



Serra do Urubu, a biodiversity hot-spot for angiosperms in the northern Atlantic Forest (Pernambuco, Brazil)

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Abstract: A list of angiosperms from Serra do Urubu, a montane forest area in the state of Pernambuco, is here provided. Based on 14 botanical expeditions and material deposited in herbaria, 832 taxa belonging to 442 genera and 118 families have been recorded in this area, with about 90% of the taxa identified to species level. The richest families are Orchidaceae (86 spp.), Fabaceae (51 spp.) and Rubiaceae (42 spp.). *Miconia* and *Solanum* (14 spp. each), and *Psychotria* (13 spp.) are the richest genera. About 15% of the recorded species are endemic to the Atlantic Forest, and another 10% are disjunct between this area and the Amazon Rainforest. The results indicate that the Serra do Urubu is one of the richest areas in terms of number of species of the Atlantic Forest in the Northeast, and corroborates the Pernambuco Endemism Center.

Key words: Brazilian Northeast; endemic species; floristics; hotspot; rock outcrops

INTRODUCTION

The Atlantic Forest is considered one of the world's 34 biodiversity hotspots, possesses high species richness and endemism levels, a wide latitudinal extension (3°S–30°S) and various types of vegetation, yet despite this, only about 7–12% of its original area remains (Myers et al. 2000; Mittermeier et al. 2004; Ribeiro et al. 2009). Myers et al. (2000) estimated that there were 20,000 species of plants, of which 8,000 (40%) were endemic to this region and subsequently Stehmann et al. (2009), in a more detailed compilation, recorded 15,782 species for the Brazilian Atlantic Forest, with 13,708 angiosperms, of which 49% were considered endemic. Based on the discovery of new species and the general advancement of knowledge of Brazilian plants, the *Lista de Espécies da Flora do Brasil* (2015) enumerates 15,282 species of flowering plants in the

Atlantic Forest domain, and of these, 8,601 (56.3%) are endemic. The Atlantic Forest is first among Brazilian domains for threatened species (1,544 species), in addition to those that have insufficient data (265) and those which are not endangered but are considered of interest for conservation and research (337) (Livre Vermelho da Flora do Brasil 2013).

According to Stehmann et al. (2009), Orchidaceae, Fabaceae, Asteraceae, Bromeliaceae, Poaceae, Myrtaceae, Melastomataceae and Rubiaceae are the most representative families in the Atlantic Forest. Bromeliaceae and Orchidaceae especially noteworthy for their high richness and endemism. Local floristic surveys along the Atlantic Forest demonstrate that these families figure among the richest in distinct areas of this domain, but in different proportions depending on, for example, altitude, latitude, and vegetation type (Barros et al. 1991; Alves-Araújo et al. 2008; Amorim et al. 2008, 2009; Scheer and Kinoshita 2009; Coelho and Amorim 2014; Forzza et al. 2014; Landim et al. 2015).

Floristic inventories of the Atlantic Forest in Pernambuco were performed in areas of restingas and lowland forests (up to 100 m in altitude) by Guedes (1998), Rodal et al. (2005a), Almeida Jr. et al. (2007, 2009), Sacramento et al. (2007), Soares Júnior et al. (2008), Pessoa et al. (2009), Cavalcanti (2012) and Alves et al. (2013). These inventories point out the taxonomic diversity that ranges from 101 to 830 species, demonstrating the high species richness of some areas (Cavalcanti 2012; Alves et al. 2013). Inventories that include areas of submontane and montane forests (above 100 m altitude) in the state are scarcer (Rodal et al. 2005b; Barreto et al. 2006; Grillo et al. 2006; Rodal and Sales 2007; Ferraz and Rodal 2008); they document the number of angiosperm species as between 69 and 375.

The Catende Complex (which includes Serra do Urubu) is located in the southern portion of the state of Pernambuco and is indicated by the MMA (2007) as

of extreme biological importance and is considered a priority area for conservation of the flora of the Atlantic Forest domain (Martinelli 2007). The area has been the subject of many studies showing great diversity of birds (Roda 2002; Bencke et al. 2006), frogs (Santos and Carnaval 2002), lycophytes and ferns (Barros et al. 2006), Bromeliaceae and Orchidaceae (Leme and Siqueira-Filho 2006; Siqueira-Filho and Felix 2006; Pessoa and Alves 2015b), and even new taxa to science (Carnaval and Peixoto 2004; Chautems et al. 2005; Leme and Siqueira-Filho 2006; Amorim and Alves 2012a, 2015; Costa-Lima and Alves 2013; Giacomini et al. 2013; Gregório et al. 2014; Pessoa and Alves 2015a; Pessoa et al. 2014a, 2014b; Sobral 2013).

Therefore, the objectives of this study were the following: (1) to perform an inventory of angiosperms in remnant montane forests in the southern portion of the state of Pernambuco, (2) to corroborate the floristic patterns observed in other areas of Atlantic Forest in the region (the richest families, habits and similarity between areas based on representative taxonomic groups), (3) to document new occurrences for the state of Pernambuco and species with some degree of threatened or rare status.

MATERIALS AND METHODS

The floristic survey was carried out in the Serra do Urubu (08°42'48" S, 035°50'38" W), located between the municipalities of Lagoa dos Gatos, Jaqueira and São Benedito do Sul, in the Zona da Mata Sul in the state of Pernambuco, about 160 km from Recife (Figure 1). Besides being considered by MMA (2007) as a priority conservation area for the Atlantic Forest domain, the municipality of Jaqueira was indicated by Martinelli (2007) as an area of extreme importance, requiring priority action to carry out an inventory and create a

protected area. In addition, Jaqueira was highlighted by Kasecker et al. (2009) as a Key Biodiversity Area, based on the presence of a rare species of Bromeliaceae (*Neoregelia pernambucana* Leme & J.A. Siqueira-Filho).

The area is characterized as the border between montane and submontane seasonal forest (*sensu* Veloso et al. 1991), consisting of areas of remaining forest and rock outcrops, and surrounded by areas of sugar-cane (Usina Colônia), livestock and subsistence agriculture on small farms. The average rainfall between 1994 and 2013 was 1373.1 mm/year (data from the headquarters of Usina Colônia). The altitude varies between 600 and 780 m, and the area experiences fog at the highest points during the winter months, as well as having ponds and streams.

Samples were collected in the private area of Private Reserve of Natural Patrimony (PRNP) Frei Caneca, owned by Usina Colônia, and PRNP Pedra D'Anta, belonging to Society for Conservation of Birds of Brazil (SAVE Brasil), which are adjacent areas and together form a continuous fragment of approximately 1,000 ha of Atlantic Forest in the Serra do Urubu (Bencke et al. 2006). Field expeditions were conducted between August 2010 and December 2014, including both the dry and rainy seasons, totaling 14 trips and approximately 50 days of sampling effort. The material collected was treated according to the usual botanical techniques (Peixoto and Maia 2013) and deposited at Herbarium UFP with duplicates distributed to the herbaria ASE, FRA, HRCB, JPB, NY, RB and UFRN (acronyms according to Thiers 2015).

Identification of the material was performed by consulting the taxonomic literature, the collections of the UFP and JPB herbaria and specialists as indicated in Table 1. The classification of families, name of the species, abbreviations of authors, geographical distribution and

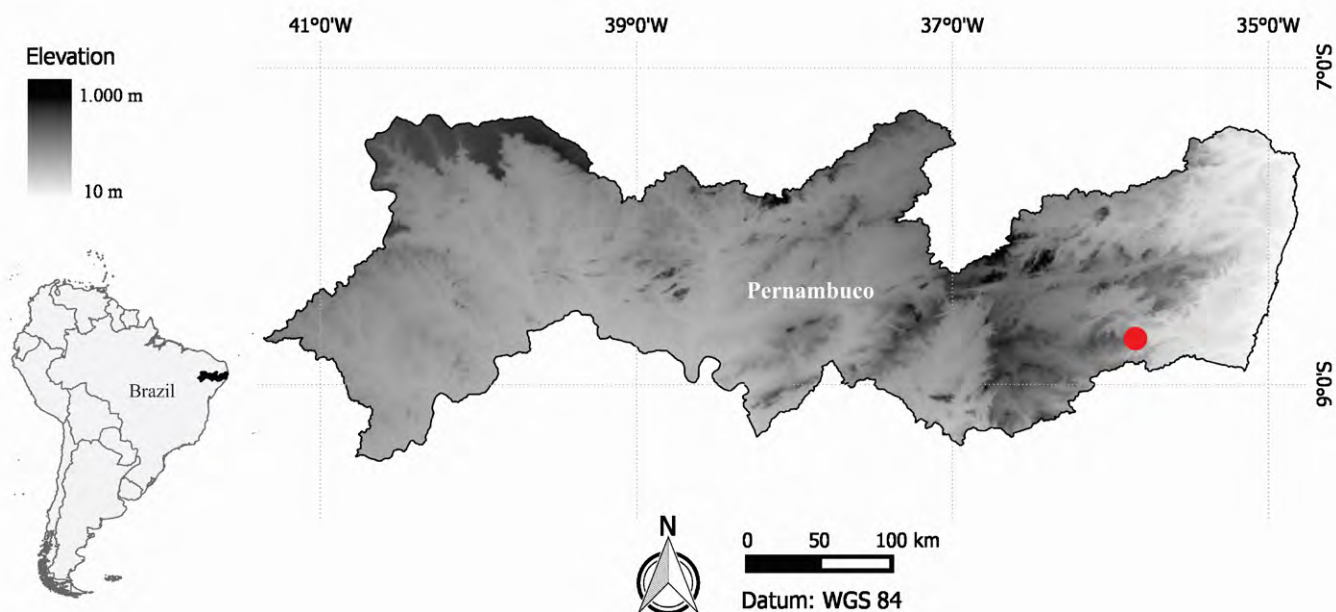


Figure 1: Map showing the location of the Serra do Urubu, Pernambuco state.

conservation status followed the *Lista de Espécies da Flora do Brasil* (2015) and the *Livro Vermelho da Flora do Brasil* (2013). The list presented here is mainly the product of collections made during this work, but other vouchers collected previously in the study area and deposited in the herbaria HST (Herbarium of Forestry, Federal Rural University of Pernambuco - not indexed), JPB and UFP were also used.

