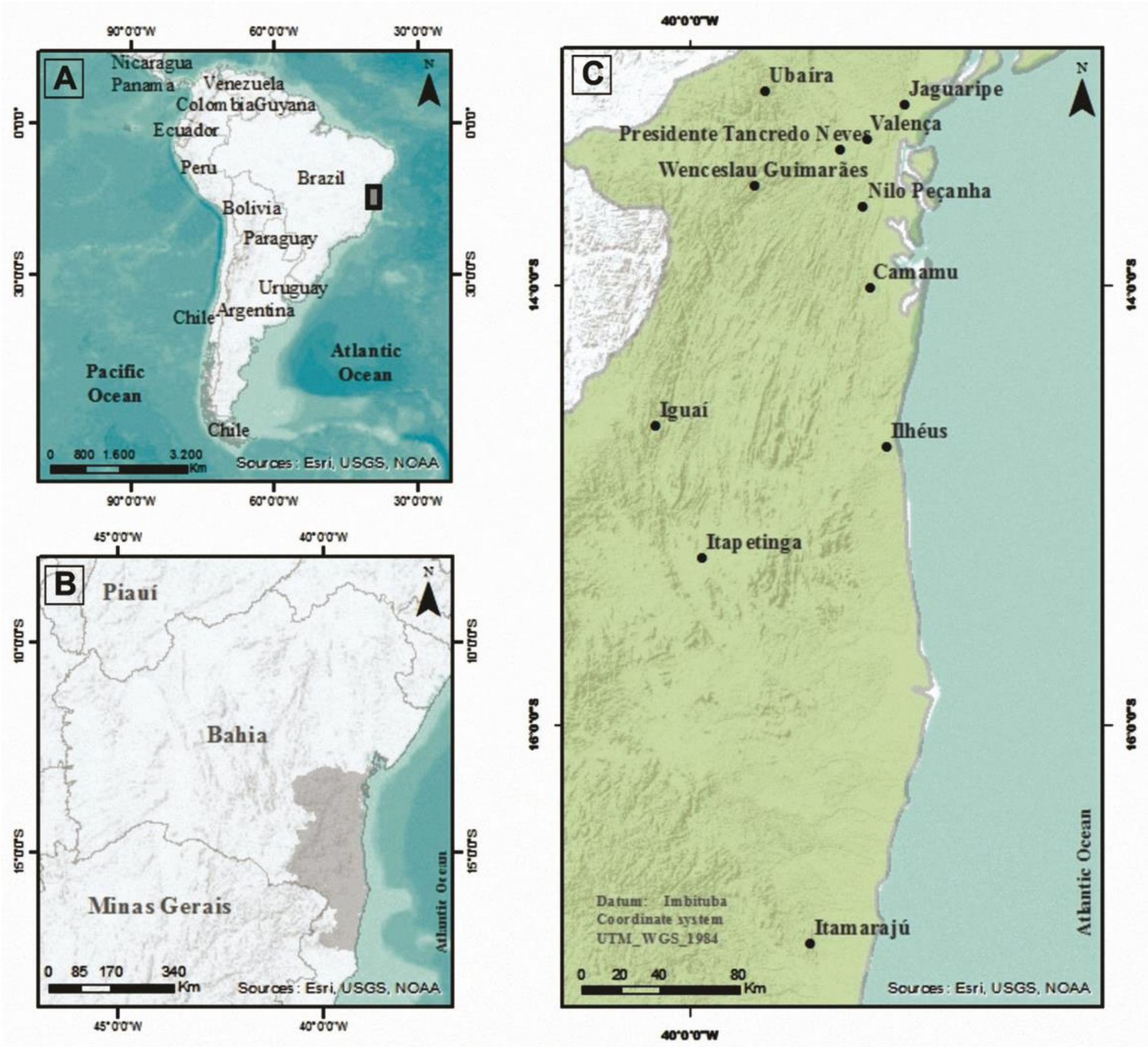

Figure 1. Areas sampled (Atlantic Forest remnants) in the state of Bahia, Brazil. **A,** South America; **B,** state of Bahia; **C,** regional map.

Results

We found 391 ant species (from 5,001 specimens) in the whole study, representing 71 genera and nine subfamilies (Table 2), of which the most representative were: Myrmicinae (52.5% of the species), Ponerinae (16.6%), Formicinae (12.5%) (Table 2). Only in Iguaí (IGU), we observed the occurrence of nine subfamilies of Formicidae, since it was the only locality in which we recorded Amblyoponinae and Heteroponerinae representatives. The number of subfamilies in other localities studied varies between seven and eight (Tables 2 and 3).

The total number of genera by localities varies from 34 (in Camamu, Itapetinga and Nilo Peçanha) to 53 (in Iguaí) (Table 3). Among the 71 genera of ants recorded in the whole experiment, 18 were present everywhere. The 10 commonest genera were: *Pheidole* (64 spp., 918 records), *Camponotus* (29 spp., 407 records), *Odontomachus* (eight spp., 307 records), *Solenopsis* (11 spp., 288 records), *Ectatomma* (five spp., 262 records), *Strumigenys* (nine spp., 186 records), *Pachycondyla* (eight spp., 183 records), *Neoponera* (16 spp., 175 records), *Crematogaster* (14 spp., 172 records) and *Nylanderia* (nine spp., 145 records) (Fig. 2). Nine genera (*Acanthostichus*, *Basiceros*, *Centromyrmex*, *Cerapachys*, *Dinoponera*, *Mycetophylax*, *Oxyepoecus*, *Stegomyrmex* and *Tranopelta*) were observed each one in a single locality only (Table 2).

Table 2. Frequency of occurrence of ants (number of samples in which the species was recorded) collected with pitfall and winkler traps in 11 landscapes distributed in the Atlantic Forest biome in the state of Bahia, Brazil. Localities: ITA: Itapetinga, UBA: Ubaíra, WG: Wenceslau Guimarães, IGU: Iguaí, TAM: Itamarajú, ILH: Ilhéus, PTN: Presidente Tancredo Neves, VAL: Valença, NP: Nilo Peçanha, CAM: Camamu, JAG: Jaguaripe.

