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# Diversity of trees and lianas in two sites in the coastal Atlantic Forest of Sergipe, northeastern Brazil

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**Abstract:** Here, we report the diversity of trees and lianas in two fragments of coastal Atlantic forest in the Brazilian state of Sergipe. We found a total of 314 trees in 86 species and 37 families in in the Trapsa forest, and 147 trees in 44 species and 28 families in the Junco forest. The diversity of lianas was similar between sites, with 16 species (10 families) being recorded at Trapsa, and 11 species (9 families) at Junco. The cluster analyses found distinct patterns of spatial similarity for trees and lianas, possibly reflecting differences in species richness between these two life forms. Overall, the results indicate that remnants of the Atlantic coastal forest in Sergipe still harbor a significant diversity of plant species.

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## Introduction

One of the 34 biodiversity hotspots identified by Mittermeier *et al.* (2004), the Brazilian Atlantic Forest, may contain between one and eight percent of the world's species (Silva and Casteleti 2003) even though only around 11.4% to 16% of its original cover remains (Ribeiro *et al.* 2009). The northernmost extreme of this biome stretches 1,500 km along the Atlantic coast from southern Bahia to Rio Grande do Norte. Deforestation began in this region in the early sixteenth century, shortly after its discovery by Portuguese explorers (Dean 1997) and intensified considerably during the twentieth century (Câmara 2003). In the state of Sergipe, the original Atlantic Forest cover has been reduced to only 9% of its original extent (Santos, 2009), distributed in small (< 1000 ha) and isolated fragments (Jerusalinsky *et al.* 2006). Nevertheless, these fragments can play an important role in the conservation of species at a regional scale, as they can sustain diversity and turnover (Arroyo-Rodríguez *et al*. 2009) as well as provide "stepping stones" for the dispersal of organisms within the landscape (Anderson and Jenkins 2006).

Forzza *et al.* (2012) estimated that approximately 20,000 species of vascular plants are found in the Brazilian Atlantic Forest biome, of which around 40% are endemic. Surveys are available for a number of sites in the northern Atlantic Forest, in particular in the states of Paraíba (Oliveira-Filho and Carvalho 1993; Barbosa 1996; 2008; Amazonas and Barbosa 2011; Barbosa *et al.* 2011; Gadelha Neto and Barbosa 2012) and Bahia (Thomas and Carvalho 1993; 1997; Amorim *et al*. 2008; Thomas *et al.* 2008), although some data are also available from Alagoas (Oliveira *et al*. 2004), Pernambuco (Alves-Araújo *et al.* 2008; Melo *et al.* 2011), and Rio Grande do Norte (Freire 1990; Oliveira *et al*. 2001; Cestaro and Soares 2008). For Sergipe, Landim and Siqueira (2001) listed 469 species of vascular plants in a large fragment in the south, and other studies (Vicente *et al*. 2005; Mendes *et al*. 2009; Dantas *et al*. 2010; Lucena *et al*. 2010) pointed a varied number of species (114, 552, 24, 193, respectively) in the Serra de Itabaiana, an ecotone where Atlantic forest grades into Caatinga. More recently Prata et al. (2013), in the first volume of the Flora of Sergipe, treated 494 species and estimated that it represents 25% of the state's flora. Clearly, more studies are needed, especially given the extensive loss of habitat. This study presents new data on the diversity of woody plants in Sergipe, based on surveys conducted in two fragments of Atlantic Forest which are critical for the conservation of species such as the endangered Coimbra-Filho's titi monkey, *Callicebus coimbrai* Kobayashi and Langguth 1999 (Souza-Alves *et al*. 2011; Souza-Alves 2013) and the critically endangered yellow-breasted capuchin, *Sapajus xanthosternos* Wied-Neuwied 1826 (Beltrão-Mendes *et al*. 2011).

## Materials and Methods

### Study area

The study was conducted in two fragments of semideciduous Atlantic Forest in Sergipe, Brazil (Figure 1), as part of a long-term study of the ecology of *Callicebus coimbrai* (Souza-Alves 2010, 2013; Souza-Alves *et al.* 2011). One site is the Fazenda Trapsa (denominated here as Trapsa or FT), which is located in the municipality of Itaporanga d'Ajuda (11°12′00″ S, 37°14′0″ W) in southern Sergipe, approximately 8 km from the coast. This area comprises six fragments of varying shapes, sizes (two ≥ 15 ≤ 50 ha, four > 50 to < 118 ha), and degrees of connectivity, encompassing a total area of approximately 600 ha of remaining forest. It is set within an anthropogenic matrix