The identified species were categorized into structural groups as (1) Herbs, (2) Bushes, (3) Trees and related forms (including treelets and arborescent plants like palms and bamboo) and (4) Climbers (woody or herbaceous vines). A further categorization was also adopted for the substrate: (1) Terrestrial, (2) Saxicolous (3) Epiphytic and/or Hemi-epiphytic and (4) Aquatic or Wetland. It is noteworthy that in this case, some species occupy more than one type, which is a common condition in some representatives of Araceae, Bromeliaceae and Orchidaceae. Finally, the

species were organized into groups based on their source of nutrition: (1) Autotrophic, (2) Heterotrophic (parasitic or hemiparasitic) or (3) Mycoheterotrophic.

RESULTS

In the study area 832 taxa were recorded, belonging to 442 genera and distributed in 118 families. About 90% of the morphotypes were identified to the species level (750 spp.), 6% only to genus (50), 3% to family level and the remaining 1% undetermined. The most representative families were Orchidaceae (86 species), Fabaceae (51 spp.), Rubiaceae (42 spp.), Bromeliaceae (41 spp.), Poaceae (40 spp.), Cyperaceae (34 spp.), Asteraceae (31 spp.), Melastomataceae (30 spp.), Solanaceae (24 spp.) and Myrtaceae (23 spp.), comprising about 50% of the species found in the area. The richest families in number of species also have greater richness in genera such as Orchidaceae (51 genera), Fabaceae (30), Poaceae (24),

Table 1. List of the 750 taxa of angiosperms identified to species level of the Serra do Urubu. The species follow in alphabetical order of family and species, respectively, with information of habit and voucher specimens of the referenced taxon. Samples are deposited in HST, JPB and UFP. * Alien species. ** Name followed Zanotti et al. (2012).

Family	Species	Habit	Voucher
Acanthaceae (Bruno S. Amorim)			
	<i>Dicliptera mucronifolia</i> Ness	Subshrub	J.L. Viana et al. 351
	<i>Hygrophila costata</i> Nees	Subshrub	J.L. Viana et al. 76
	<i>Justicia symphyantha</i> (Nees ex Mart) Lindau	Subshrub	D. Araújo et al. 1751
	<i>Ruellia cearensis</i> Lindau	Shrub	B.S. Amorim et al. 1056
	<i>Ruellia geminiflora</i> Kunth	Subshrub	J.L. Viana et al. 198
	<i>Ruellia menthoides</i> (Nees) Hiern	Subshrub	E. Pessoa and A. Melo 472
	<i>Ruellia ochroleuca</i> Mart. ex Nees	Subshrub	G.A. Gomes-Costa et al. 196
Alismataceae (James L. Costa-Lima)			
	<i>Helanthium tenellum</i> (Martius) Britton	Herb	J.L. Costa-Lima et al. 863
Alstroemeriaceae (Aline Melo)			
	<i>Bomarea edulis</i> (Tussac) Herb.	Herbaceous climber	G.A. Gomes-Costa et al. 218
Amaryllidaceae (Anderson Alves-Araújo)			
	<i>Hippeastrum puniceum</i> (Lam.) Kuntze	Herb	J.L. Viana et al. 338
	<i>Hippeastrum stylosum</i> Herb.	Herb	E. Pessoa and A. Melo 445
Anacardiaceae (Bruno S. Amorim)			
	<i>Anacardium occidentale</i> L.	Tree	B.S. Amorim et al. 1287
	<i>Tapirira guianensis</i> Aubl.	Tree	A. Melo et al. 572
	<i>Thyrsodium spruceanum</i> Benth.	Tree	A. Melo et al. 785
Annonaceae (Aline Melo and Bruno S. Amorim)			
	<i>Anaxagorea dolichocarpa</i> Sprague & Sandwith	Tree	S.O. Santos et al. 178
	<i>Annona montana</i> Macfad.	Tree	B.S. Amorim et al. 1265
	<i>Cymbopetalum brasiliense</i> (Vell.) Benth. ex Baill.	Tree	D. Araújo et al. 1898
	<i>Guatteria pogonopus</i> Mart.	Tree	E. Pessoa et al. 458
	<i>Guatteria oligocarpa</i> Mart.	Tree	M.A. Chagas et al. 16
	<i>Xylopia frutescens</i> Aubl.	Tree	A. Melo et al. 783
Apiaceae (Bruno S. Amorim)			
	<i>Spananthe paniculata</i> Jacq.	Herb	A. Melo et al. 569
Apocynaceae (Aline Melo, Diogo Araújo and Thales Coutinho)			
	<i>Allamanda cathartica</i> L.	Shrub-Tree	S.O. Santos et al. 177
	<i>Aspidosperma spruceanum</i> Benth. ex Müll.Arg.	Tree	B.S. Amorim et al. 1263
	<i>Blepharodon pictum</i> (Vahl) W.D. Stevens	Woody climber	D. Araújo et al. 1872
	<i>Ditassa oxyphylla</i> Turcz.	Woody climber	J.L. Costa-Lima et al. 746
	<i>Himatanthus bracteatus</i> (A. DC.) Woodson	Tree	E. Pessoa and A. Melo 474
	<i>Mandevilla dardanoi</i> M.F.Sales, Kin-Gouv. & A.O. Simões	Shrub	B.S. Amorim et al. 966
	<i>Mandevilla hirsuta</i> (A.Rich.) K.Schum.	Woody climber	T.S. Coutinho et al. 71
	<i>Mandevilla microphylla</i> (Stadelm.) M.F.Sales & Kin.-Gouv.	Woody climber	T.S. Coutinho et al. 43

Continued

Table 1. Continued.

Family	Species	Habit	Voucher
	<i>Mandevilla scabra</i> (Hoffmanns. ex Roem. & Schult.) K. Schum.	Woody climber	A. Melo et al. 568
	<i>Marsdenia loniceroides</i> (Hook.) E. Four.	Shrub	A. Melo et al. 460
	<i>Matelea ganglinosa</i> (Vell.) Rapini	Herbaceous climber	J.L. Costa-Lima et al. 747
	<i>Matelea orthosioides</i> (E. Fourn.) Fontella	Woody climber	D. Araújo et al. 1773
	<i>Oxypetalum cf. harleyi</i> (Fontella & Goyder) Farinaccio	Woody climber	B.S. Amorim et al. 1785
	<i>Peltastes peltatus</i> (Vell.) Woodson	Woody climber	A. Melo et al. 757
	<i>Rauvolfia grandiflora</i> Mart. ex A. DC.	Shrub-Tree	M.A. Chagas et al. 7
	<i>Rauvolfia moricandii</i> A.DC.	Tree	S.O. Santos et al. 188
	<i>Tabernaemontana flavicans</i> Willd. ex Roem. & Schult.	Shrub	G.A. Gomes-Costa et al. 195
Araceae (Jefferson R. Maciel and Bruno S. Amorim)			
	<i>Anthurium affine</i> Schott	Herb	E. Pessoa et al. 496
	<i>Anthurium bromelicola</i> Mayo & L.P. Félix	Herb	D. Araújo et al. 2418
	<i>Anthurium gracile</i> (Rudge) Lindl.	Herb	A. Melo et al. 652
	<i>Anthurium pentaphyllum</i> (Aubl.) G. Don.	Herb	B.S. Amorim et al. 1042
	<i>Anthurium scandens</i> (Aubl.) Engl.	Herb	A. Melo et al. 758
	<i>Caladium bicolor</i> (Aint.) Vent.	Herb	D. Araújo et al. 2392
	<i>Monstera adansonii</i> var. <i>klotzschiana</i> (Schott) Madson	Herb	B.S. Amorim et al. 1596
	<i>Philodendron acutatum</i> Schott	Herb	E.D. Mendonça et al. 49
	<i>Philodendron ornatum</i> Schott	Herb	B.S. Amorim et al. 907
	<i>Philodendron pedatum</i> (Hook.) Kunth	Herb	B.S. Amorim et al. 1264
	<i>Philodendron rudgeanum</i> Schott	Herb	D. Araújo et al. 1935
	<i>Syngonium vellozianum</i> Schott	Herb	B.S. Amorim et al. 915
	<i>Zomicarpa pythonium</i> (Mart.) Schott	Herb	A. Melo et al. 744
Araliaceae (Bruno S. Amorim)			
	<i>Oreopanax capitatus</i> (Jacq.) Decne. & Planch.	Tree	A. Viana et al. 529
	<i>Schefflera morototoni</i> (Aubl.) Maguire et al.	Tree	B.S. Amorim et al. 1579
Areaceae (Diogo Araújo)			
	<i>Bactris acanthocarpa</i> Mart.	Arborescent	B.S. Amorim et al. 1068
	<i>Desmoncus</i> aff. <i>phoenicocarpus</i> Barb.Ro	Shrub	D.S. Correia et al. 83
	<i>Desmoncus polyacanthos</i> Mart.	Woody climber	D. Araújo et al. 2446
	<i>Euterpe edulis</i> Mart.	Arborescent	A. Melo et al. 709
	<i>Geonoma pauciflora</i> Mart.	Arborescent	D. Araújo et al. 1766
	<i>Geonoma pohliana</i> Mart.	Arborescent	S.O. Santos et al. 303
Aristolochiaceae (Ariclenes Araújo)			
	<i>Aristolochia labiata</i> Willd	Woody climber	B.S. Amorim et al. 906
Asteraceae (Suellen O. Santos and Jéssica L. Viana)			
	<i>Acmella uliginosa</i> (Sw.) Cass.	Herb	S.O. Santos et al. 194
	<i>Ageratum conyzoides</i> L.	Herb	S.O. Santos et al. 175
	<i>Baccharis</i> cf. <i>malmei</i> Joch. Müll.	Shrub	J.L. Costa-Lima et al. 878
	<i>Chresta pacourinoides</i> (Mart. ex DC.) Siniscalchi & Loeuille	Herb	S.O. Santos et al. 288
	<i>Conocliniopsis prasilifolia</i> (DC.) R.M. King & H. Rob.	Subshrub	J.L. Viana et al. 314
	<i>Cosmos caudatus</i> Kunth	Herb	S.O. Santos et al. 312
	<i>Cyrtocymura scorpioides</i> (Lam.) H. Rob.	Subshrub	S.O. Santos et al. 174
	<i>Diacranthera crenata</i> (Schldtl. ex Mart.) R.M. King & H. Rob.	Shrub	D. Araújo et al. 1754
	<i>Elephantopus mollis</i> Kunth.	Herb	J.L. Viana et al. 316
	<i>Emilia fosbergii</i> Nicolson	Herb	A. Melo et al. 689
	<i>Emilia sonchifolia</i> (L.) DC. ex Wight	Herb	A. Melo et al. 450
	<i>Erechtites valerianifolius</i> (Wolf) DC.	Herb	J.L. Viana et al. 348
	<i>Lepidaploa acutangula</i> (Gardner) H. Rob.	Shrub	D. Araújo et al. 1719
	<i>Mikania</i> cf. <i>biformis</i> DC.	Woody climber	J. Leal et al. 45
	<i>Mikania micrantha</i> Kunth	Woody climber	E. Pessoa and A. Melo 486
	<i>Mikania psilostachya</i> DC.	Woody climber	S.O. Santos et al. 193
	<i>Mikania</i> cf. <i>ternata</i> (Vell.) B.L. Rob.	Herbaceous climber	D. Araújo et al. 1728
	<i>Pterocaulon</i> cf. <i>alopecuroides</i> (Lam.) DC.	Subshrub	D. Araújo et al. 1922
	<i>Rolandra fruticosa</i> (L.) Kuntze	Subshrub	A. Melo et al. 627
	<i>Sonchus oleraceus</i> L.	Herb	S.O. Santos et al. 301
	<i>Sphagneticola trilobata</i> (L.) Pruski	Herb	J.L. Viana et al. 250
	<i>Tilesia baccata</i> (L. f.) Pruski	Shrub	J.L. Viana et al. 196
	<i>Vernonanthura brasiliiana</i> (L.) H. Rob.	Shrub	E. Pessoa and A. Melo 469
Begoniaceae (Aline Melo and Katarina Pinheiro)			
	<i>Begonia lealii</i> Brade	Herb	A. Melo et al. 461
	<i>Begonia obdeltata</i> Gregório & E.L. Jaques	Herb	K. Pinheiro et al. 13
	<i>Begonia reniformis</i> Dryand	Herb	E. Pessoa and A. Melo 464
	<i>Begonia saxicola</i> A. DC.	Herb	A. Melo et al. 651