SUBFAMILY/ SPECIES	LOCALITIES										
	CAM	IGU	ILH	ITA	JAG	NP	PTN	TAM	UBA	VAL	WG
AMBLYOPONINAE											
Prionopelta antillana Forel, 1909	1	1	1	0	0	1	0	0	0	0	2
Prionopelta sp.1	1	4	1	0	0	0	0	0	0	0	3
DOLICHODERINAE											
Azteca chartifex Forel, 1896	1	0	1	0	0	0	0	0	0	0	2
Azteca paraensis Forel, 1904	0	1	0	0	3	0	0	1	0	0	3
Dolichoderus attelaboides (Fabricius, 1775)	0	4	0	4	1	0	1	0	2	1	0
Dolichoderus bidens (Linnaeus, 1758)	0	0	1	0	1	0	0	0	0	0	0
Dolichoderus bispinosus (Olivier, 1792)	0	0	0	1	0	0	0	0	0	0	0
Dolichoderus diversus Emery, 1894	0	1	0	0	1	0	0	0	0	1	1
Dolichoderus imitator Emery, 1894	5	0	7	0	8	6	9	6	0	6	5
Dolichoderus lutosus (Fr. Smith, 1858)	0	0	2	1	1	0	1	2	0	0	1
Dorymyrmex biconis Forel, 1912	1	5	0	0	0	0	5	0	2	2	4
Dorymyrmex brunneus Forel, 1908	0	0	0	0	3	1	4	2	2	1	4
Dorymyrmex goeldii Forel, 1904	0	0	0	0	2	0	0	0	0	1	1
Dorymyrmex sp.1	0	0	0	0	0	0	0	0	0	0	1
Gracilidris pombero Wild & Cuezzo, 2006	0	0	3	0	5	2	6	0	2	5	4
Linepithema humile (Mayr, 1868)	0	2	0	0	0	0	0	0	3	0	2
Linepithema iniquum (Mayr, 1870)	0	6	0	0	0	0	0	0	0	0	2
Linepithema micans (Forel, 1908)	0	2	0	0	0	0	0	0	1	0	0
Linepithema neotropicum Wild, 2007	0	2	0	0	0	0	0	0	1	0	1
Linepithema sp.1	0	0	0	0	0	0	0	0	2	0	0
Tapinoma melanocephalum (Fabricius, 1793)	0	0	0	0	1	0	2	0	1	3	1
Tapinoma sp.1	0	1	0	0	1	0	1	0	0	0	0
DORYLINAE											
Acanthostichus sp.1	0	1	0	0	0	0	0	0	0	0	0
Cerapachys splendens Borgmeier, 1957	0	1	0	0	0	0	0	0	0	0	0
Cylindromyrmex brevitarsus Santschi, 1925	0	1	0	0	0	0	0	0	0	0	0
Cylindromyrmex striatus Mayr, 1870	0	1	0	0	0	0	1	0	0	0	0
Eciton burchelli (Westwood, 1842)	0	1	0	0	0	0	4	0	1	0	0
Eciton mexicanus (Shuckard, 1840)	0	0	0	2	1	2	0	0	1	0	2
Eciton quadriglume (Haliday, 1836)	0	3	2	0	2	1	1	3	3	1	4
Eciton vagans (Olivier, 1791)	0	0	0	0	1	0	0	0	1	0	1
Labidus coecus (Latreille, 1802)	0	6	4	2	3	0	1	2	2	2	8
Labidus mars (Forel, 1912)	0	1	0	0	0	0	0	0	0	0	0
Labidus praedator (Fr. Smith, 1858)	0	5	0	0	0	0	6	1	2	3	3
Neivamyrmex sp. near *gibbatus*	0	0	1	5	0	0	3	0	1	0	1
Neivamyrmex sp.1	0	0	0	0	1	0	0	0	0	0	0
Neivamyrmex sp.2	0	0	0	0	0	0	1	0	0	0	0
Neivamyrmex sp.3	0	0	0	0	0	0	0	0	0	0	1
Neivamyrmex sp.4	0	1	0	0	0	0	0	0	0	0	0
Neivamyrmex sp.5	0	3	0	0	0	0	0	0	0	0	0
Neivamyrmex sp.6	0	0	0	0	1	0	1	0	1	0	0
Neivamyrmex sp.7	0	2	0	0	0	0	0	0	1	0	0
Nomamyrmex esenbeckii (Westwood, 1842)	1	2	1	0	0	1	0	2	2	1	5
Nomamyrmex hartigii (Westwood, 1842)	0	0	0	0	2	0	0	0	0	1	2
ECTATOMMINAE											
Ectatomma brunneum Fr. Smith, 1858	7	7	6	4	8	5	8	8	7	10	7
Ectatomma edentatum Roger, 1863	4	4	0	0	1	3	3	4	5	2	7
Ectatomma permagnum Forel, 1908	0	0	2	0	0	0	0	7	0	0	1
Ectatomma suzanae Almeida, 1986	1	2	0	10	0	3	1	2	9	2	4
Ectatomma tuberculatum (Olivier, 1791)	13	0	10	0	14	11	10	12	6	14	10
Gnamptogenys acuminata (Emery, 1896)	0	2	3	0	2	0	4	3	0	3	3
Gnamptogenys haenschi (Emery, 1902)	0	2	0	0	0	0	0	0	0	0	4
Gnamptogenys lucaris Kempf, 1968	0	0	0	0	0	0	0	0	1	0	0
Gnamptogenys mediatrix Brown, 1958	0	0	0	0	1	0	1	0	0	0	0
Gnamptogenys menozzi (Borgmeier, 1928)	0	1	3	0	2	0	3	1	0	1	1

Gnamptogenys moelleri (Forel, 1912)	1	0	4	0	5	1	4	8	0	0	0
Gnamptogenys regularis Mayr, 1870	0	2	1	0	0	0	0	1	0	1	0
Gnamptogenys rimulosa (Roger, 1861)	0	3	0	0	3	0	0	0	1	0	3
Gnamptogenys sp.1	0	2	0	0	0	0	0	0	0	0	0
Gnamptogenys striatula Mayr, 1884	0	1	1	0	0	1	1	1	0	0	0
Gnamptogenys sulcata (Fr. Smith, 1858)	0	0	0	0	1	0	1	2	1	2	1
FORMICINAE											
Acropyga decedens (Mayr, 1887)	1	0	0	0	0	0	0	0	0	0	0
Acropyga fuhrmanni (Forel, 1914)	0	0	2	0	4	0	0	3	0	0	0
Acropyga sp.1	0	0	0	0	1	0	0	0	0	0	0
Brachymyrmex admotus Mayr, 1887	1	12	3	1	6	0	8	3	6	0	12
Brachymyrmex heeri Forel, 1874	1	5	1	3	7	0	4	1	5	3	4
Brachymyrmex sp.1	0	0	1	0	1	0	1	0	2	0	0
Brachymyrmex sp.2	0	1	0	0	2	0	0	1	0	0	0
Brachymyrmex sp.3	0	1	0	0	0	0	0	0	0	0	1
Brachymyrmex sp.4	0	1	0	0	1	0	0	2	1	2	1
Brachymyrmex sp.5	0	0	0	0	0	0	0	0	0	0	1
Camponotus (Myrmaphaenus) sp.2	0	0	1	0	0	0	0	0	0	0	0
Camponotus (Myrmaphaenus) sp.5	0	0	0	0	1	0	0	0	0	0	1
Camponotus (Myrmobrachys) sp.6	0	0	1	0	0	1	0	0	0	0	0
Camponotus (Myrmobrachys) sp.7	0	0	0	0	0	0	0	0	0	0	1
Camponotus (Tanaemyrmex) sp.1	0	0	1	0	1	1	0	1	0	0	0
Camponotus (Tanaemyrmex) sp.3	1	6	0	0	2	0	0	0	8	2	5
Camponotus (Tanaemyrmex) sp.4	0	0	0	0	0	0	0	0	1	0	0
Camponotus (Tanaemyrmex) sp.5	0	0	1	0	0	0	0	0	0	0	0
Camponotus apicalis (Mann, 1916)	0	0	0	0	0	0	1	0	0	0	0
*Camponotus atriceps*_F1	0	2	1	2	1	0	0	0	2	1	3
*Camponotus atriceps*_F2	0	0	5	0	5	1	1	2	6	2	1
Camponotus bidens Mayr, 1870	0	0	0	1	0	0	1	0	0	0	0
Camponotus blandus (Fr. Smith, 1858)	1	0	0	6	2	1	5	2	4	1	3
Camponotus cingulatus Mayr, 1862	3	6	1	3	6	2	2	0	8	2	2
Camponotus crassus Mayr, 1862	4	6	2	0	5	3	4	1	1	3	3
Camponotus egregius (Fr. Smith, 1858)	0	0	0	0	1	1	0	0	1	0	2
Camponotus fastigatus Roger, 1863	0	1	0	1	1	1	3	1	3	1	4
Camponotus latangulus Roger, 1863	0	0	0	0	3	0	1	0	0	1	0
Camponotus lespesii Forel, 1886	1	1	0	0	2	1	0	0	1	2	0
Camponotus leydigi Forel, 1886	0	3	3	0	4	1	7	1	5	6	6
Camponotus melanoticus Emery, 1894	0	7	1	0	0	0	0	0	0	2	0
Camponotus nidulans (Fr. Smith, 1860)	0	0	0	0	0	0	0	0	1	0	0
Camponotus novogranadensis Mayr, 1870	4	5	7	3	4	3	9	2	8	9	7
Camponotus punctulatus andigenus Emery, 1903	0	4	1	0	0	0	0	0	0	0	2
Camponotus rectangularis Emery, 1890	0	0	1	0	5	1	2	0	0	0	0
Camponotus rufipes (Mayr, 1775)	0	4	0	3	4	0	0	1	0	0	0
Camponotus sexguttatus (Fabricius, 1793)	0	0	1	0	0	0	0	0	0	0	0
Camponotus trapezoideus Mayr, 1870	0	0	0	0	0	0	0	0	0	0	1
Camponotus vittatus Forel, 1904	3	4	4	7	5	5	2	5	7	6	6
Nylanderia fulva (Mayr, 1862)	3	5	10	0	10	1	2	4	3	0	9
Nylanderia guatemalensis (Forel, 1885)	0	8	3	0	6	3	4	4	8	3	7
Nylanderia sp.1	2	3	0	0	0	1	0	1	3	0	0
Nylanderia sp.2	1	0	2	0	1	0	1	0	2	0	3
Nylanderia sp.3	0	3	0	0	1	0	1	0	1	0	1
Nylanderia sp.4	0	1	0	0	0	0	0	0	0	0	1
Nylanderia sp.5	0	0	3	0	1	0	0	1	0	1	0
Nylanderia sp.6	0	1	0	0	0	0	0	0	0	0	1
Nylanderia sp.7	0	1	0	0	0	0	0	0	0	0	0
Paratrechina longicornis (Latreille, 1802)	0	0	0	2	2	0	1	1	0	1	0
HETEROPONERINAE											
Acanthoponera mucronata (Roger, 1860)	0	2	0	0	0	0	0	0	0	0	0
Acanthoponera sp.1	0	1	0	3	0	0	0	0	0	0	0
Heteroponera angulata Borgmeier, 1959	0	2	0	0	0	0	0	0	0	0	0
Heteroponera mayri Kempf, 1962	0	6	0	0	0	0	0	1	1	0	0
MYRMICINAE											
Acanthognathus ocellatus Mayr, 1887	0	1	0	0	0	0	0	0	4	0	0
Acromyrmex aspersus (Fr. Smith, 1858)	0	0	0	0	0	0	0	0	0	0	2
Acromyrmex balzani (Emery, 1890)	3	3	6	5	5	5	7	5	4	6	9
Acromyrmex coronatus (Fabricius, 1804)	0	0	0	1	0	0	1	0	1	1	3
Acromyrmex rugosus (Fr. Smith, 1858)	2	1	1	2	1	2	3	3	2	5	2
Acromyrmex subterraneus brunneus (Forel, 1912)	0	5	0	6	2	0	4	3	8	0	1
Acromyrmex subterraneus subterraneus (Forel, 1893)	0	1	0	0	0	0	1	0	0	1	1
Apterostigma acre Lattke, 1997	0	2	1	0	2	0	0	0	3	1	1
Apterostigma auriculatum Wheeler, 1925	0	1	0	0	0	0	0	0	1	0	2
Apterostigma group *Pilosum* sp.1	0	0	2	0	1	0	4	3	0	0	0
Apterostigma group *Pilosum* sp.2	0	0	0	0	0	1	0	0	0	1	0