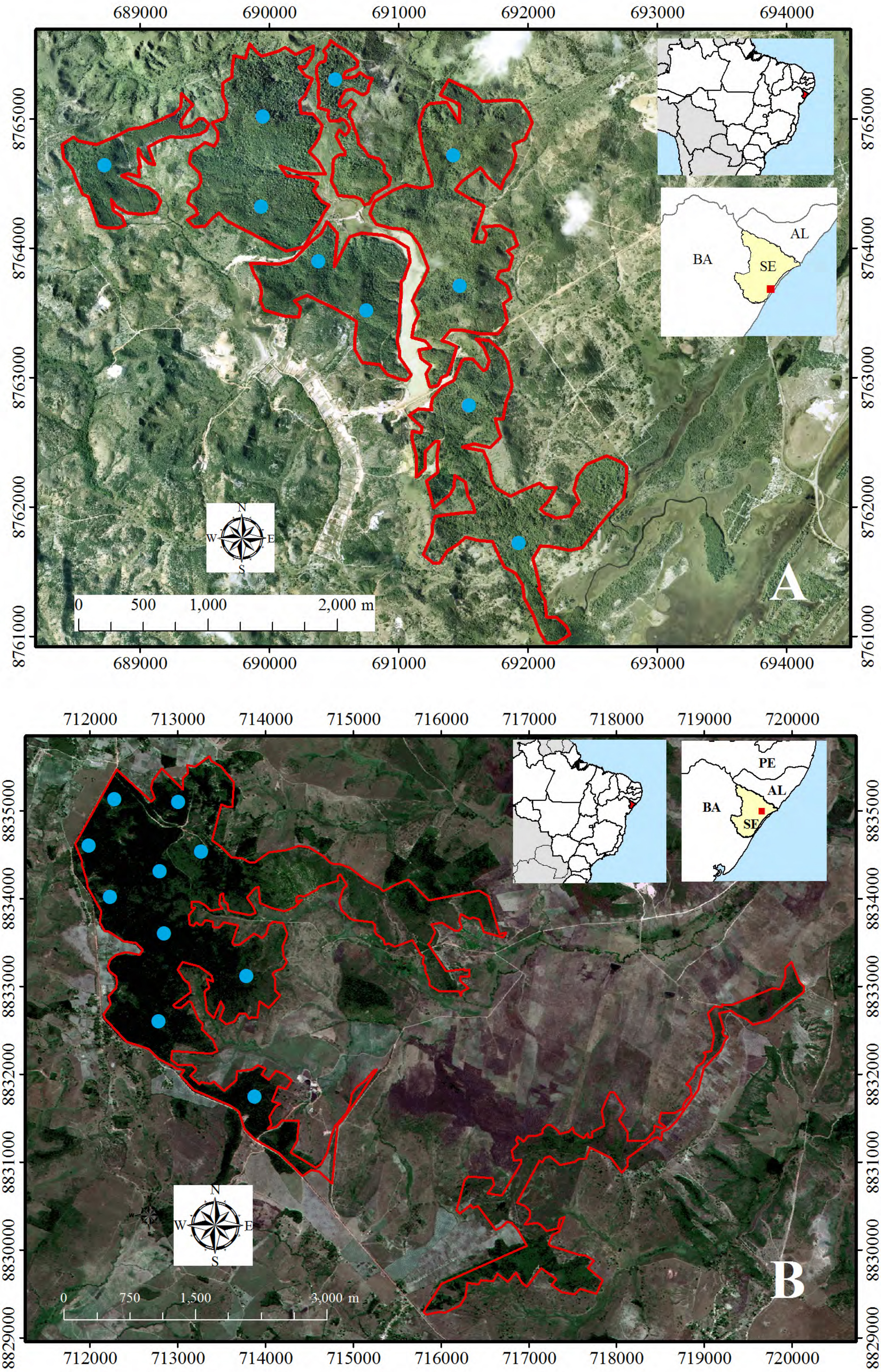


**FIGURE 1.** Map showing the *Callicebus coimbrai* study sites in the Brazilian state of Sergipe: A) Fazenda Trapsa and B) Mata do Junco Wildlife Refuge. The red outline is limit of each fragment and blue balls representing each sample plot.

of abandoned pastures, reservoirs, and ponds. The relief is relatively flat (22.7 m and 96.4 m asl) and the soil contains a significant amount of sand and clay (Souza-Alves 2013).

The second site is the Mata do Junco State Wildlife Refuge (denominated here as Junco or MJ) in the municipality of Capela (10°32′00″ S, 37°03′30″ W) in eastern Sergipe (Figure 1). This conservation unit was established with the primary objective of protecting the headwaters of the Lagartixo River and the local populations of *Callicebus coimbrai*. Junco comprises two large forest fragments, but the present survey was conducted exclusively in the largest remnant, which covers 522 ha. The altitude varies from 113 to 172 m asl and the soil has a higher concentration of silt than do those of Trapsa (Souza-Alves 2013). The surrounding matrix is composed of sugarcane plantations and subsistence plots on smallholdings.

The two sites have different levels of anthropogenic disturbance. The studied fragment at MJ presents an advanced stage of forest regeneration with mean diameter at breast height (10.7±9.7 cm) and height of trees (10.7±5.1 m) higher than at Trapsa (7.2±6.2 cm and 8.3±3.3 m, respectively) that presents a higher degree of anthropogenic disturbance and a higher density of lianas (940 ind/ha$^{-1}$ *vs*. 367 ind/ha$^{-1}$ at MJ) (Souza-Alves 2013).