Continued

Table 1. Continued.

Family	Species	Habit	Voucher
Bignoniaceae (Diogo Araújo)			
	<i>Adenocalymma comosum</i> (Cham.) DC.	Woody climber	E.D. Mendonça et al. 67
	<i>Bignonia corymbosa</i> (Vent.) L.G. Lohmann	Woody climber	G.A. Gomes-Costa et al. 193
	<i>Handroanthus chrysotriches</i> (Mart ex A.DC.) Mattos	Tree	B.S. Amorim et al. 1846
	<i>Lundia longa</i> (Vell.) DC.	Woody climber	E. Pessoa et al. 476
Boraginaceae (José I. Melo)			
	<i>Cordia nodosa</i> Lam.	Shrub	J.B.S. Oliveira et al. 81
	<i>Cordia sellowiana</i> Cham	Shrub	B.S. Amorim et al. 1235
	<i>Varronia multispicata</i> (Cham.) Borhidi	Shrub-Tree	B.S. Amorim et al. 778
	<i>Varronia polycephala</i> Lam.	Shrub	E. Pessoa et al. 487
Bromeliaceae (Jefferson R. Maciel, Rafael Louzada, Gardene M. Sousa and Maria G. Wanderley)			
	<i>Aechmea catendensis</i> J.A. Siqueira-Filho & Leme	Herb	J.R. Maciel et al. 1914
	<i>Aechmea cephaloides</i> J.A. Siqueira & Leme	Herb	J.R. Maciel et al. 2012
	<i>Aechmea costantinii</i> (Mez) L.B. Sm.	Herb	J.R. Maciel et al. 1926
	<i>Aechmea fulgens</i> Brongn.	Herb	J.R. Maciel et al. 1909
	<i>Aechmea gustavo</i> J.A. Siqueira & Leme	Herb	J.R. Maciel et al. 1929
	<i>Aechmea leptantha</i> (Harms) Leme & J.A. Siqueira	Herb	J.R. Maciel et al. 1925
	<i>Aechmea mertensii</i> (G. Mey.) Schult. & Schult. f.	Herb	E. Pessoa et al. 437
	<i>Aechmea patentissima</i> (Mart. ex Schult. & Schult. f.) Baker	Herb	J.R. Maciel et al. 1912
	<i>Aechmea pernambucensis</i> J.A. Siqueira & Leme	Herb	J.A. Siqueira 736
	<i>Aechmea serragrandensis</i> Leme & J.A. Siqueira	Herb	J.R. Maciel et al. 2008
	<i>Ananas comosus</i> (L.) Merrill	Herb	J.A. Siqueira-Filho 1089
	<i>Araeococcus chlorocarpus</i> (Wawra) Leme & J.A. Siqueira	Herb	J.R. Maciel et al. 1915
	<i>Billbergia morelii</i> Brongn.	Herb	A. Melo et al. 770
	<i>Bromelia karatas</i> L.	Herb	B.S. Amorim 786
	<i>Canistrum aurantiacum</i> E. Morr.	Herb	J.R. Maciel et al. 1912
	<i>Canistrum pickelii</i> (A. Lima & L.B. Sm.) Leme & J.A. Siqueira	Herb	J.R. Maciel et al. 1927
	<i>Catopsis berteroniana</i> (Schult. & Schult. f.) Mez	Herb	J.A. Siqueira-Filho 1008
	<i>Cryptanthus diana</i> Leme	Herb	B.S. Amorim et al. 1609
	<i>Guzmania lingulata</i> (L.) Mez	Herb	A. Viana 330
	<i>Guzmania monostachia</i> (L.) Rusby ex Mez.	Herb	J.A. Siqueira-Filho 2750
	<i>Hohenbergia cf. catingae</i> Ule	Herb	J.A. Siqueira-Filho 1198
	<i>Hohenbergia ramageana</i> Mez	Herb	E. Pessoa and A. Melo 477
	<i>Hohenbergia ridleyi</i> (Baker) Mez	Herb	J.A. Siqueira-Filho 691
	<i>Lymania smithii</i> R.W. Read	Herb	B.S. Amorim et al. 894
	<i>Neoregelia pernambucana</i> Leme & J.A. Siqueira	Herb	J.A. Siqueira 1000
	<i>Orthophytum disjunctum</i> L. B. Sm.	Herb	B.S. Amorim et al. 787
	<i>Pseudananas sagenarius</i> (Arruda) Camargo	Herb	J.A. Siqueira-Filho and M.J.A. Campelo 743
	<i>Racinaea spiculosa</i> (Griseb.) M.A. Spencer & L.B. Sm.	Herb	B.S. Amorim et al. 982
	<i>Tillandsia bulbosa</i> Hook. f.	Herb	B.S. Amorim et al. 959
	<i>Tillandsia gardneri</i> Lindl.	Herb	J.A. Siqueira-Filho 746
	<i>Tillandsia tenuifolia</i> L.	Herb	J.A. Siqueira-Filho 977
	<i>Tillandsia usneoides</i> (L.) L.	Herb	E. Pessoa and A. Melo 454
	<i>Vriesea cf. atra</i> Mez	Herb	E. Pessoa et al. 510
	<i>Vriesea barbosae</i> J.A. Siqueira & Leme	Herb	J.A. Siqueira-Filho 1207
	<i>Vriesea ensiformis</i> (Vell.) Beer	Herb	J.A. Siqueira-Filho 1011
	<i>Vriesea flammea</i> L.B. Sm.	Herb	J.A. Siqueira-Filho 973
	<i>Vriesea freicanecana</i> J.A. Siqueira & Leme	Herb	E. Pessoa et al. 495
	<i>Vriesea gigantea</i> Gaudich.	Herb	J.A. Siqueira-Filho 1240
	<i>Vriesea procera</i> (Mart. ex Schult. & Schult. f.) Wittm.	Herb	J.A. Siqueira-Filho 821
	<i>Vriesea tijuca</i> E. Pereira	Herb	J.A. Siqueira-Filho 740
	<i>Vriesea wawraea</i> Antoine	Herb	J.A. Siqueira-Filho 1010
Burmanniaceae (Aline Melo)			
	<i>Burmattia capitata</i> (Walter ex J.F.Gmel.) Mart.	Herb	A. Melo et al. 640
	<i>Campylosiphon purpurascens</i> Benth.	Herb	A. Melo et al. 1129
	<i>Gymnosiphon divaricatus</i> (Benth.) Benth. & Hook. f.	Herb	A. Melo et al. 470
Burseraceae (Aline Melo and Ricardo Perdiz)			
	<i>Protium aracouchini</i> (Aubl.) Marchand	Tree	B.S. Amorim et al. 1747
	<i>Tetragastris cf. catuaba</i> Soares da Cunha	Tree	G.A. Gomes-Costa et al. 181
Cactaceae (Bruno S. Amorim)			
	<i>Epiphyllum phyllanthus</i> (L.) Haw	Herb	E. Pessoa et al. 511
	<i>Rhipsalis cereuscula</i> Haw.	Herb	B.S. Amorim et al. 1606
Campanulaceae (André Amorim)			
	<i>Centropogon cornutus</i> (L.) Druce	Herb	E. Pessoa and A. Melo 459

Continued

Table 1. Continued.