Apterostigma group *Pilosum* sp.3	0	1	0	0	0	0	0	0	0	0	0
Apterostigma ierense Weber, 1937	0	0	1	0	1	1	0	0	0	0	0
Apterostigma near *epinotale*	0	2	0	0	0	1	0	1	0	0	1
Apterostigma near *spiculum*	0	2	3	0	3	1	1	2	0	0	1
Apterostigma urichii Forel, 1893	0	0	0	0	3	0	3	0	2	0	2
Atta cephalotes (Linnaeus, 1758)	3	0	4	0	1	1	0	0	0	1	2
Atta laevigata (Fr. Smith, 1858)	0	0	0	0	1	1	0	0	1	0	1
Atta sexdens (Linnaeus, 1758)	0	3	0	0	8	3	5	8	3	4	5
Basiceros disciger (Mayr, 1887)	0	2	0	0	0	0	0	0	0	0	0
Blepharidatta delabiei Brandão, Feitosa & Diniz, 2015	0	0	1	0	3	0	0	0	3	0	0
Cardiocondyla minutior Forel, 1899	0	0	1	0	0	0	0	0	0	0	0
Cardiocondyla obscurior Wheeler, 1929	0	0	0	1	0	0	0	2	0	0	0
Carebara sp.1	0	1	0	0	0	0	0	1	1	0	0
Carebara sp.2	0	1	0	0	0	0	0	0	0	0	0
Carebara sp.3	0	0	0	0	0	0	1	0	0	0	0
Carebara urichi (Wheeler, 1922)	0	1	0	0	0	0	0	1	0	0	2
Cephalotes atratus (Linnaeus, 1758)	0	1	2	3	2	1	3	3	3	2	2
Cephalotes goeldii (Forel, 1912)	0	0	0	1	0	0	0	0	0	0	0
Cephalotes minutus (Fabricius, 1804)	0	0	0	1	1	0	1	0	0	0	0
Cephalotes pallidus De Andrade, 1999	0	0	0	0	0	0	0	0	0	0	1
Cephalotes pavonii (Latreille, 1809)	0	0	0	1	0	0	1	0	0	0	0
Cephalotes pinelii (Guérin-Méneville, 1844)	0	0	1	0	0	0	1	0	0	0	0
Cephalotes pusillus (Klug, 1824)	0	0	0	1	0	0	1	0	0	0	0
Cephalotes umbraculatus (Fabricius, 1804)	0	0	1	0	0	0	0	0	0	0	0
Crematogaster abstinens Forel, 1899	1	7	5	3	6	0	0	1	1	1	2
Crematogaster acuta (Fabricius, 1804)	0	0	0	4	0	0	0	0	0	0	2
Crematogaster carinata Mayr, 1862	0	0	2	2	1	0	0	0	0	0	1
Crematogaster crinosa Mayr, 1862	1	2	3	1	6	0	3	0	0	1	4
Crematogaster curvispinosa Mayr, 1862	1	1	1	0	1	0	2	0	1	0	0
Crematogaster erecta Mayr, 1866	0	0	1	0	0	0	1	0	0	0	0
Crematogaster evallans Forel, 1907	0	1	3	3	0	0	3	2	3	1	8
Crematogaster limata Fr. Smith, 1858	1	0	5	1	7	1	8	2	0	2	5
Crematogaster nigropilosa Mayr, 1870	0	1	0	0	2	0	1	0	1	0	6
Crematogaster sotobosque Longino, 2003	0	4	1	0	0	0	0	0	0	0	2
Crematogaster sp.1	0	2	0	0	0	0	0	0	0	0	0
Crematogaster sp.2	0	1	0	0	1	0	0	0	0	0	0
Crematogaster sp.3	0	0	0	0	0	0	0	0	1	0	0
Crematogaster tenuicula Forel, 1904	0	0	1	0	2	0	3	0	1	1	2
Cyphomyrmex cornutus Kempf, 1968	0	0	0	0	0	0	0	0	0	1	0
Cyphomyrmex group *Rimosus* sp.1	0	2	4	0	0	1	0	0	1	0	0
Cyphomyrmex major Forel, 1901	1	7	1	1	4	0	7	2	3	2	1
Cyphomyrmex minutus Mayr, 1862	0	9	2	5	8	2	7	3	4	4	6
Cyphomyrmex peltatus Kempf, 1966	0	0	0	0	1	0	0	0	0	0	0
Cyphomyrmex rimosus (Spinola, 1853)	0	5	7	1	1	2	3	2	6	0	4
Cyphomyrmex salvini Forel, 1899	0	0	0	0	0	0	0	0	1	0	0
Cyphomyrmex transversus Emery, 1894	0	0	0	1	1	0	1	1	1	0	1
Hylomyrma balzani (Emery, 1894)	0	6	0	2	0	0	0	1	1	0	0
Hylomyrma immanis Kempf, 1973	1	0	2	0	7	2	3	3	0	2	1
Hylomyrma sagax Kempf, 1973	0	0	0	0	1	0	0	1	0	0	0
Megalomyrmex ayri Brandão, 1990	0	0	0	0	1	0	1	0	0	0	0
Megalomyrmex goeldii Forel, 1912	3	2	1	0	6	1	4	0	0	3	0
Megalomyrmex silvestrii Wheeler, 1909	0	0	1	1	2	0	1	0	1	0	0
Megalomyrmex sp.1	0	0	0	0	0	1	1	0	0	0	2
Megalomyrmex sp.2	0	0	0	0	0	0	1	0	0	0	1
Megalomyrmex sp.3	0	0	0	0	0	0	0	1	0	0	0
Monomorium floricola (Jerdon, 1851)	1	5	0	0	0	0	0	1	1	0	1
Mycetarotes parallelus (Emery, 1906)	0	0	0	0	2	0	0	0	1	1	0
Mycetophylax morschi (Emery, 1888)	0	0	0	0	1	0	0	0	0	0	0
Mycocepurus goeldii Forel, 1893	1	2	6	2	7	0	5	4	3	0	3
Myrmelachista sp.1	0	0	0	0	0	0	0	0	1	0	1
Myrmelachista sp.2	0	0	1	0	0	0	0	0	0	0	0
Myrmicocrypta sp.1	0	0	0	0	2	0	2	2	0	0	1
Myrmicocrypta sp.2	0	0	0	0	0	0	2	0	0	0	0
Nesomyrmex spininodis (Mayr, 1887)	0	0	0	0	0	0	1	0	0	0	0
Nesomyrmex tristani (Emery, 1896)	0	0	0	0	1	0	1	0	0	0	0
Ochetomyrmex neopolitus Fernández, 2003	0	1	0	0	0	0	0	0	0	1	2
Octostruma balzani (Emery, 1894)	5	1	5	0	1	3	4	1	5	3	0
Octostruma jheringi (Emery, 1888)	1	1	0	0	0	0	0	0	0	0	0
Octostruma rugifera (Mayr, 1887)	0	1	1	3	0	0	0	1	0	0	0
Octostruma sp.1	0	0	0	0	0	0	0	0	0	0	1
Octostruma stenognatha Brown & Kempf, 1960	0	1	0	0	0	0	0	0	4	0	0
Oxyepoecus browni Alburquerque & Brandão, 2004	0	0	0	1	0	0	0	0	0	0	0
Pheidole diligens (Fr. Smith, 1858)	1	5	4	6	2	3	5	2	6	5	7