Both sites are located within the same climate zone, classified as As in the Köppen system (Alvares *et al.* 2013), characterized by a rainy season between April and August, and a dry season between September and March. The historic rainfall series in FT (2000–2010) was 127±79 mm/month and in MJ (2003–2011) was 112±100 mm/month.

*Sampling design and analysis*

Trees and lianas were surveyed in 10 plots of 0.01 ha (1 m × 100 m) at each site. The plots were established randomly to provide a representative sample of the forest composition. A minimum distance of 500 m between plots was maintained in order to avoid pseudo-replication. At Trapsa, the plots were distributed among all six fragments, with one plot in each of the two small fragments ≤ 15 ≥ 50 ha and two plots in each of the four larger ones (>50 ha). At Junco, the 10 plots were distributed throughout the largest fragment. Within these plots, all trees with a diameter at breast height (dbh) ≥ 2.5 cm (Gentry 1982) and lianas with dbh ≥ 1 cm (Gerwing *et al*. 2006) were identified and registered. Only lianas rooted within the plots were considered.

The delimitation of plant families followed APG III (Angiosperm Phylogeny Group 2009) and the identification of species was based on all the available taxonomic literature and field guides (Buril *et al.* 2011; García-González and Alves 2011, 2012), photos of the type specimens accessible online and comparisons with identified material in the JPB herbarium. The vouchers are deposited in the JPB herbarium at the Federal University of Paraíba in João Pessoa, Brazil with duplicates at ASE, in the Federal University of Sergipe.

A UPGMA (Unweighted Pair Group Method with Arithmetic Mean) cluster analysis based on the Bray-Curtis similarity index was conducted in order to verify the floristic similarity between study sites and among plots via statistical software Past 3.x (Hammer *et al*. 2001).

## Results

A total of 588 individuals were recorded in the 20 plots (Table 1). At Trapsa, the 318 trees represented 83 species distributed in 39 families, whereas the 150 trees registered at Junco were assigned to only 41 species in 24 families. We recorded 91 individuals and 17 species (9 families) of lianas at Trapsa, and 29 individuals and 12 species (8 families) at Junco. Only one endangered tree species was recorded at Trapsa, *Inga suborbicularis* (Fabaceae), categorized as Vulnerable in the IUCN Red List (World Conservation Monitoring Center 1998).

Fabaceae was the richest family in Trapsa, with a total of 19 species, followed by Myrtaceae (8 spp.), Sapotaceae (6 spp.), and Malvaceae (4 spp.). Fabaceae was also the richest family at Junco, with six species, followed by Myrtaceae (4 spp.) and Moraceae (3 spp.). More than 50% of the families in both sites were represented by a single species.

Fabaceae, Lecythidaceae, Myrtaceae, Sapotaceae, and Arecaceae were the five most abundant families at Trapsa, where they represented 55% of all the individuals recorded. In Junco, Lecythidaceae comprised almost 14% of the individuals sampled, with Myrtaceae, Sapotaceae, Fabaceae, and Melastomataceae together accounting for slightly more than 33%.

Polygonaceae (4 species) and Fabaceae (3 species) were the richest liana families at Trapsa. Despite being represented by only a single species, the family Bignoniaceae was by far the most abundant at Trapsa, being represented by 42 individuals and, together with Polygonaceae (27 individuals), accounted for 76% of the lianas recorded at this site. At Junco, Polygonaceae, Bignoniaceae, and Sapindaceae were the only families represented by more than a single species, each with two. Here, just over 34% of the lianas recorded in the plots belonged to Polygonaceae, while Malpighiaceae and Dilleniaceae accounted each for 17% of the total.

The cluster analyses found distinct patterns of spatial similarity for trees (Figure 2A) and lianas (Figure 2B), possibly reflecting the differences in species richness between these two groups. In the case of trees, the two study sites were clearly separated and, in most cases, the individual plots were also relatively well separated. The lianas presented no distinction between areas, with some plots from different sites – most notably FT4 and MJ5, and FT6 and MJ1 – being more similar to one another than plots from the same site.

The tree community in Trapsa (Figure 3A) was dominated by two species, *Eschweilera ovata* and *Poecilanthe parviflora*, which together accounted for 18% of the individuals identified. None of the other species contributed more than 4% to the total of individuals. At Junco (Figure 3B), *E. ovata* was once again the predominant species, accounting for 14% of individuals in the sample plots, followed by *Pouteria bangii, Erythroxylum squamatum* and *Ocotea canaliculata*. These four species together accounted for 34% of the individuals identified. In fact, 45% of the tree species (34) recorded at Trapsa and 34% (14) at Junco were represented by only a single individual.

The abundance patterns recorded for the lianas were highly different (Figure 4). Two liana species

—*Adenocalymma comosum* and *Coccoloba lucidula*— were predominant at Trapsa (Figure 4A), while four—*Banisteriopsis nummifera, Coccoloba lucidula, Coccoloba parimensis*, and *Davilla kunthii* – were relatively common at Junco (Figure 4B), with all the others being relatively rare.