Family	Species	Habit	Voucher
	<i>Lobelia xalapensis</i> Kunth	Herb	J.L. Viana et al. 327
Cannabaceae (Bruno S. Amorim)			
	<i>Trema micrantha</i> (L.) Blume	Tree	B.S. Amorim et al. 1239
Caricaceae (Bruno S. Amorim)			
	<i>Jacaratia spinosa</i> (Aubl.) A. DC.	Tree	B.S. Amorim et al. 953
Caryophyllaceae (James L. Costa-Lima)			
	<i>Drymaria cordata</i> (L.) Willd. ex Roem. & Schult.	Herb	J.L. Costa-Lima et al. 707
Celastraceae (Bruno S. Amorim)			
	<i>Maytenus distichophylla</i> Mart. ex Reissek	Tree	B.S. Amorim et al. 940
Chrysobalanaceae (Bruno S. Amorim)			
	<i>Couepia impressa</i> Prance	Tree	B.S. Amorim et al. 1779
Clusiaceae (Aline Melo and Katarina Pinheiro)			
	<i>Clusia nemorosa</i> G. Mey.	Tree	E. Pessoa and A. Melo 484
	<i>Symphonia globulifera</i> L. f.	Tree	D. Araújo et al. 1937
	<i>Tovomita mangle</i> G. Mariz	Tree	A. Melo et al. 708
Combretaceae (Aline Melo)			
	<i>Buchenavia tetraphylla</i> (Aubl.) R.A. Howard	Tree	J.L. Costa-Lima et al. 740
Commelinaceae (Roxana Barreto)			
	<i>Callisia repens</i> L.	Herb	E. Pessoa et al. 1292
	<i>Commelina diffusa</i> Burm. f.	Herb	J.L. Viana et al. 286
	<i>Commelina rufipes</i> Seub	Herb	J.L. Viana et al. 283
	<i>Dichorisandra hexandra</i> (Aubl.) Kuntze ex Hand.-Mazz.	Herb	J.L. Viana et al. 293
	<i>Dichorisandra thyrsiflora</i> J.C. Mikan	Herb	J.L. Viana & E.O. Machado 305
	<i>Gibasis geniculata</i> (Jacq.) Rohweder	Herb	J.L. Viana et al. 91
Connaraceae (Bruno S. Amorim)			
	<i>Connarus blanchetii</i> Planch.	Woody climber	A. Melo et al. 760
Convolvulaceae (Maria T. Buril)			
	<i>Ipomoea bahiensis</i> Willd. ex Roem. & Schult.	Herbaceous climber	B.S. Amorim et al. 965
	<i>Ipomoea hederifolia</i> L.	Herbaceous climber	A. Viana et al. 509
	<i>Ipomoea indica</i> (Burm.) Merr.	Herbaceous climber	D. Araújo et al. 2395
	<i>Ipomoea philomega</i> (Vell.) House	Herbaceous climber	B.S. Amorim et al. 970
	<i>Ipomoea setosa</i> Ker Gawl.	Herbaceous climber	B.S. Amorim et al. 1078
	<i>Ipomoea tiliacea</i> (Willd.) Choisy	Herbaceous climber	M.T. Buril et al. 622
	<i>Jacquemontia bifida</i> Hallier	Herbaceous climber	B.S. Amorim et al. 1036
	<i>Jacquemontia sphaerostigma</i> (Cav.) Rusby	Herbaceous climber	B.S. Amorim et al. 1298
	<i>Merremia aegyptia</i> (L.) Urb.	Herbaceous climber	S.O. Santos et al. 291
	<i>Merremia macrocalyx</i> (Ruiz & Pav.) O'Donell	Herbaceous climber	A. Melo et al. 602
Costaceae (Aline Melo)			
	<i>Costus spiralis</i> (Jacq.) Roscoe	Herb	A. Melo et al. 771
Cucurbitaceae (Diogo Araújo and Géssica Gomes-Costa)			
	<i>Cayaponia tayuya</i> (Vell.) Cogn.	Herbaceous climber	G.A. Gomes-Costa et al. 208
	<i>Fevillea trilobata</i> L.	Herbaceous climber	A.M. Miranda et al. 1450
	<i>Gurania bignoniacea</i> (Poepp. & Endl.) C. Jeffrey	Herbaceous climber	A. Melo et al. 648
	<i>Gurania lobata</i> (L.) Pruski	Herbaceous climber	A. Melo et al. 762
	<i>Gurania subumbellata</i> (Miq.) Cogn.	Herbaceous climber	G.A. Gomes-Costa et al. 179
	<i>Momordica charantia</i> L.	Herbaceous climber	B.S. Amorim et al. 925
	<i>Psiguria triphylla</i> (Miq.) C. Jeffrey	Herbaceous climber	G.A. Gomes-Costa et al. 198
Cyclanthaceae (Katarina Pinheiro)			
	<i>Asplundia gardnerii</i> (Hook) Harling	Herb	D. Araújo et al. 1784
Cyperaceae (Marccus Alves and William W. Thomas)			
	<i>Becquerelia cymosa</i> Brongn.	Herb	D. Araújo et al. 1722
	<i>Bulbostylis scabra</i> (J. Presl & C. Presl) C.B. Clarke	Herb	A. Melo et al. 658b
	<i>Cyperus distans</i> L.	Herb	A. Melo et al. 616
	<i>Cyperus haspan</i> Rottb.	Herb	D. Araújo et al. 2371
	<i>Cyperus laxus</i> Lam.	Herb	D. Araújo et al. 1774
	<i>Cyperus luzulae</i> (L.) Retz	Herb	D. Araújo et al. 1882
	<i>Cyperus odoratus</i> L.	Herb	S. Martins et al. 239
	<i>Cyperus surinamensis</i> Rottb.	Herb	J.R. Maciel et al. 1996
	<i>Eleocharis flavescens</i> (Poir.) Urb.	Herb	A. Melo et al. 665
	<i>Eleocharis intersticta</i> (Vahl) Roem & Schult.	Herb	J.R. Maciel et al. 2004
	<i>Eleocharis minima</i> Kunth	Herb	J.L. Costa-Lima et al. 855
	<i>Fimbristylis autumnalis</i> (L.) Roem. & Schult.	Herb	A. Melo et al. 617
	<i>Fimbristylis complanata</i> (Retz.) Link	Herb	J.R. Maciel et al. 1993
	<i>Fimbristylis miliacea</i> (L.) Vahl.	Herb	J.L. Costa-Lima et al. 854

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Table 1. Continued.