Pheidole fallax Mayr, 1870	0	0	2	0	0	1	1	0	0	0	0
Pheidole fimbriata Roger, 1863	0	0	0	0	0	0	5	1	0	2	0
Pheidole flavens Roger, 1863	5	8	6	6	9	6	6	4	6	6	5
Pheidole gertrudae Forel, 1886	0	6	0	0	0	0	0	0	5	0	0
Pheidole group *Diligens* sp.10	0	0	0	0	0	0	1	0	0	0	0
Pheidole group *Diligens* sp.15	0	1	0	0	0	0	0	0	0	0	0
Pheidole group *Diligens* sp.19	0	1	0	0	0	0	0	0	2	0	3
Pheidole group *Diligens* sp.22	0	3	2	2	2	0	2	0	2	0	2
Pheidole group *Diligens* sp.34	1	4	1	2	0	1	0	0	3	0	3
Pheidole group *Diligens* sp.35	0	1	1	2	0	1	0	0	1	0	0
Pheidole group *Diligens* sp.37	0	1	0	1	1	0	1	0	0	0	0
Pheidole group *Fallax* sp.2	0	0	2	0	4	0	1	0	1	1	1
Pheidole group *Fallax* sp.21	0	4	0	1	0	0	0	1	0	0	0
Pheidole group *Fallax* sp.23	0	2	0	1	3	0	2	1	0	1	0
Pheidole group *Fallax* sp.25	0	0	0	0	2	0	0	0	3	0	4
Pheidole group *Fallax* sp.26	0	2	1	0	4	1	7	0	0	1	3
Pheidole group *Fallax* sp.28	0	0	0	2	1	0	0	0	0	0	0
Pheidole group *Fallax* sp.36	0	0	0	0	0	0	0	0	1	0	0
Pheidole group *Flavens* sp.1	2	2	4	0	1	0	0	0	1	0	1
Pheidole group *Flavens* sp.2	0	1	0	0	0	0	0	0	1	0	0
Pheidole group *Flavens* sp.3	0	1	1	0	1	0	0	0	0	0	1
Pheidole group *Flavens* sp.5	0	5	0	0	1	0	0	0	0	0	1
Pheidole group *Flavens* sp.7	1	0	0	0	0	0	0	0	0	0	1
Pheidole group *Tristis* sp.4	0	0	0	0	1	0	0	1	0	0	0
Pheidole group *Tristis* sp.6	0	3	0	0	0	0	0	0	0	0	1
Pheidole group *Tristis* sp.8	0	0	1	2	0	0	0	0	0	0	0
Pheidole group *Tristis* sp.9	0	6	0	2	5	0	3	4	2	0	2
Pheidole group *Tristis* sp.11	0	0	0	0	0	0	0	0	2	1	0
Pheidole group *Tristis* sp.12	0	0	0	0	0	0	0	0	1	0	0
Pheidole group *Tristis* sp.13	3	0	1	0	2	0	1	0	0	0	0
Pheidole group *Tristis* sp.14	0	0	0	0	0	0	1	0	2	0	0
Pheidole group *Tristis* sp.16	0	3	0	0	0	0	0	0	3	0	0
Pheidole group *Tristis* sp.17	0	4	0	0	0	0	0	0	0	0	0
Pheidole group *Tristis* sp.18	0	1	0	0	0	0	0	0	0	0	0
Pheidole group *Tristis* sp.24	0	0	0	0	0	0	1	0	0	0	0
Pheidole group *Tristis* sp.27	0	0	1	0	1	0	0	0	0	0	0
Pheidole group *Tristis* sp.29	0	0	0	0	0	0	0	0	1	0	0
Pheidole group *Tristis* sp.30	0	0	0	0	0	0	0	0	1	0	0
Pheidole group *Tristis* sp.31	0	0	0	0	1	0	0	0	1	0	0
Pheidole group *Tristis* sp.32	0	1	0	0	0	0	0	0	0	0	0
Pheidole group *Tristis* sp.33	0	1	0	0	0	0	0	0	0	0	0
Pheidole group *Tristis* sp.37	0	0	0	1	0	0	2	0	0	1	0
Pheidole group *Tristis* sp.38	0	1	0	0	0	0	0	0	0	0	0
Pheidole group *Tristis* sp.39	0	1	1	0	1	0	0	0	0	0	0
Pheidole group *Tristis* sp.40	0	0	0	0	0	0	0	0	1	0	0
Pheidole jelskii Mayr, 1884	0	1	0	0	0	1	0	1	0	0	0
Pheidole midas Wilson, 2003	1	1	5	5	3	0	9	7	2	0	2
Pheidole nitella Wilson, 2003	1	3	3	1	4	1	6	5	4	3	7
Pheidole obscurithorax Naves, 1985	1	10	5	8	9	3	12	7	7	8	9
Pheidole obtusopilosa Mayr, 1887	2	8	4	2	3	2	6	1	7	2	4
Pheidole near *fimbriata*	0	5	4	3	3	1	5	0	1	2	3
Pheidole near *grandinosus*	0	7	0	0	3	0	8	5	2	1	3
Pheidole near *lancifera*	0	4	0	0	0	0	0	0	3	0	3
Pheidole near *sospes*	0	3	0	0	0	0	0	1	1	0	0
Pheidole near *subarmata*	0	1	0	0	0	0	0	0	0	0	0
Pheidole near *subspherica*	2	0	0	0	0	0	0	0	0	0	0
Pheidole near *vafra*	5	6	4	6	8	2	7	6	5	2	7
Pheidole radoszkowskii Mayr, 1884	6	13	9	7	13	2	14	10	9	5	12
Pheidole synamarta Latreille, 1809	0	4	1	0	6	0	7	3	2	2	5
Pheidole tetrica Forel, 1913	2	6	3	0	2	0	0	0	1	4	0
Pheidole tijucana Borgmeier, 1927	2	3	2	0	0	1	0	0	3	0	3
Pheidole vallifica Forel, 1901	0	0	0	0	0	0	1	1	0	0	1
Pheidole venatrix Wilson, 2003	1	6	0	2	0	0	1	1	5	2	1
Pogonomyrmex naegelii Forel, 1878	0	6	1	3	0	4	4	4	4	2	5
Procryptocerus adlerzi (Mayr, 1887)	0	1	0	0	0	0	0	0	0	0	3
Procryptocerus convergens (Mayr, 1887)	0	1	0	0	0	0	0	0	0	0	0
Procryptocerus goeldii Forel, 1899	0	0	0	0	0	0	0	0	0	0	2
Procryptocerus hirsutus Emery, 1896	0	1	0	0	0	0	0	0	0	0	0
Procryptocerus hylaeus Kempf, 1951	0	0	1	0	0	0	0	1	0	1	0
Procryptocerus sp.1	0	0	0	0	0	0	0	0	1	0	0
Procryptocerus spiniperdus Forel, 1899	0	1	0	0	0	0	0	0	0	0	1
Rogeria alzatei Kugler, 1994	0	0	0	1	0	0	0	0	0	0	0
Rogeria besucheti Kugler, 1994	0	1	0	0	1	0	0	1	0	0	0
Rogeria lirata Kugler, 1994	0	0	0	0	0	0	0	1	0	0	0