## Discussion

According to the Lista de Espécies da Flora do Brasil (2014), 1147 angiosperm species in 535 genera and 118 families can be found in Sergipe. Landim and Siqueira (2001) recorded 469 species representing 94 families in the Atlantic Forest region of Sergipe. Considering other recent papers on the flora of the Atlantic Forest domain in the state (Vicente *et al*. 2005; Lucena *et al*. 2010, Dantas *et al*. 2010, Mendes et al. 2010, and the first volume of Flora de Sergipe (Prata *et al*. 2013), the present study adds an additional 33 species and two families to species known to occur in Sergipe's Atlantic Forest.

The predominance of Fabaceae and Myrtaceae in tree species richness is consistent with the findings from previous studies in the Atlantic Forest of Sergipe (Landim and Siqueira 2001; Santos 2011; Santana, personal communication) and other states of the Brazilian Northeast (Pontes and Barbosa 2008). The predominance of Fabaceae is typical of Neotropical forests (Gentry

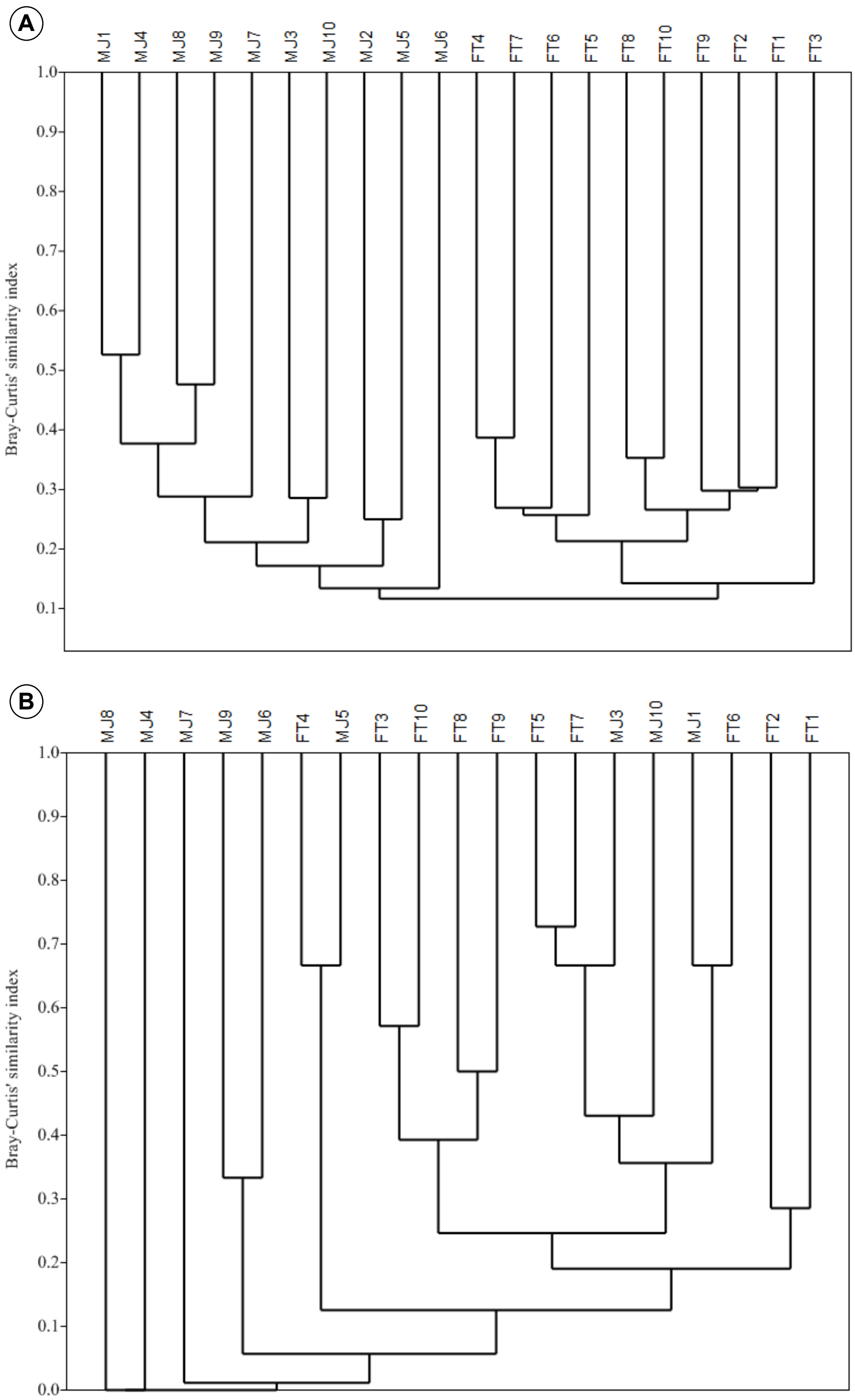


**Figure 2.** Dendrograms produced by the cluster analysis of Bray-Curtis similarity indices of species abundance of (A) trees and (B) lianas in the sample plots at Fazenda Trapsa (FT) and Mata do Junco State Wildlife Refuge (MJ), Sergipe, Brazil.