Family	Species	Habit	Voucher
	<i>Fuirena umbellata</i> Rottb.	Herb	D. Araújo et al. 2370
	<i>Hypolytrum bullatum</i> C.B. Clarke	Herb	W.W. Thomas et al. 15288
	<i>Hypolytrum schraderianum</i> Nees	Herb	G.A. Gomes-Costa et al. 211
	<i>Kyllinga odorata</i> Vahl	Herb	A. Melo et al. 614
	<i>Kyllinga squamulata</i> Thonn. ex Vahl	Herb	J.R. Maciel et al. 2001
	<i>Lipocarpa salzmänniana</i> Steud.	Herb	A. Melo et al. 621
	<i>Pycreus polystachyos</i> (Rottb.) P. Beauv.	Herb	J.R. Maciel et al. 2003
	<i>Rhynchospora cephalotes</i> (L.) Vahl	Herb	A. Melo et al. 664
	<i>Rhynchospora ciliata</i> Kük.	Herb	A. Melo et al. 615
	<i>Rhynchospora emaciata</i> (Nees) Boeckeler	Herb	A. Melo et al. 658
	<i>Rhynchospora exaltata</i> Kunth	Herb	D. Araújo et al. 1738
	<i>Rhynchospora nervosa</i> (Vahl) Boeckeler	Herb	J.L. Viana et al. 300
	<i>Rhynchospora pubera</i> (Vahl) Boek.	Herb	J.R. Maciel et al. 2000
	<i>Rhynchospora radicans</i> (Schltdl. & Cham.) H. Pfeiff.	Herb	J.L. Viana et al. 299
	<i>Scleria bracteata</i> Cav.	Herb	W.W. Thomas et al. 15306
	<i>Scleria distans</i> Poir.	Herb	A.C. Araújo et al. 1767
	<i>Scleria hirtella</i> Sw.	Herb	D. Araújo et al. 1740
	<i>Scleria latifolia</i> Sw.	Herb	A. Melo et al. 458
	<i>Scleria mitis</i> P.J.Bergius	Herb	A.C. Araújo et al. 1765
	<i>Scleria secans</i> (L.) Urb.	Herb	E. Pessoa and A. Melo 441
Dilleniaceae (Diogo Araújo)			
	<i>Davilla angustifolia</i> A. St.-Hil.	Woody climber	D. Araújo et al. 2438
	<i>Davilla nitida</i> (Vahl) Kubitzki	Woody climber	A. Melo et al. 703
	<i>Davilla</i> cf. <i>villosa</i> Eichler	Woody climber	B.S. Amorim et al. 937
Dioscoreaceae (Diogo Araújo)			
	<i>Dioscorea</i> aff. <i>altissima</i> Lam.	Herbaceous climber	B.S. Amorim et al. 1826 (sterile)
	<i>Dioscorea</i> aff. <i>cynanchifolia</i> Griseb.	Herbaceous climber	B.S. Amorim et al. 1770
	<i>Dioscorea dodecaneura</i> Vell.	Herbaceous climber	D. Araújo et al. 1768
	<i>Dioscorea</i> cf. <i>marginata</i> Griseb.	Herbaceous climber	B.S. Amorim et al. 1086 (sterile)
	<i>Dioscorea orthogoneura</i> Uline ex Hochr.	Herbaceous climber	B.S. Amorim et al. 1745 (sterile)
	<i>Dioscorea piperifolia</i> Humb. & Bonpl. ex Willd.	Herbaceous climber	A. Melo et al. 1209
	<i>Dioscorea sinuata</i> Vell.	Herbaceous climber	B.S. Amorim et al. 1742 (sterile)
	<i>Dioscorea stegelmänniana</i> R. Knuth	Herbaceous climber	D. Araújo et al. 1760
	<i>Dioscorea trifida</i> L.f.	Herbaceous climber	D.S. Correia et al. 89
Eleocarpaceae (Bruno S. Amorim)			
	<i>Sloanea guianensis</i> (Aubl.) Benth.	Tree	B.S. Amorim et al. 893
Eriocaulaceae (Aline Melo)			
	<i>Paepalanthus myocephalus</i> (Mart.) Körn.	Herb	J.L. Viana et al. 65
	<i>Paepalanthus tortilis</i> (Bong.) Mart.	Herb	A. Melo et al. 618
	<i>Tonina fluviatilis</i> Aubl.	Herb	A. Melo et al. 666
Erythroxylaceae (Iracema Loliola and James L. Costa-Lima)			
	<i>Erythroxylum citrifolium</i> A. St. Hill.	Tree	J.L. Costa-Lima et al. 875
	<i>Erythroxylum mucronatum</i> Benth.	Tree	J.L. Costa-Lima et al. 690
	<i>Erythroxylum squamatum</i> Sw.	Tree	A. Melo et al. 754
	<i>Erythroxylum umbrosum</i> Costa-Lima & M. Alves	Tree	A. Melo et al. 1206
	<i>Erythroxylum vacciniifolium</i> Mart.	Tree	J.L. Costa-Lima et al. 750
Euphorbiaceae (Maria F. Araújo and Bruno S. Amorim)			
	<i>Aparisthium cordatum</i> (A. Juss.) Baill.	Tree	B.S. Amorim et al. 1758
	<i>Astraea lobata</i> (L.) Klotzsch	Herb	J.L. Viana et al. 329
	<i>Cnidoscolus</i> cf. <i>urens</i> (L.) Arthur	Herb	B.S. Amorim et al. 796
	<i>Croton echinoides</i> Baill.	Shrub	D.S. Correia et al. 64
	<i>Croton floribundus</i> Spreng	Shrub	D.S. Correia et al. 138
	<i>Croton tricolor</i> Klotzsch ex Baill.	Shrub	B. S. Amorim et al. 910
	<i>Croton triqueter</i> Lam.	Subshrub	B.S. Amorim et al. 1283
	<i>Dalechampia ficifolia</i> Lam.	Woody climber	B.S. Amorim et al. 775
	<i>Dalechampia pernambucensis</i> Baill.	Woody climber	B.S. Amorim et al. 797
	<i>Euphorbia comosa</i> L.	Herb	B.S. Amorim et al. 963
	<i>Euphorbia hyssopifolia</i> L.	Herb	A. Melo et al. 613
	<i>Euphorbia insulana</i> Vell.	Herb	B.S. Amorim et al. 964
	<i>Mabea piriri</i> Aubl.	Tree	G.A. Gomes-Costa et al. 191
	<i>Microstachys corniculata</i> (Vahl) Griseb.	Subshrub	B.S. Amorim et al. 827
	<i>Pausandra morisiana</i> (Casar.) Radlk.	Tree	B.S. Amorim et al. 1273
	<i>Romanoa tamnoides</i> (A. Juss.) Radcl.-Sm.	Herbaceous climber	E. Pessoa et al. 443
	<i>Sapium glandulosum</i> (L.) Morong	Tree	A.M. Miranda and L. Félix 1602
	<i>Senefeldera verticillata</i> (Vell.) Croizat.	Tree	A. Melo et al. 700

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Table 1. Continued.

Family	Species	Habit	Voucher
Fabaceae (Rubens Queiroz, Maria T. Buril, Aline Melo, Diogo Araújo and Rosália C. Duarte)			
Caesalpinoideae			
	<i>Bauhinia acreana</i> Harms.	Tree	B.S. Amorim et al. 1780
	<i>Bauhinia cf. forficata</i> Link.	Tree	B.S. Amorim et al. 1279
	<i>Cassia grandis</i> L. f.	Tree	B.S. Amorim et al. 1301
	<i>Chamaecrista desvauxii</i> (Collad.) Killip.	Subshrub	J.A. Siqueira-Filho 964
	<i>Chamaecrista duartei</i> (H.S.Irwin) H.S. Irwin & Barneby	Tree	B.S. Amorim et al. 1752
	<i>Chamaecrista duckeana</i> (P. Bezerra & Afr. Fern.) H.S. Irwin & Barneby	Subshrub	D.S. Correia et al. 86
	<i>Dialium guianense</i> (Aubl.) Sandwith	Tree	D.S. Correia et al. 85
	<i>Phanera outimouta</i> (Aubl.) L.P. Queiroz	Woody climber	A. Melo et al. 688
	<i>Senna aversiflora</i> (Herb.) H.S. Irwin & Barneby	Shrub	M.T. Buril et al. 637
	<i>Senna georgica</i> H.S. Irwin & Barneby	Tree	A. Melo et al. 646
	<i>Senna macranthera</i> (DC. ex Collad.) H.S. Irwin & Barneby	Tree	B.S. Amorim et al. 1233
	<i>Senna quinquangulata</i> (Rich.) H.S. Irwin & Barneby	Tree	D.S. Correia et al. 131
Mimosoideae			
	<i>Albizia pedicellaris</i> (DC.) L. Rico	Tree	E. Pessoa and A. Melo 482
	<i>Enterolobium contortisiliquum</i> (Vell.) Morong	Tree	B.S. Amorim et al. 1300
	<i>Inga edulis</i> Mart	Tree	B.S. Amorim et al. 1066
	<i>Inga marginata</i> Will.	Tree	B.S. Amorim et al. 1270
	<i>Inga striata</i> Benth.	Tree	A. Melo et al. 585
	<i>Inga thibaudiana</i> DC.	Tree	B.S. Amorim et al. 1299
	<i>Mimosa ceratonia</i> L.	Tree	A. Melo et al. 605
	<i>Mimosa pudica</i> L.	Herb	A. Melo et al. 610
	<i>Mimosa sensitiva</i> L.	Subshrub	A. Melo et al. 609
	<i>Parkia pendula</i> (Willd.) Walp.	Tree	B.S. Amorim et al. 1843
	<i>Stryphnodendron pulcherrimum</i> (Willd.) Hochr.	Tree	D. Araújo et al. 1759
Papilionoideae			
	<i>Aeschynomene cf. elegans</i> Schlttdl. & Cham.	Herb	A. Melo et al. 611
	<i>Ancistrotropis peduncularis</i> (Kunth) A. Delgado	Woody climber	J.A. Siqueira-Filho 818
	<i>Andira fraxinifolia</i> Benth	Tree	B.S. Amorim et al. 1750
	<i>Bowdichia virgilioides</i> Kunth	Tree	B.S. Amorim et al. 1247
	<i>Calopogonium caeruleum</i> (Benth.) C. Wright	Herbaceous climber	B.S. Amorim et al. 1244
	<i>Canavalia brasiliensis</i> Mart. ex Benth.	Subshrub	A. Melo et al. 570
	<i>Canavalia dictyota</i> Piper	Subshrub	A. Melo et al. 681
	<i>Centrosema brasilianum</i> (L.) Benth.	Herbaceous climber	D. Araújo et al. 1876
	<i>Clitoria falcata</i> Lam.	Woody climber	A. Melo et al. 647
	<i>Crotalaria incana</i> L.	Shrub	M.T. Buril et al. 631
	<i>Crotalaria stipularia</i> Desv.	Herb-Subshrub	J.L. Viana et al. 142
	<i>Desmodium barbatum</i> (L.) Benth.	Subshrub	D.S. Correia et al. 122
	<i>Desmodium incanum</i> (Sw.) DC.	Herb	B.S. Amorim et al. 1052
	<i>Desmodium triflorum</i> (L.) DC.	Herb	D. Cavalcanti et al. 683
	<i>Desmodium cf. uncinatum</i> (Jacq.) DC.	Herb	A. Melo et al. 681
	<i>Dioclea glabra</i> Benth	Woody climber	J.L. Viana et al. 416
	<i>Dioclea violacea</i> Mart. ex Benth.	Woody climber	B.S. Amorim et al. 1234
	<i>Dioclea wilsonii</i> Standl.	Woody climber	J.L. Viana et al. 501
	<i>Machaerium hirtum</i> (Vell.) Steffeld	Tree	A. Melo et al. 699
	<i>Machaerium salzmännii</i> Benth.	Tree	D.S. Correia et al. 95
	<i>Macroptilium bracteatum</i> (Nees & C. Mart.) Maréchal & Baudet	Herbaceous climber	B.S. Amorim et al. 1304
	<i>Mucuna urens</i> (L.) Medik	Woody climber	D. Araújo et al. 1943
	<i>Pterocarpus rohri</i> Vahl.	Tree	B.S. Amorim et al. 1749
	<i>Rhynchosia phaseoloides</i> (Sw.) DC.	Woody climber	A. Melo et al. 694
	<i>Vigna lasiocarpa</i> (Mart.ex Benth.) Verdc.	Woody climber	D. Araújo et al. 1918
	<i>Zornia latifolia</i> Sm.	Herb	E. Pessoa et al. 497
Gentianaceae (Aline Melo)			
	<i>Chelonanthus purpurascens</i> (Aubl.) Struwe & V.A. Albert	Herb	A. Melo et al. 566
	<i>Coutoubea spicata</i> Aubl.	Subshrub	A. Melo et al. 633
	<i>Voyria flavescens</i> Griseb.	Herb	A. Melo et al. 469
	<i>Voyria tenella</i> Hook.	Herb	A. Melo et al. 462
Gesneriaceae (Aline Melo)			
	<i>Codonanthesis uleana</i> (Fritsch) Chautems & Mat. Perret	Subshrub	J.L. Costa-Lima et al. 874
	<i>Columnea sanguinea</i> Rich & Juss. ex DC.	Herb	M.T. Buril et al. 624
	<i>Drymonia coccinea</i> (Aubl.) Wiehler	Subshrub	B.S. Amorim et al. 879
	<i>Gloxinia perennis</i> (L.) Fritsch	Herb	J.L. Costa-Lima et al. 731
	<i>Nematanthus albus</i> Chautems	Subshrub	J.A. Siqueira-Filho et al. 1097

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Table 1. Continued.