Rogeria subarmata (Kempf, 1961)	0	0	0	0	3	0	2	0	0	0	3
Sericomyrmex sp.1	5	5	5	0	7	8	6	5	4	5	7
Sericomyrmex sp.2	4	1	5	0	7	4	5	4	0	5	5
Sericomyrmex sp.3	2	0	2	0	1	0	5	1	0	2	5
Sericomyrmex sp.4	0	0	2	0	2	1	5	3	0	1	4
Solenopsis geminata (Fabricius, 1804)	2	8	5	7	13	2	5	2	5	3	5
Solenopsis globularia (Fr. Smith, 1858)	0	0	0	0	2	1	0	0	1	0	0
Solenopsis saevissima (Fr. Smith, 1855)	0	3	0	1	4	1	1	0	4	1	3
Solenopsis sp.1	0	0	0	0	1	0	0	0	0	0	1
Solenopsis sp.2	1	2	0	0	0	0	1	0	0	0	1
Solenopsis sp.3	0	0	0	0	0	1	0	0	0	0	0
Solenopsis sp.4	0	7	0	1	0	2	1	1	3	0	3
Solenopsis sp.5	0	6	2	1	5	0	2	1	3	4	2
Solenopsis sp.6	2	8	9	2	8	2	3	5	7	4	10
Solenopsis sp.7	0	10	4	1	4	4	3	1	7	4	7
Solenopsis virulens (Fr. Smith, 1858)	0	3	1	0	3	1	0	2	4	0	6
Stegomyrmex olindae Feitosa, Brandão & Diniz, 2008	0	0	0	2	0	0	0	0	0	0	0
Strumigenys appretiata (Borgmeier, 1954)	0	1	0	0	0	0	0	0	0	0	0
Strumigenys denticulata Mayr, 1887	8	7	7	2	7	6	9	4	9	6	7
Strumigenys eggersi Emery, 1890	1	7	0	0	3	2	0	1	5	1	4
Strumigenys elongata Roger, 1863	0	1	0	0	0	0	0	0	0	0	0
Strumigenys epinotalis Weber, 1934	0	6	0	0	0	0	0	1	2	3	7
Strumigenys precava Brown, 1954	0	5	2	0	6	0	4	3	2	3	3
Strumigenys rugithorax (Kempf, 1959)	0	0	0	0	0	1	1	0	0	0	1
Strumigenys smithii Forel, 1886	0	0	1	0	0	0	0	0	0	0	0
Strumigenys sp.1	0	1	0	0	0	0	0	0	0	0	0
Strumigenys sp.2	0	2	0	0	0	1	0	0	0	0	1
Strumigenys sp.3	0	1	0	0	0	0	0	0	0	0	0
Strumigenys sp.4	0	0	0	0	0	0	0	0	1	0	0
Strumigenys sp.5	0	0	0	1	0	0	0	0	0	0	0
Strumigenys sp.6	0	1	0	0	0	0	0	0	0	0	0
Strumigenys sp.7	0	0	0	0	0	0	0	1	1	0	0
Strumigenys stenotes (Bolton, 2000)	0	3	1	0	3	0	1	0	0	0	1
Strumigenys trinidadensis Wheeler, 1922	0	0	1	0	0	0	0	0	2	0	2
Tetramorium bicarinatum (Nylander, 1846)	2	0	0	0	2	0	0	8	0	0	0
Tetramorium simillimun (Fr. Smith, 1851)	0	0	1	0	0	0	0	0	0	0	0
Trachymyrmex cornetzi (Forel, 1912)	0	0	0	0	8	0	4	0	0	1	1
*Trachymyrmex fuscus*Emery, 1894	1	0	0	0	5	3	4	0	0	1	1
Trachymyrmex relictus Borgmeier, 1934	1	0	1	1	7	0	2	2	0	2	0
Trachymyrmex sp.1	0	0	0	0	1	0	0	0	0	0	0
Trachymyrmex sp.2	2	0	0	0	1	2	0	0	0	0	0
Trachymyrmex sp.3	0	0	0	2	1	0	0	0	0	1	0
Tranopelta gilva Mayr, 1866	0	0	0	0	0	0	0	0	0	0	2
Wasmannia auropunctata (Roger, 1863)	3	4	13	7	6	4	8	7	7	6	7
Wasmannia lutzi Forel, 1908	0	4	2	1	1	0	1	1	0	0	2
Wasmannia rochai Forel, 1912	0	0	2	0	0	0	0	0	0	0	1
Wasmannia sp.1	0	0	0	1	0	0	0	0	0	0	0
PONERINAE											
Anochetus diegensis Forel, 1912	0	0	0	0	0	0	1	0	0	0	0
Anochetus inermis André, 1889	0	0	0	0	0	0	0	0	0	1	0
Anochetus mayri Emery, 1884	0	0	1	1	3	0	3	3	1	0	2
Anochetus simoni Emery, 1890	0	6	1	0	2	2	1	1	3	0	6
Centromyrmex alfaroi Emery, 1890	0	0	0	0	0	0	0	0	0	1	0
Cryptopone holmgreni (Wheeler, 1925)	0	4	0	0	2	0	0	0	2	0	1
Dinoponera lucida Emery, 1901	0	0	0	0	0	0	0	6	0	0	0
Hypoponera foreli (Mayr, 1887)	2	3	1	0	1	1	0	1	4	1	3
Hypoponera opaciceps (Mayr, 1887)	0	0	3	0	2	0	0	1	2	0	1
Hypoponera sp.1	1	8	3	4	2	2	1	2	6	2	3
Hypoponera sp.2	0	4	0	0	0	0	0	0	1	0	0
Hypoponera sp.3	0	2	0	0	0	0	0	1	0	0	0
Hypoponera sp.4	1	4	1	0	1	0	0	0	1	0	0
Hypoponera sp.5	0	4	0	0	2	0	0	0	0	1	4
Hypoponera sp.6	0	0	0	0	2	0	1	1	0	1	1
Hypoponera sp.7	1	2	1	0	1	2	0	1	1	3	0
Hypoponera sp.8	0	3	0	0	0	0	0	0	1	0	2
Hypoponera sp.9	0	1	0	0	1	0	1	0	0	0	0
Hypoponera sp.10	0	0	0	0	0	0	1	0	0	0	0
Hypoponera sp.11	0	0	0	0	0	0	0	1	0	0	0
Hypoponera sp.12	0	4	0	0	0	0	0	0	0	1	3
Leptogenys arcuata Roger, 1861	0	0	3	0	0	0	1	0	0	0	0
Leptogenys corniculans Lattke, 2011	0	3	0	0	0	0	1	2	2	0	4
Leptogenys group *Luederwaldti* sp.1	0	2	0	0	0	0	0	0	3	0	1
Leptogenys unistimulosa Roger, 1863	0	0	0	0	10	0	4	0	7	5	0
Mayaponera constricta Mayr, 1884	3	2	7	0	9	4	8	6	0	4	0