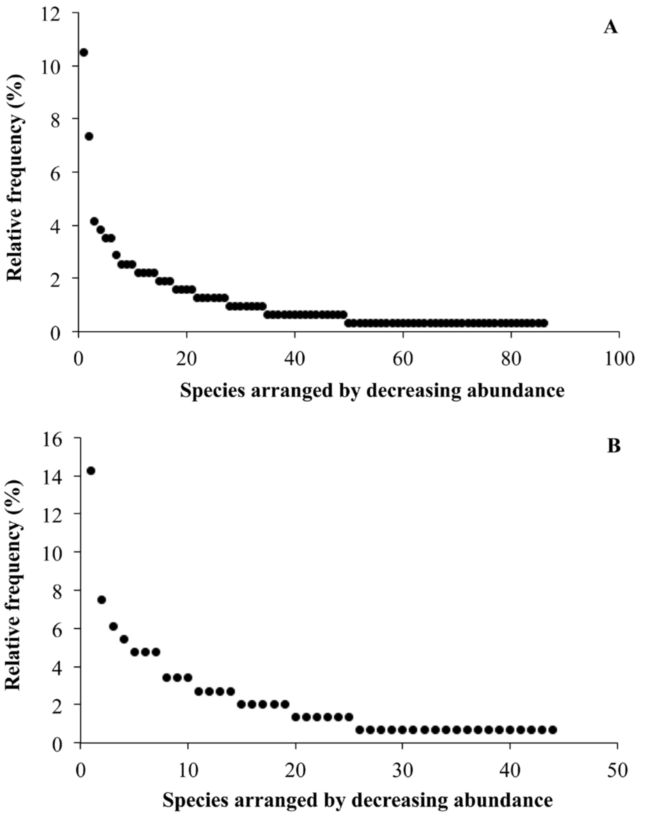


**Figure 3.** Whittaker plots of the tree species recorded ranked in order of relative abundance at (A) Fazenda Trapsa and (B) Mata do Junco State Wildlife Refuge in Sergipe, Brazil.

1988). In the present study, Fabaceae contributed more than ten percent of the tree species at each site, and almost 31% of the species represented new records for Sergipe, including *Poecilanthe parviflora*, one of the most abundant species in Trapsa. In contrast, Erythroxylaceae and Lauraceae were each represented by only one tree species at Junco. Nevertheless, the two species recorded there (*Erythroxylum squamatum* and *Ocotea canaliculata*) were among the most abundant.

The need for additional inventories in the state is further reinforced by the heterogeneity found between the two sites in the composition of their tree species, with over two-thirds of the species being exclusive to one site. The differences in species diversity are consistent with the history and conservation of the two sites –Junco may reflect a more advanced stage of succession within a relatively large, well-protected forest.

In general, the species richness of both trees and lianas found in the present study were consistent with the values recorded at other coastal Atlantic Forest sites in northeastern Brazil (Thomas 2008), except for the species-rich forests of southern Bahia (Amorim *et al.* 2008; Thomas *et al*. 2008), which are among the most diverse anywhere in the world (Mori *et al*. 1981; Thomas *et al.* 1998). The predominance of species represented by only one or two individuals is a typical scenario in tropical forests (Thomas 2008). In the specific case of lianas, species richness was much lower than that found in other seasonal forests in northeastern Brazil (Araújo and Alves 2010; García-González 2011; Gadelha Neto and Barbosa 2012), rain forests in Ecuador (Gentry 1991), Brazilian Amazonia (Gerwing and Farias 2000), and other areas of South America (Schnitzer and Bongers 2002). However, the principal result in this case was that Polygonaceae were more diverse at Trapsa, due to a high number of *Coccoloba* species. García-González (2011) also found a high number of *Coccoloba* species in the Atlantic forest fragments in the north of the state of Pernambuco.

The results of the present study indicate that the remnants of the coastal Atlantic forest in Sergipe still harbor a considerable diversity of plant species, which is still poorly understood and which may also be highly heterogeneous. The data reinforce the need for further inventories, not only to guarantee a better understanding of the region's biodiversity, but also to provide reliable parameters for the development of effective conservation and management strategies.