Family	Species	Habit	Voucher
	<i>Paliavana tenuiflora</i> Mansf.	Shrub	A. Melo et al. 445
	<i>Sinningia nordestina</i> Chautems, Baracho & J.A. Siqueira	Herb	A. Melo et al. 574
	<i>Sinningia barbata</i> (Nees & Mart.) G. Nicholson	Herb	J.A. Siqueira-Filho 930
Heliconiaceae (Aline Melo, Bruno S. Amorim and Edley Pessoa)			
	<i>Heliconia pendula</i> Wawra	Herb	J.A. Siqueira-Filho 914
	<i>Heliconia psittacorum</i> L.f.	Herb	A. Melo et al. 596
	<i>Heliconia spathocircinata</i> Aristeg.	Herb	A. Melo et al. 698
Humiriaceae (Aline Melo)			
	<i>Sacoglottis mattogrossensis</i> Malme	Tree	S.O. Santos et al. 282
Hydrocharitaceae (Marccus Alves)			
	<i>Apalanthe granatensis</i> (Bonpl.) Planch.	Herb	M.L. Bazante et al. 109
Hydroleaceae (Suzana N. Moreira)			
	<i>Hydrolea spinosa</i> L.	Subshrub	B.S. Amorim et al. 1756
Hypericaceae (Bruno S. Amorim)			
	<i>Vismia guianensis</i> (Aubl.) Choisy	Tree	B.S. Amorim et al. 1243
Hypoxidaceae (Marccus Alves)			
	<i>Hypoxis decumbens</i> L.	Herb	A. Melo et al. 642
Iridaceae (Marccus Alves and Aline Melo)			
	<i>Cipura paludosa</i> Aubl.	Herb	J.L. Costa-Lima et al. 743
	<i>Eleutherine bulbosa</i> (Mill.) Urb.	Herb	J.L. Costa-Lima et al. 732
	<i>Neomarica humilis</i> (Klatt) Capell.	Herb	A. Melo et al. 1221
Lacistemataceae (Aline Melo)			
	<i>Lacistema robustum</i> Schnizl.	Tree	A. Melo et al. 751
Lamiaceae (Maria F. Agra)			
	<i>Aegiphila</i> cf. <i>racemosa</i> Vell.	Subshrub	E.D. Mendonça et al. 70
	<i>Mesosphaerum pectinatum</i> (L.) Kuntze	Herb - Subshrub	J.L. Viana et al. 70
	<i>Hyptis sidifolium</i> (L'Hérit.) Harley & J.F.B. Pastore	Herb	J.L. Viana et al. 205
Lauraceae (Suellen O. Santos)			
	<i>Aniba firmula</i> (Nees & Mart.) Mez	Tree	D.S. Correia et al. 79
	<i>Cinnamomum triplinerve</i> (Ruiz & Pav.) Kosterm.	Tree	E.D. Mendonça et al. 52
	<i>Nectandra cuspidata</i> Nees	Tree	S.O. Santos et al. 290
	<i>Ocotea glauca</i> (Nees & Mart.) Mez	Tree	B.S. Amorim et al. 1278
	<i>Ocotea glomerata</i> (Nees) Mez	Tree	S.O. Santos et al. 168
	<i>Ocotea longifolia</i> Kunth	Tree	S.O. Santos et al. 170
	<i>Ocotea puberula</i> (Rich.) Nees	Tree	S.O. Santos et al. 169
Lecythidaceae (Bruno S. Amorim)			
	<i>Eschweilera ovata</i> (Cambess.) Mart. ex Miers	Tree	B.S. Amorim et al. 1260
	<i>Lecythis lurida</i> (Miers) S.A. Mori	Tree	J.A. Siqueira-Filho 1194
	<i>Lecythis pisonis</i> Cambess.	Tree	B.S. Amorim et al. 1775
Lentibulariaceae (Aline Melo)			
	<i>Utricularia pusilla</i> Vahl	Herb	A. Melo et al. 464
	<i>Utricularia</i> cf. <i>subulata</i> L.	Herb	J.L. Costa-Lima et al. 864
Linderniaceae (Jéssica L. Viana)			
	<i>Lindernia dubia</i> (L.) Pennell	Herb	J.L. Viana et al. 320
	<i>Torenia thouarsii</i> (Cham. & Schltdl.) Kuntze	Herb	J.L. Costa-Lima et al. 862
Loganiaceae (H. Alcantara and Bruno S. Amorim)			
	<i>Spigelia flemmingiana</i> Cham. & Schltdl.	Subshrub	E. Pessoa et al. 518
	<i>Strychnos atlantica</i> Krukoff & Barneby	Woody climber	B.S. Amorim et al. 895
Loranthaceae (Bruno S. Amorim)			
	<i>Passovia pyrifolia</i> (Kunth) Tiegh.	Shrub	A. Melo et al. 696
	<i>Struthanthus</i> cf. <i>concinus</i> (Mart.) Mart.	Shrub	B.S. Amorim et al. 1089
Lythraceae (Jéssica L. Viana)			
	<i>Cuphea campestris</i> Koehne	Subshrub	A. Melo et al. 567
	<i>Cuphea carthagenensis</i> (Jacq.) J. Macbr.	Subshrub	B.S. Amorim et al. 905
	<i>Cuphea micrantha</i> Kunth	Subshrub	J.L. Viana et al. 200
	<i>Cuphea racemosa</i> (L. f.) Spreng.	Subshrub	A. Melo et al. 590
Malpighiaceae (André Amorim)			
	<i>Banisteriopsis muricata</i> (Cav.) Cuatrec.	Woody climber	D. Araújo et al. 1914
	<i>Byrsonima sericea</i> DC.	Tree	A. Melo et al. 650
	<i>Byrsonima stipulacea</i> A. Juss.	Shrub	B.S. Amorim et al. 914
	<i>Heteropterys cordifolia</i> Moric. ex A. Juss.	Woody climber	G.A. Gomes-Costa et al. 186
	<i>Heteropterys nordestina</i> Amorim	Woody climber	B.S. Amorim et al. 951
	<i>Stigmaphyllon blanchetii</i> C.E. Anderson	Woody climber	S.O. Santos et al. 272
	<i>Tetrapteryx phlonoides</i> (Spreng.) Nied.	Woody climber	B.S. Amorim et al. 1753

Continued

Table 1. Continued.