Neoponera apicalis (Latreille, 1802)	2	9	4	2	8	3	2	5	6	2	3
Neoponera bucki (Borgmeier, 1927)	1	1	0	0	0	0	2	6	1	1	4
Neoponera carinulata (Roger, 1861)	0	4	0	0	0	0	0	0	1	0	1
Neoponera cavinodis Mann, 1916	1	0	0	0	0	0	0	0	0	1	0
Neoponera concava (Mackay & Mackay, 2010)	5	3	6	5	3	6	1	3	2	3	5
Neoponera crenata (Roger, 1861)	0	1	0	0	0	0	0	0	0	0	0
Neoponera curvinodis (Forel, 1899)	0	3	0	3	1	0	0	2	0	0	1
Neoponera inversa (Fr. Smith, 1858)	1	0	0	0	0	1	0	0	0	0	0
Neoponera latinoda (Mackay & Mackay, 2010)	0	0	0	0	0	0	0	2	0	0	0
Neoponera marginata (Roger, 1861)	0	1	0	0	0	0	0	1	2	0	0
Neoponera schultzi (Mackay & Mackay, 2010)	0	1	0	0	0	0	0	0	2	1	0
Neoponera striatinodis (Emery, 1890)	0	0	0	0	0	0	0	1	0	0	3
Neoponera unidentata (Mayr, 1862)	0	0	0	0	1	0	0	1	0	0	0
Neoponera venusta Forel, 1912	0	0	0	0	0	0	0	7	0	0	1
Neoponera verenae (Forel, 1922)	0	1	1	0	1	0	3	2	0	2	3
Neoponera villosa (Fabricius, 1804)	0	0	4	1	0	0	0	0	0	1	0
Odontomachus bauri Emery, 1892	0	6	3	4	0	0	0	3	0	0	0
Odontomachus biumbonatus Brown, 1976	2	3	0	0	3	0	0	3	2	1	3
Odontomachus brunneus (Patton, 1894)	1	1	1	0	7	2	6	1	5	6	5
Odontomachus chelifer (Latreille, 1802)	0	10	0	0	0	0	0	2	5	0	1
Odontomachus haematodus (Linnaeus, 1758)	8	7	9	7	12	9	9	10	9	13	11
Odontomachus hastatus (Fabricius, 1804)	0	1	0	1	0	0	0	0	2	0	2
Odontomachus meinerti Forel, 1905	4	7	7	0	8	6	9	8	6	8	8
Odontomachus affinis *mormo* Guerih-Méneville, 1844	0	7	0	0	0	0	0	0	0	0	1
Pachycondyla crassinoda (Latreille, 1802)	2	2	7	0	9	8	4	0	0	6	1
Pachycondyla harpax (Fabricius, 1804)	1	11	6	0	9	2	7	9	11	8	7
Pachycondyla impressa (Roger, 1861)	2	2	1	0	1	1	2	3	1	3	0
Pachycondyla magnifica Borgmeier, 1929	0	1	0	0	2	0	0	0	2	2	0
Pachycondyla metanotalis Luederwaldt, 1918	0	0	0	0	0	0	0	0	1	0	0
Pachycondyla sp. near *harpax*	0	0	0	0	1	0	0	0	1	0	0
Pachycondyla sp. near *striata*	0	5	0	0	0	0	0	0	4	0	1
Pachycondyla striata Fr. Smith, 1858	3	13	0	0	0	0	0	0	6	0	9
Rasopone arhuaca (Forel, 1901)	1	2	2	0	3	1	0	0	4	0	5
Rasopone ferruginea (Fr. Smith, 1858)	0	0	0	0	1	0	1	0	0	0	0
Rasopone gilberti (Kempf, 1960)	0	2	2	1	2	0	0	0	0	2	0
Rasopone sp. near *arhuaca*	0	4	0	0	0	0	0	0	0	0	0
Rasopone stigma (Fabricius, 1804)	0	0	0	0	0	0	1	1	0	0	0
Thaumatomyrmex mutilatus Mayr, 1887	0	0	0	0	0	0	0	0	1	0	0
Thaumatomyrmex sp.1	0	0	0	1	0	0	0	0	0	0	0
PSEUDOMYRMECINAE											
Pseudomyrmex group *Pallidus* sp.1	0	0	0	0	0	0	0	0	0	0	1
Pseudomyrmex group *Pallidus* sp.2	0	0	1	0	1	0	0	0	0	0	0
Pseudomyrmex group *Pallidus* sp.3	0	0	0	0	1	0	1	0	0	1	3
Pseudomyrmex gracilis (Fabricius, 1804)	1	1	1	0	0	0	0	0	3	2	1
Pseudomyrmex oculatus (Fr. Smith, 1855)	0	0	0	0	0	0	3	0	0	0	1
Pseudomyrmex schuppi (Forel, 1901)	0	0	0	1	0	0	2	0	1	0	0
Pseudomyrmex simplex (Fr. Smith, 1877)	0	0	0	0	0	0	1	0	0	0	0
Pseudomyrmex tenuis (Fabricius, 1804)	0	0	1	3	8	0	10	2	2	3	2
Pseudomyrmex termitarius (Fr. Smith, 1855)	2	4	4	4	8	5	8	4	4	6	8
Number of occurrences	**202**	**696**	**404**	**251**	**612**	**226**	**532**	**390**	**514**	**353**	**618**

The localities of the Atlantic Forest with higher species richness of ants were Iguaí (212 spp.), Wenceslau Guimarães (199 spp.) and Jaguaripe (184 spp.), while a lowest richness was observed in Itapetinga (95 spp.), Nilo Peçanha (96 spp.) and Camamu (88 spp.). Among all the species recorded, 21 were common to all sampled Atlantic Forest localities (Table 2). The commonest species found in this study were *Odontomachus haematodus* Linnaeus, 1758, *Pheidole radoszkowskii* Mayr, 1884, *Ectatomma tuberculatum* (Olivier, 1791), *Odontomachus meinerti* Forel, 1905, *Pheidole obscurithorax* Naves, 1985, *Wasmannia auropunctata* (Roger, 1863), *Ectatomma brunneum* Fr. Smith, 1858, *Pheidole flavens* Roger, 1863, *Strumigenys denticulata* Mayr, 1887 and *Pachycondyla harpax* (Fabricius, 1804) (Fig. 2).