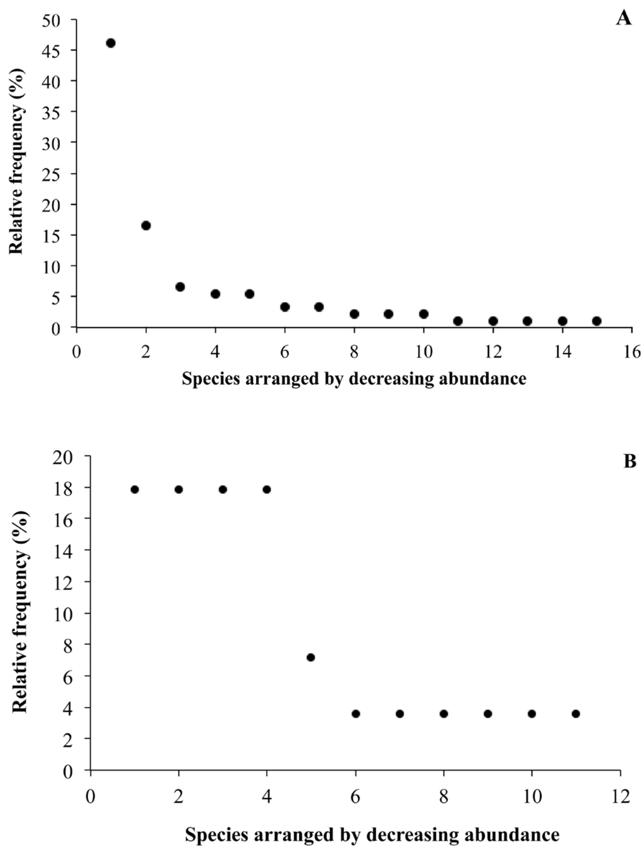


**Figure 4.** Whittaker plots of the liana species recorded ranked in order of relative abundance at Fazenda Trapsa (A) and Mata do Junco Wildlife Refuge (B), Sergipe, Brazil.

**Table 1.** Tree and liana species recorded at the FazendaTrapsa and Mata do Junco State Wildlife Refuge in Sergipe, Brazil. JPSA= J.P. Souza-Alves. Obs.: The families and species marked with an asterisk (*) are new records for the Atlantic forest of Sergipe according to Landim and Siqueira (2001), Vicente *et al.* (2005), Lucena *et al.* (2009), Dantas *et al.* (2010), Mendes *et al.* (2010), Prata *et al.* (2013) and Lista de Espécies da Flora do Brasil (2014).