Family	Species	Habit	Voucher
Malvaceae (Bruno S. Amorim)			
	<i>Apeiba tibourbou</i> Aubl.	Tree	B.S. Amorim et al. 909
	<i>Eriotheca macrophylla</i> (K. Schum.) A. Robins	Tree	B.S. Amorim et al. 880
	<i>Gossypium barbadense</i> L.*	Shrub	B.S. Amorim et al. 765
	<i>Helicteres ovata</i> Lam.	Shrub-Tree	A. Viana et al. 486
	<i>Luehea paniculata</i> Mart. & Zucc.	Shrub	B.S. Amorim et al. 908
	<i>Pachira aquatica</i> Aubl.	Tree	B.S. Amorim et al. 1751
	<i>Pavonia malacophylla</i> (Link & Otto) Garcke	Shrub	M.A. Chagas et al. 3
	<i>Quararibea turbinata</i> (Sw.) Poir.	Tree	A. Viana 508
	<i>Sida glomerata</i> Cav.	Subshrub	B.S. Amorim et al. 924
	<i>Sida linifolia</i> Cav.	Subshrub	B.S. Amorim et al. 776
	<i>Sida rhombifolia</i> L.	Subshrub	B.S. Amorim et al. 923
	<i>Sida spinosa</i> L.	Subshrub	B.S. Amorim et al. 790
	<i>Sida urens</i> L.	Subshrub	A. Melo et al. 604
	<i>Sidastrum paniculatum</i> (L.) Fryxell	Subshrub	B.S. Amorim et al. 1240
	<i>Triumfetta althaeoides</i> Lam.	Shrub	A. Melo et al. 542
	<i>Waltheria indica</i> L.	Subshrub	B.S. Amorim et al. 1743
	<i>Wissadula amplissima</i> (L.) R.E. Fr.	Subshrub	B.S. Amorim et al. 1294
Marantaceae (Edlley Pessoa, Jéssica L. Viana and Katarina Pinheiro)			
	<i>Ctenanthe casupoides</i> Petersen	Herb	J.L. Viana et al. 264
	<i>Ctenanthe compressa</i> (A. Dietr.) Eichler	Herb	D. Araújo et al. 2396
	<i>Ctenanthe glabra</i> (Körn.) Eichler	Herb	J.L. Viana et al. 104
	<i>Goepertia sellowii</i> (Körn.) Borchs. & S. Suárez	Herb	D.S. Correia et al. 72
	<i>Goepertia umbrosa</i> (Körn.) Borchs. & S. Suárez	Herb	E. Pessoa et al. 492
	<i>Ichnosiphon gracilis</i> (Rudge) Körn.	Herb	D. Araújo et al. 2391
	<i>Maranta aff. anderssoniana</i> Yosh.-Arns et al.	Herb	N.K. Luna et al. 127
	<i>Maranta cristata</i> Nees & Mart.	Herb	E.D. Mendonça et al. 69
	<i>Maranta divaricata</i> Roscoe	Herb	E. Pessoa and A. Melo 456
	<i>Maranta noctiflora</i> Regel & Körn.	Herb	A. Melo et al. 777
	<i>Monotagma plurispicatum</i> (Körn.) K.Schum.	Herb	A. Melo et al. 645
	<i>Stromanthe tonckat</i> (Aubl.) Eichler	Herb	B.S. Amorim et al. 935
Marcgraviaceae (Bruno S. Amorim)			
	<i>Souroubea guianensis</i> Aubl.	Woody climber	B.S. Amorim et al. 1292
Mayacaceae (James L. Costa-Lima)			
	<i>Mayaca fluviatilis</i> Aubl.	Herb	J.L. Costa-Lima et al. 861
Melastomataceae (Earl Chagas, Cinthia M.L. Araújo and Aline Melo)			
	<i>Aciotis rubricaulis</i> (Mart. ex DC.) Triana	Herb	A. Melo et al. 649
	<i>Acisanthera hedyotideia</i> (K. Presl) Triana	Herb	G.A. Gomes-Costa et al. 222
	<i>Bertolonia marmorata</i> (Naudin) Naudin	Herb	E. Pessoa et al. 524
	<i>Clidemia capitellata</i> (Bonpl.) D. Don	Shrub	S.O. Santos et al. 176
	<i>Clidemia debilis</i> Crueg.	Shrub	J.B.S. Oliveira et al. 221
	<i>Clidemia hirta</i> (L.) D. Don	Shrub	A. Melo et al. 577
	<i>Clidemia urceolata</i> DC.	Shrub	A. Melo et al. 624
	<i>Henriettea succosa</i> (Aubl.) DC.	Tree	A. Melo et al. 773
	<i>Huberia consimilis</i> Baumgratz	Tree	A. Melo et al. 668
	<i>Leandra rufescens</i> (DC.) Cogn.	Shrub	A. Melo et al. 594
	<i>Miconia affinis</i> DC.	Shrub-Tree	E.C.O. Chagas Mota 10275
	<i>Miconia albicans</i> (Sw.) Steud.	Shrub-Tree	E.C.O. Chagas Mota 8411
	<i>Miconia calvescens</i> DC.	Tree	S.O. Santos et al. 190
	<i>Miconia caudigera</i> DC.	Shrub-Tree	E.C.O. Chagas Mota 8357
	<i>Miconia ciliata</i> (Rich.) DC.	Shrub	E.C.O. Chagas Mota 8465
	<i>Miconia dodecandra</i> Cogn.	Shrub-Tree	J.B.S. Oliveira et al. 222
	<i>Miconia hypoleuca</i> (Benth.) Triana	Tree	M.A. Chagas et al. 08
	<i>Miconia lepidota</i> DC.	Tree	A. Melo et al. 774
	<i>Miconia minutiflora</i> (Bonpl.) DC.	Shrub	S.O. Santos et al. 191
	<i>Miconia mirabilis</i> (Aubl.) L.O. Williams	Tree	A. Melo et al. 575
	<i>Miconia nordestina</i> R. Goldenb. & E. Chagas	Shrub-Tree	E. Chagas-Mota 10276
	<i>Miconia nervosa</i> (Sm.) Triana	Shrub	A. Melo et al. 448
	<i>Miconia prasina</i> (Sw.) DC.	Shrub-Tree	M.R. Barbosa 3325
	<i>Miconia pusilliflora</i> (DC.) Naudin	Shrub-Tree	J.L. Viana et al. 343
	<i>Pterolepis glomerata</i> (Rottb.) Miq.	Subshrub	A. Melo et al. 653
	<i>Pterolepis polygonoides</i> Triana	Subshrub	J.A. Siqueira-Filho 1114
	<i>Pterolepis trichotoma</i> (Rotb.) Cogn.	Herb	J.L. Viana et al. 324
	<i>Tibouchina fissinervia</i> Cogn.	Tree	A. Melo et al. 449
	<i>Tibouchina heteromalla</i> (D. Don) Cogn.	Shrub	A. Melo et al. 591

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Table 1. Continued.

Family	Species	Habit	Voucher
Meliaceae (Bruno S. Amorim)			
	<i>Guarea macrophylla</i> Vahl	Tree	B.S. Amorim et al. 1082
Menispermaceae (Bruno S. Amorim)			
	<i>Cissampelos andromorpha</i> DC.	Woody climber	G.A. Gomes-Costa et al. 200
	<i>Hyperbaena domingensis</i> (DC.) Benth	Woody climber	B.S. Amorim et al. 788
	<i>Orthomene schomburgkii</i> (Miers) Barneby & Krukoff	Woody climber	B.S. Amorim et al. 1582
Menyanthaceae (Diogo Araújo)			
	<i>Nymphoides indica</i> (L.) Kuntze	Herb	B.S. Amorim et al. 1093
Monimiaceae (Diogo Araújo)			
	<i>Mollinedia ovata</i> Ruiz & Pav.	Tree	A. Melo et al. 753
Moraceae (Aline Melo and Bruno S. Amorim)			
	<i>Dorstenia bahiensis</i> Klotzsch ex Fisch. & C.A.Mey.	Herb	A. Melo et al. 702
	<i>Ficus cf. calyptróceras</i> (Miq.) Miq.	Tree	D. Araújo et al. 1783
	<i>Helicostylis tomentosa</i> (Poepp. & Endl.) Rusby	Tree	B.S. Amorim et al. 1847
Myristicaceae (Bruno S. Amorim)			
	<i>Viola gardneri</i> (A.DC.) Warb	Tree	A. Melo et al. 755
Myrtaceae (Bruno S. Amorim)			
	<i>Campomanesia aromatica</i> (Aubl.) Griseb.	Tree	B.S. Amorim et al. 1567
	<i>Campomanesia dichotoma</i> (O. Berg) Mattos	Tree	E. Pessoa et al. 444
	<i>Campomanesia xanthocarpa</i> (Mart.) Berg.	Tree	B.S. Amorim et al. 1857
	<i>Eugenia astringens</i> Cambess.	Shrub	B.S. Amorim et al. 1988
	<i>Eugenia cf. candolleana</i> DC.	Tree	B.S. Amorim et al. 1280 (sterile)
	<i>Eugenia culicina</i> Sobral	Tree	B.S. Amorim et al. 1782
	<i>Eugenia excelsa</i> O. Berg	Tree	B.S. Amorim et al. 800
	<i>Eugenia ligustrina</i> (Sw.) Willd.	Tree	B.S. Amorim et al. 1840
	<i>Eugenia pyriformis</i> Cambess.	Tree	B.S. Amorim et al. 1851
	<i>Eugenia submontana</i> B.S. Amorim & M. Alves	Tree	B.S. Amorim et al. 1080
	<i>Eugenia tumescens</i> B.S. Amorim & M. Alves	Tree	B.S. Amorim et al. 1783
	<i>Eugenia umbrosa</i> O. Berg	Tree	B.S. Amorim et al. 1757
	<i>Myrcia amplexicaulis</i> (Vell.) Hook. f.	Tree	B.S. Amorim et al. 817
	<i>Myrcia spectabilis</i> DC.	Tree	B.S. Amorim et al. 768
	<i>Myrcia splendens</i> (Sw.) DC.	Tree	B.S. Amorim et al. 1781
	<i>Myrcia sylvatica</i> (G. Mey) DC.	Tree	A. Melo et al. 685
	<i>Myrcia tenuivenosa</i> Kiaersk.	Tree	B.S. Amorim et al. 945
	<i>Myrcia tomentosa</i> (Aubl.) DC.	Tree	B.S. Amorim et al. 771
	<i>Psidium guajava</i> L.	Tree	B.S. Amorim et al. 1250
	<i>Psidium guineense</i> Sw.	Tree	B.S. Amorim et al. 770
	<i>Syzygium cumini</i> (L.) Skeels*	Tree	B.S. Amorim et al. 815
Nyctaginaceae (Aline Melo)			
	<i>Guapira opposita</i> (Vell.) Reitz	Tree	A. Melo et al. 756
Ochnaceae (Fernanda Silva)			
	<i>Ouratea crassa</i> Tiegh.	Tree	B.S. Amorim et al. 793
	<i>Sauvagesia erecta</i> L.	Subshrub	A. Melo et al. 607
Olacaceae (Bruno S. Amorim)			
	<i>Cathedra rubricaulis</i> Miers	Shrub-Tree	B.S. Amorim et al. 792
Onagraceae (Bruno S. Amorim)			
	<i>Ludwigia hyssopifolia</i> (G. Don) Exell	Herb	E. Pessoa et al. 471
Orchidaceae (Edlley Pessoa)			
	<i>Acianthera glumacea</i> (Lindl.) Pridgeon & M.W. Chase	Herb	E. Pessoa et al. 520
	<i>Acianthera hygrophila</i> (Barb. Rodr.) Pridgeon & M.W. Chase	Herb	E. Pessoa et al. 954
	<i>Anathallis barbulata</i> (Lindl.) Pridgeon & M.W. Chase	Herb	E. Pessoa et al. 521
	<i>Anathallis sclerophylla</i> (Lindl.) Prodgeon & M.W. Chase	Herb	E. Pessoa et al. 959
	<i>Aspidogyne argentea</i> (Vell.) Garay	Herb	E. Pessoa et al. 427
	<i>Aspidogyne foliosa</i> (Poepp. Endl.) Garay	Herb	E. Pessoa et al. 416
	<i>Brassavola tuberculata</i> Hook.	Herb	J.A. Siqueira-Filho 985
	<i>Camaridium carinatum</i> (Barb. Rodr.) Hoehne	Herb	E. Pessoa et al. 931
	<i>Camaridium micranthum</i> M.A. Blanco	Herb	E. Pessoa et al. 928
	<i>Campylocentrum crassirhizum</i> Hoehne	Herb	E. Pessoa and A. Melo 470
	<i>Campylocentrum micranthum</i> (Lindl.) Rolfe	Herb	E. Pessoa et al. 1062
	<i>Campylocentrum pernambucense</i> Hoehne	Herb	E. Pessoa and A. Melo 429
	<i>Campylocentrum robustum</i> Cogn.	Herb	M.T. Buril et al. 645
	<i>Campylocentrum serranum</i> E. Pessoa & M. Alves	Herb	E. Pessoa et al. 1051
	<i>Cattleya granulosa</i> Lindl.	Herb	E. Pessoa et al. 941

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Table 1. Continued.