The number of exclusive species per studied sites varied from one to 30 (Table 3). The localities with the higher numbers of exclusive species were Iguaí (30 spp.), Ubaíra (15 spp.) and Wenceslau Guimarães (11 spp.), while the localities with the lower number were:

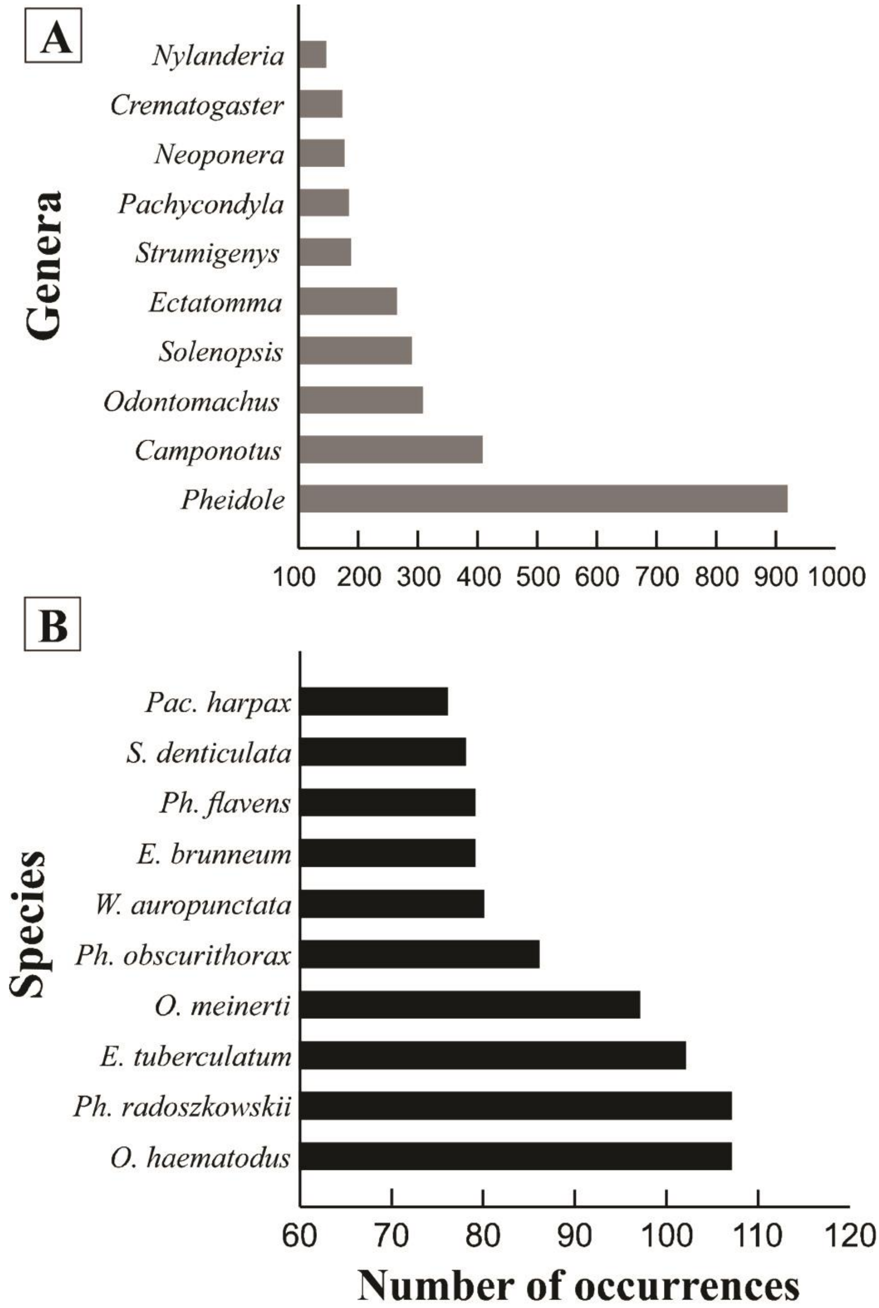

Figure 2. The most abundant ant genera (**A**) and most abundant species (**B**) collected in Atlantic Forest remnants in the state of Bahia, Brazil, 2011-2012.

Nilo Peçanha (one spp.), Camamu (two spp.) and Valença (three spp.) (Table 3). Among all species, 98 (about 25% of the total) were recorded each one in a single locality only. Among these, *Dinoponera lucida* Emery, 1901 was the one that occurred in the larger number of samples (six at Itamarajú). Other exclusive species that deserve a special mention because of their relative rarity are: *Acanthoponera mucronata* (Roger, 1860), *Basiceros disciger* (Mayr, 1887), *Centromyrmex alfaroi* Emery, 1890, *Cerapachys splendens* Borgmeier, 1957, *Heteroponera angulata* Borgmeier, 1959, *Oxyepoecus browni* Alburquerque & Brandão, 2004, *Stegomyrmex olindae* Feitosa, Brandão & Diniz, 2008, *Thaumatomyrmex mutilatus* Mayr, 1887 and *Tranopelta gilva* Mayr, 1866 (see Table 2 for details).

Among all the records of ants, 147 morphospecies remained unidentified (Table 2), that is, about 38% of occurrences. The accumulation curve does not reach a plateau and is still in the growing phase although the sampling effort which was done (Fig. 3). The Chao1 index presented an amount of 462 expected species.

Table 3. Summary of the number of subfamilies, genera, richness and number of exclusive ant species, collected with pitfall and winkler traps in 11 landscapes distributed in the Atlantic Forest biome in the state of Bahia, Brazil.

Locality/Code	Total number of subfamilies	Total number of genera	Ant richness	Number of exclusive species
Camamu (CAM)	8	34	88	2
Iguaí (IGU)	9	53	212	30
Ilhéus (ILH)	8	45	145	8
Itapetinga (ITA)	8	34	95	7
Jaguaripe (JAG)	7	49	184	5
Nilo Peçanha (NP)	8	34	96	1
Presidente Tancredo Neves (PTN)	7	44	161	10
Itamarajú (TAM)	8	48	141	5
Ubaíra (UBA)	8	48	175	15
Valença (VAL)	7	43	134	3
Wenceslau Guimarães (WG)	8	50	199	11

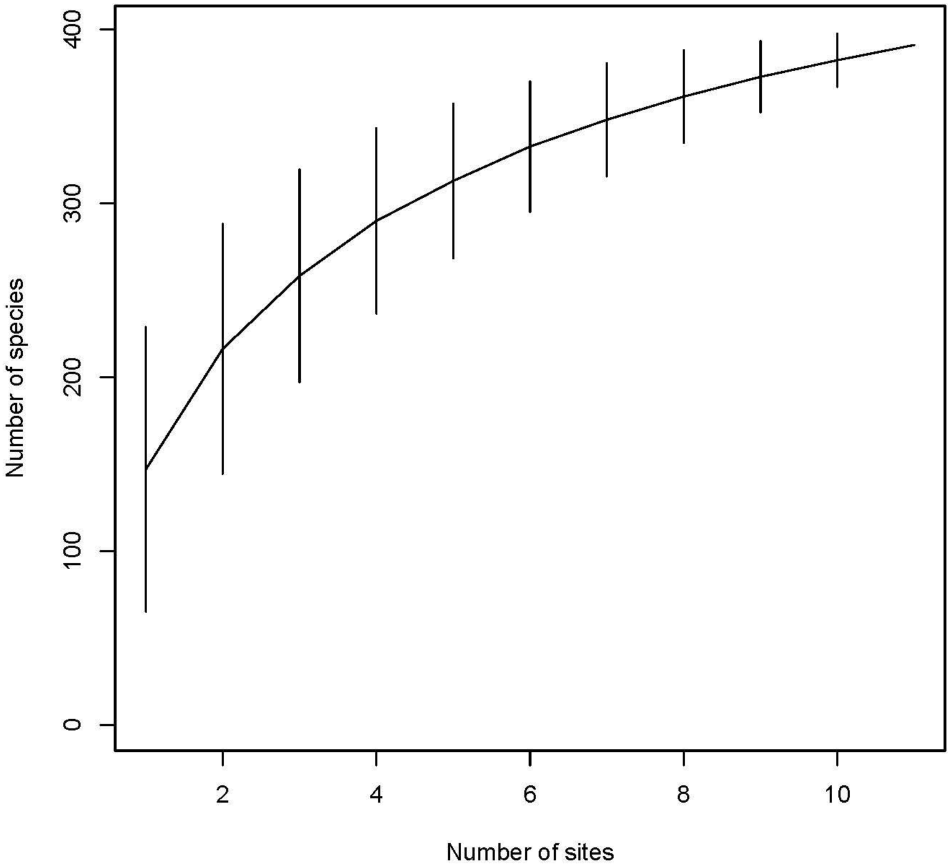

Figure 3. Species accumulation curve of ants collected in Atlantic Forest remnants in the state of Bahia, Brazil, 2011-2012.