| FAMILY | SPECIES | LIFE FORM | NUMBER OF INDIVIDUALS REGISTERED AT: | | VOUCHER NUMBER JPSA |
|---|---|---|---|---|---|
| | | | TRAPSA | JUNCO | |
| Anacardiaceae | *Tapirira guianensis* Aubl. | Tree | 8 | 3 | 5 |
| | *Thyrsodium spruceanum* Benth. | Tree | - | 2 | 535 |
| Annonaceae | *Guatteria* cf. *pogonopus* Mart. | Tree | 1 | - | 375 |
| | *Xylopia frutescens* Aubl. | Tree | 1 | 2 | 206 |
| Apocynaceae | **Aspidosperma spruceanum* Benth. ex. Müll. Arg. | Tree | 3 | 2 | 343 |
| | *Aspidosperma* sp. | Tree | 1 | | 430 |
| | *Himatanthus obovatus* (Müll. Arg.) Plumel | Tree | 5 | - | 285 |
| | *Himatanthus* sp. | Tree | 5 | - | 212 |
| | **Odontadenia lutea* (Vell.) Markgr. | Liana | - | 1 | 631 |
| Araliaceae | *Schefflera morototoni* (Aubl.) Maguire et al. | Tree | - | 6 | 638 |
| Aquifoliaceae* | **Ilex affinis* Gardner | Tree | 2 | - | 234 |
| Arecaceae | *Attalea* cf. *funifera* Mart. | Tree | 11 | - | 84 |
| | **Bactris bahiensis* Noblick ex A.J. Hend. | Tree | 8 | - | 23 |
| | *Desmoncus* sp. | Liana | - | 2 | 515 |
| | **Euterpe oleracea* Mart. | Tree | 1 | - | 19 |
| Bignoniaceae | **Adenocalymma comosum* (Cham.) DC. | Liana | 42 | - | 55 |
| | *Tabebuia elliptica* (DC.) Sandwith | Tree | 2 | - | 328 |
| | *Tabebuia rosealba* (Ridl.) Sandwith | Tree | 1 | - | 351 |
| | **Tabebuia stenocalyx* Sprague & Stapf | Tree | - | 3 | 538 |
| | Bignoniaceae 1 | Liana | - | 1 | 562 |
| | Bignoniaceae 2 | Liana | - | 1 | 567 |
| Boraginaceae | **Cordia rufescens* A.DC. | Tree | 1 | - | 233 |
| | *Cordia sellowiana* Cham. | Tree | 1 | - | 408 |
| | **Varronia multispicata* (Cham.) Borhidi | Tree | 1 | - | 162 |
| Burseraceae | *Protium heptaphyllum* (Aubl.) Marchand | Tree | 5 | 7 | 17 |
| Celastraceae | *Maytenus obtusifolia* Mart. | Tree | 1 | - | 242 |
| | *Maytenus* sp. | Tree | - | 1 | 623 |
| Chrysobalanaceae | *Licania littoralis* Warm. | Tree | 5 | - | 326 |
| Clusiaceae | **Garcinia brasiliensis* Mart. | Tree | 7 | - | 198 |
| Convolvulaceae | **Bonamia burchellii* (Choisy) Hallier f. | Liana | 3 | - | 307 |
| | *Bonamia maripoides* Hallier f. | Liana | 1 | - | 88 |
| Dilleniaceae | **Davilla kunthii* A. St.-Hill | Liana | 5 | 5 | 186 |
| Ebenaceae | *Diospyros gaultheriifolia* Mart. ex Miq. | Tree | 2 | - | 334 |
| Erythroxylaceae | *Erythroxylum simonis* Plowman | Tree | 1 | - | 46 |
| | *Erythroxylum squamatum* Sw. | Tree | - | 9 | 617 |
| Fabaceae | *Abarema jupunba* (Willd.) Britton & Killip | Tree | 1 | 1 | 280 |
| | *Andira fraxinifolia* Benth. | Tree | 1 | - | 156 |
| | *Andira* sp. | Tree | 1 | 1 | 550 |
| | *Apuleia leiocarpa* (Vogel) J.F. Macbr. | Tree | 7 | - | 325 |
| | *Bauhinia* cf. *acuruana* Moric. | Tree | 1 | - | 365 |
| | *Bauhinia* sp. | Liana | 1 | - | 43 |
| | *Bowdichia virgilioides* Kunth | Tree | - | 1 | 537 |
| | *Dioclea* sp. | Liana | 1 | - | 178 |
| | *Hymenaea rubiflora* Ducke | Tree | 3 | - | 31 |
| | *Inga capitata* Desv. | Tree | 13 | - | 11 |
| | **Inga suborbicularis*T.D.Penn. | Tree | 1 | - | 203 |
| | *Inga thibaudiana* DC. | Tree | - | 4 | 473 |
| | **Inga vera* subsp. *affinis* (DC.) T.D. Penn. | Tree | 1 | 1 | 447 |
| | *Parkia pendula* (Willd.) Benth. ex H.C. Hopkins | Tree | - | 2 | 480 |
| | *Phanera outimouta* (Aubl.) L.P. Queiroz | Liana | 2 | - | 93 |
| | **Poecilanthe parviflora* Benth. | Tree | 23 | - | 2 |
| | **Pterocarpus rohrii* Vahl | Tree | 3 | - | 292 |
| | *Stryphnodendron pulcherrium* (Willd.) Hochr. | Tree | 5 | - | 4 |
| | **Swartizia flaemingii* Raddi | Tree | 1 | - | 312 |
| | Fabaceae Papilionoideae 1 | Tree | 1 | - | 26 |
| | Fabaceae Papilionoideae 2 | Tree | 1 | - | 440 |
| | Fabaceae 1 | Tree | 2 | - | 340 |
| Hernandiaceae | **Sparattanthelium botocudorum* Mart. | Liana | 2 | 1 | 255 |
| Humiriaceae | *Sacoglottis mattogrossensis* Malme | Tree | - | 1 | 475 |
| Hypericaceae | *Vismia guianensis* (Aubl.) Choisy | Tree | 1 | - | 165 |
| Lauraceae | *Ocotea canaliculata* (Rich.) Mez | Tree | 4 | 8 | 308 |
| | *Ocotea duckei* Vattimo-Gil | Tree | 1 | - | 211 |
| | *Ocotea* sp. | Tree | 1 | - | 40 |
| Lecythidaceae | *Eschweilera ovata* (Cambess.) Mart. ex Miers | Tree | 33 | 21 | 20 |