Discussion

In a recent study using Winkler traps, Silva & Brandão (2014) found a considerable diversity for the family Formicidae in the Brazilian Atlantic Forest, with 530 ant species. The geographic coverage of their study was much larger than our, since the sampling sites were distributed over a latitude gradient up to 20°, all over the biome (about 3,400 km, following an approximate northeast-southwest axe). Nevertheless, our study, carried out along 1,000 km of the Atlantic Forest, represents one of the most intensive ant inventories conducted in a single state of the Brazilian Federation. The impressive amount of unidentified species (about one-third of the whole sampling) let suppose at first sight that there is a large amount of undescribed ant species in the region. The number of new taxa is yet expected to be much smaller as many genera are in fact waiting for a comprehensive revision (*Brachymyrmex*, *Camponotus*, *Hypoponera*, *Myrmicocrypta*, *Nylanderia* and *Solenopsis*, for example), for regional keys (*Crematogaster*, *Myrmelachista*, *Strumigenys* and *Trachymyrmex*, for example) and for which an exhaustive sampling is lacking (*Pheidole*, for example, where identification is easier when *minor* and *major* workers are both available).

In our study, the prevalent subfamilies Myrmicinae, Formicinae and Ponerinae are also the richest in species and genera as it commonly happens in ant inventories in the whole Neotropical Region (Kempf 1972b; Baccaro *et al.* 2015; Fernandez 2003). As usual (Santos *et al.* 2006; Gomes *et al.* 2010), Myrmicinae stands out among the other subfamilies for its richness in number of species. Taxa of this subfamily present a variety of behavioral, morphological and ecological adaptations that enable their representatives to explore more efficiently any kind of resources (Hölldobler & Wilson 1990; Fowler *et al.* 1991; Ward 2010).

The Ponerinae and Formicinae subfamilies presented also a large number of species, a pattern that is common with other studies on ant communities in the Atlantic Forest biome (Delabie *et al.* 1999; Santos *et al.* 2006; Suguituru 2013). Most of Ponerinae are forest specialists and can be very abundant and diverse in tropical and subtropical regions; the Ponerinae appears as the second subfamily if we rank the species number per subfamily in conserved forests or agroforestry (Delabie *et al.* 1999). For this and other reasons, these ants are frequently considered tropical biodiversity icons by myrmecologists (Baccaro *et al.* 2015; Delabie *et al.* 2015). The subfamily Formicinae presents a high diversity in its nesting and food habits (Ward 2010; Baccaro *et al.* 2015), but is especially interesting at Bahia as it becomes the second most important subfamily (after the Myrmicinae and substituting the Ponerinae) in degraded or anthropized habitats (Delabie *et al.* 1999).

The prevalence of some genera, such as *Pheidole*, *Camponotus* and *Odontomachus* was also evident in our samples, and are always the ants with higher local abundance, diversity, variety of adaptations and larger geographic distribution in the Neotropics (Wilson 1976, 2003; Longino 2009; Shattuck 2005; Baccaro *et al.* 2015).

Some other ant genera, such as *Acanthostichus*, *Basiceros*, *Centromyrmex*, *Cerapachys*, *Mycetophylax*, *Oxyepoecus*, *Stegomyrmex* and *Tranopelta* were recorded, each one, once in a single locality. All of them are cryptobiotic ants, seldom collected (Hölldobler & Wilson 1958; Wilson 1958; Mackay 1996; Fernández 2003; Albuquerque & Brandão 2004; Feitosa *et al.* 2007; Feitosa *et al.* 2008; Delsinne *et al.* 2012; Baccaro *et al.* 2015). These genera consist of organisms inhabiting different strata of the soil and litter (Bolton & Fisher 2008; Baccaro *et al.* 2015). More precisely, ants of the genus *Centromyrmex* live in termitaries (Kempf 1966; Delabie 1995), while *Mycetophylax* spp. are found on beaches, dunes or sandy soils (Klingenberg & Brandão 2009; Baccaro *et al.* 2015). The cryptobiotic characteristics and nesting sites of most of these ants explain their rarity in the study, making them difficult to collect even with pitfalls or Winkler traps. On the other hand, the conspicuous *Dinoponera lucida* Emery, 1901 occurred in a single locality too (Itamarajú) although it was found in a number of samples (six). This ant, endangered with extinction although it occurs also in the Brazilian states of Espírito Santo and Minas Gerais, has had its distribution drastically reduced in southern of Bahia due to the fragmentation of its habitat the last decades and its low aptitude to colonize new areas (Peixoto *et al.* 2010).

We have also chosen highlighting up 10 species largely represented in our samplings (> 75 occurrences) (Fig. 2B). The two large predators, *Odontomachus haematodus* species (Linnaeus, 1758) and *Odontomachus meinerti* Forel, 1905 are widely distributed and easily found throughout Brazil; the both live in the litter or are found in association with bromeliads in epiphytic situation or when fallen on the floor (Baccaro *et al.* 2015; Silva *et al.* 2015). *Pheidode flavens* Roger, 1863 nests in different microhabitats in leaf-litter, ground or even in tree barks, and has a very broad range (Wilson 2003). *Pheidole radoszkowskii* Mayr, 1884 prefers relatively open, dry environments, and is frequently found in anthropized sites, as well as *Pheidole obscurithorax* Naves, 1985, found also associated with sandy soils in disturbed areas (Wilson 2003). Both species are found in forest clearings and borders too. *Ectatomma tuberculatum* (Olivier 1792) inhabits forest remnants but is especially common in Bahian agroforests (Delabie *et al.* 2007), while *Ectatomma brunneum* F. Smith, 1858 digs its nest in the ground in open fields or degraded areas; it is also found foraging on forest borders or trails (Delabie *et al.* 2007; Gomes *et al.* 2009; Vasconcelos 1999). *Wasmannia auropunctata* Roger, 1863 is occupying many habitats, essentially in the leaf-litter, in the forest remnants and agroforests of Bahia; this ant is especially well adapted to major changes in its environment and is well known as an invasive species in antropized landscapes and urban situations (Orivel *et al.* 2009). *Strumigenys denticulata* Mayr, 1887 is the commonest representative of the genus at Bahia, as well in many other series of Winkler samples from a range of regions of Brazil (Dias *et al.* 2008; Santos *et al.* 2015), all the ants of this genus live mainly in the leaf-litter and are active predators of small arthropods, essentially Collembola (Rusek 1998). The more frequent Ponerinae which appeared in our study, *Pachycondyla harpax* (Fabricius, 1804) is too one of the commonest species of the group in Brazil, occupying a variety of natural environments and as well as agroforests (Delabie *et al.* 2015; Wetterer 2016), where it forages on grounds covered by leaf-litter looking for preys.

The present study showed the epigaeic and leaf-litter ants diversity that occurs in the state of Bahia Atlantic Forest. As far as we know, it is one of the most representative inventories of ground ants performed in a unique biome in a single state in Brazil. According to Fisher & Smith (2008), species inventories enable the documentation of global diversity and production of relevant material for taxonomic studies. Furthermore, studies like this one are valuable tools by compiling information on the biota of threatened biomes, since the ants are responsible for relevant ecological processes in all the tropical terrestrial ecosystems (Hölldobler & Wilson 1990; Lach *et al.* 2010). Thus, such knowledge about ant diversity provide a necessary and basic information allowing to facilitate decision-making for developing effective management strategies aimed at the conservation of important environments, such as here, in Bahia FLs.

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