**Table 1.** *Continued.*

| FAMILY | SPECIES | LIFE FORM | NUMBER OF INDIVIDUALS REGISTERED AT: | | VOUCHER NUMBER JPSA |
|---|---|---|---|---|---|
| | | | TRAPSA | JUNCO | |
| | *Lecythis pisonis* Cambess. | Tree | 7 | - | 35 |
| Loganiaceae* | *Strychnos* cf. *bahiensis* Krukoff & Barneby | Liana | 1 | - | 1 |
| Malpighiaceae | **Banisteriopsis nummifera* (A. Juss.) B. Gates | Liana | - | 5 | 552 |
| | *Byrsonima sericea* DC. | Tree | 4 | 5 | 91 |
| | *Heteropterys nordestina* Amorim | Liana | 2 | - | 291 |
| | Malpighiaceae 1 | Liana | 1 | - | 87 |
| Malvaceae | *Apeiba tibourbou* Aubl. | Tree | 1 | - | 346 |
| | **Eriotheca gracilipes* (K. Schum.) A. Robyns | Tree | 2 | - | 352 |
| | **Eriotheca macrophylla* (K. Schum.) A. Robyns | Tree | 2 | - | 239 |
| | **Luehea divaricata* Mart. & Zucc. | Tree | 6 | 1 | 166 |
| | *Luehea ochrophylla* Mart. | Tree | - | 2 | 565 |
| Melastomataceae | *Miconia holosericea* (L.) DC. | Tree | - | 3 | 458 |
| | *Miconia prasina* (Sw.) DC. | Tree | - | 7 | 464 |
| | *Miconia* sp. | Tree | 1 | - | 195 |
| | *Mouriri* sp. | Tree | 2 | - | 86 |
| Meliaceae | *Guarea* sp. | Tree | - | 1 | 585 |
| | *Trichilia lepidota* Mart. | Tree | 4 | - | 183 |
| Moraceae | **Brosimum gaudichaudii* Trécul | Tree | - | 1 | 481 |
| | *Brosimum guianensis* (Aubl.) Huber | Tree | - | 1 | 543 |
| | **Sorocea guilleminiana* Gaudich. | Tree | - | 1 | 582 |
| Myrtaceae | *Campomanesia dichotoma* (O. Berg.) Mattos | Tree | - | 7 | 456 |
| | *Eugenia* cf. *excelsa* O. Berg | Tree | 11 | - | 39 |
| | *Eugenia punicifolia* (Kunth) DC. | Tree | 3 | - | 80 |
| | *Myrcia decorticans* DC. | Tree | - | 6 | 524 |
| | *Myrcia guianensis* (Aubl.) DC. | Tree | 1 | 4 | 364 |
| | *Myrcia multiflora* (Lam.) DC. | Tree | 4 | - | 241 |
| | *Myrcia splendens* (Sw.) DC. | Tree | 5 | 3 | 205 |
| | *Psidium guajava* L. | Tree | 1 | - | 191 |
| | Myrtaceae 1 | Tree | 2 | - | 41 |
| | Myrtaceae 2 | Tree | 4 | - | 157 |
| Nyctaginaceae | *Guapira obtusata* (Jacq.) Little | Tree | 2 | 4 | 202 |
| | *Guapira opposita* (Vell.) Reitz | Tree | 2 | 5 | 297 |
| Ochnaceae | *Ouratea cuspidata* (A.St.-Hil.) Engl. | Tree | 1 | - | 45 |
| Olacaceae | Olacaceae 1 | Tree | 1 | - | 24 |
| Peraceae | *Chaetocarpus myrsinites* Baill. | Tree | 6 | - | 79 |
| | *Pogonophora schomburgkiana* Miers. ex Benth. | Tree | 11 | - | 51 |
| Picramniaceae | *Picramnia bahiensis* Turcz. | Tree | 1 | - | 296 |
| | *Picramnia* sp. | Tree | - | 3 | 587 |
| Polygonaceae | *Coccoloba laevis* Casar. | Liana | 5 | - | 56 |
| | *Coccoloba lucidula* Benth. | Liana | 15 | 5 | 96 |
| | **Coccoloba paraensis* Meisn. | Liana | 3 | - | 8 |
| | **Coccoloba parimensis* Benth. | Liana | 3 | 5 | 303 |
| | *Coccoloba rosea* Meisn. | Tree | 2 | - | 44 |
| | **Coccoloba striata* Benth. | Liana | 1 | - | 170 |
| Proteaceae | **Roupala paulensis* Sleumer | Tree | 1 | - | 376 |
| Rubiaceae | *Alseis* sp. | Tree | 1 | - | 9 |
| | **Cordiera myrciifolia* (K. Schum.) C.H. Perss. & Delprete | Tree | 1 | - | 210 |
| | *Guettarda* cf. *platyphylla* Müll. Arg. | Tree | - | 1 | 492 |
| | **Guettarda viburnoides* Cham. & Schltdl. | Tree | 12 | - | 310 |
| Salicaceae | *Casearia* sp. | Tree | 1 | - | 83 |
| Sapindaceae | *Allophylus edulis* (A.St.-Hil. ) Hieron. ex. Niederi. | Tree | 2 | 2 | 124 |
| | *Cupania impressinervia* Acev.-Rodr. | Tree | 7 | 2 | 34 |
| | *Serjania paucidentata* DC. | Liana | - | 1 | 606 |
| | Sapindaceae 1 | Liana | - | 1 | 579 |
| Sapotaceae | *Manilkara salzmannii* (A. DC.) H.J. Lam | Tree | 6 | 1 | 306 |
| | **Pouteria bangii* (Rusby) T.D. Penn. | Tree | 8 | 11 | 16 |
| | *Pouteria gardneri* (Mart. & Miq.) Baehni | Tree | 3 | - | 121 |
| | *Pouteria venosa* (Mart.) Baehni | Tree | 3 | - | 33 |
| | *Pouteria* sp. | Tree | 4 | - | 12 |
| | Sapotaceae 1 | Tree | 1 | - | 144 |
| Solanaceae | *Solanum* sp. | Tree | - | 3 | 586 |
| Simaroubaceae | **Simaba cedron* Planch. | Tree | 2 | - | 281 |
| Urticaceae | *Cecropia pachystachia* Trécul | Tree | 2 | - | 171 |
| | *Cecropia* sp. | Tree | - | 1 | 599 |
| Vitaceae | *Cissus erosa* Rich. | Liana | 3 | 1 | 289 |

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