Family	Species	Habit	Voucher
	<i>Cattleya labiata</i> Lindl.	Herb	E. Pessoa et al. 500
	<i>Comparettia barkeri</i> (Lindl.) M.W. Chase & N.H. Williams	Herb	E. Pessoa and A. Melo 450
	<i>Cyrtopodium flavum</i> Link & Otto ex Rchb.	Herb	E. Pessoa and A. Melo 434
	<i>Dichaea panamensis</i> Lindl.	Herb	E. Pessoa and A. Melo 419
	<i>Dichaea pendula</i> (Aubl.) Cogn.	Herb	E. Pessoa et al. 958
	<i>Dimerandra emarginata</i> (G. Mey.) Hoehne	Herb	E. Pessoa and A. Melo 460
	<i>Elleanthus linifolius</i> C. Presl.	Herb	J.A. Siqueira-Filho 1015
	<i>Encyclia oncioides</i> (Lindl.) Schltr.	Herb	E. Pessoa et al. 1291
	<i>Epidendrum anatipedium</i> L.M. Sánchez & Hágsater	Herb	E. Pessoa et al. 935
	<i>Epidendrum campaccii</i> Hágsater & L. Sánchez	Herb	E. Pessoa et al. 937
	<i>Epidendrum carpophorum</i> Barb. Rodr.	Herb	E. Pessoa et al. 1048
	<i>Epidendrum cinnabarinum</i> Salzm. ex Lindl.	Herb	E. Pessoa and A. Melo 436
	<i>Epidendrum macrocarpum</i> Rich.	Herb	A. Melo et al. 588
	<i>Epidendrum proligerum</i> Barb. Rodr.	Herb	J.G. Gomes s.n. (UFP 6889)
	<i>Epidendrum ramosum</i> Jacq.	Herb	E. Pessoa and A. Melo 414
	<i>Epidendrum rigidum</i> Jacq.	Herb	E. Pessoa and A. Melo 417
	<i>Epidendrum strobiliferum</i> Rchb. f.	Herb	E. Pessoa and A. Melo 420
	<i>Epidendrum sanchezii</i> E. Pessoa & L. P. Félix	Herb	E. Pessoa et al. 1056
	<i>Epidendrum tridactylum</i> Lindl.	Herb	E. Pessoa et al. 951
	<i>Eurystyles cotyledon</i> Wawra	Herb	E. Pessoa et al. 955
	<i>Gomesa barbata</i> (Lindl.) M.W. Chase & N.H. Williams	Herb	E. Pessoa and A. Melo 415
	<i>Gomesa loefgrenii</i> (Cogn.) M.W. Chase & N.H. Williams	Herb	J.A. Siqueira-Filho 1180
	<i>Gongora vitorinoana</i> Chiron & L.C. Menezes	Herb	E. Pessoa et al. 1040
	<i>Habenaria cryptophila</i> Barb. Rodr.	Herb	A. Melo et al. 1197
	<i>Habenaria petalodes</i> Lindl.	Herb	M.A. Chagas et al. 19
	<i>Habenaria pratensis</i> (Lindl.) Rchb. f.	Herb	M.A. Chagas et al. 20
	<i>Habenaria trifida</i> Kunth.	Herb	J.L. Viana et al. 295
	<i>Heterotaxis discolor</i> (Lodd. ex Lindl.) Ojeda & Carnevali	Herb	E. Pessoa et al. 926
	<i>Isochilus linearis</i> (Jacq.) R. Br.	Herb	E. Pessoa et al. 538
	<i>Jacquinella globosa</i> (Jacq.) Schltr.	Herb	E. Pessoa and A. Melo 423
	<i>Jacquinella teretifolia</i> (Sw.) Britton & Wilson	Herb	E. Pessoa et al. 1053
	<i>Lepanthopsis floripecten</i> (Rchb. f.) Ames	Herb	E. Pessoa et al. 1049
	<i>Liparis nervosa</i> (Thumb.) Lindl.	Herb	J.A. Siqueira-Filho 1085
	<i>Malaxis excavata</i> (Lindl.) Kuntze	Herb	J.L. Viana et al. 307
	<i>Mapinguari desvauxianus</i> (Rchb. f.) Carnevali & R.B. Singer	Herb	E. Pessoa et al. 930
	<i>Maxillaria leucaeimata</i> Barb. Rodr.	Herb	E. Pessoa et al. 1054
	<i>Maxillaria ochroleuca</i> Lodd. ex Lindl.	Herb	E. Pessoa et al. 927
	<i>Mesadenella cuspidata</i> (Lindl.) Garay	Herb	E. Pessoa et al. 957
	<i>Mormolyca rufescens</i> (Lindl.) M.A. Blanco	Herb	E. Pessoa et al. 547
	<i>Myoxanthus exasperatus</i> (Lindl.) Luer	Herb	E. Pessoa et al. 1042
	<i>Nitidobulbon nasutum</i> (Rchb. f.) I. Ojeda & Carnevali	Herb	J.A. Siqueira-Filho 984
	<i>Notylia inversa</i> Barb. Rodr.	Herb	E. Pessoa and A. Melo 480
	<i>Octomeria alexandri</i> Schltr.	Herb	E. Pessoa et al. 1065
	<i>Oeceoclades maculata</i> (Lindl.) Lindl.	Herb	G.A. Gomes-Costa et al. 194
	<i>Pabstiella lingua</i> (Lindl.) Luer	Herb	E. Pessoa et al. 943
	<i>Phragmipedium sargentianum</i> Rolfe	Herb	E. Pessoa and A. Melo 435
	<i>Pleurothallis pruinosa</i> Lindl.	Herb	E. Pessoa et al. 546
	<i>Pleurothallis ruscifolia</i> (Jacq.) R. Br.	Herb	E. Pessoa et al. 1057
	<i>Polystachya estrellensis</i> Rchb. f.	Herb	E. Pessoa and A. Melo 418
	<i>Prescottia oligantha</i> (Sw.) Lindl.	Herb	E. Pessoa and A. Melo 433
	<i>Prescottia plantaginifolia</i> Lindl. ex Hook.	Herb	J.A. Siqueira-Filho 1176
	<i>Prosthechea alagoensis</i> (Pabst) W.E. Higgins	Herb	E. Pessoa et al. 504
	<i>Prosthechea pygmaea</i> (Hook.) W.E. Higgins	Herb	E. Pessoa and A. Melo 425
	<i>Prosthechea vespa</i> (Vell.) W.E. Higgins	Herb	B.S. Amorim et al. 1087
	<i>Psilochilus modestus</i> Barb. Ro	Herb	J.L. Viana et al. 121
	<i>Rhetinantha notylioglossa</i> (Rchb. f.) M.A. Blanco	Herb	E. Pessoa et al. 525
	<i>Rodriguezia bahiensis</i> Rchb. f.	Herb	E. Pessoa et al. 508
	<i>Sacoila lanceolata</i> (Aubl.) Garay	Herb	E. Pessoa et al. 1041
	<i>Scaphyglottis fusiformis</i> (Griseb.) Schultes	Herb	E. Pessoa and A. Melo 422
	<i>Scaphyglottis modesta</i> (Rchb. f.) Schltr.	Herb	E. Pessoa and A. Melo 481
	<i>Scaphyglottis sickii</i> Pabst	Herb	E. Pessoa et al. 517
	<i>Sobralia liliastrum</i> Salzm. ex Lindl.	Herb	E. Pessoa and A. Melo 432
	<i>Specklinia integripetala</i> E. Pessoa & F. Barros	Herb	E. Pessoa and A. Melo 428
	<i>Stelis aprica</i> Lindl.	Herb	E. Pessoa et al. 545

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Table 1. Continued.

Family	Species	Habit	Voucher
	<i>Stelis deregularis</i> Barb. Rodr.	Herb	B.S. Amorim et al. 1126
	<i>Stelis loefgrenii</i> Cogn.	Herb	E. Pessoa et al. 548
	<i>Trichocentrum fuscum</i> Lindl.	Herb	E. Pessoa et al. 956
	<i>Vanilla cf. mexicana</i> Mill.	Herb	E. Pessoa et al. 1060
	<i>Vanilla pompona</i> Schiede	Herb	E. Pessoa et al. 499
	<i>Zygostates bradei</i> (Schltr.) Garay	Herb	E. Pessoa and A. Melo 431
	<i>Wulfschlaegelia aphylla</i> (Sw.) Rchb. f.	Herb	E. Pessoa et al. 1285
Orobanchaceae (Bruno S. Amorim)			
	<i>Melasma melampyroides</i> (Rich.) Pennell	Subshrub	J.L. Viana et al. 73
Oxalidaceae (James L. Costa-Lima)			
	<i>Oxalis corniculata</i> L.	Herb	J.L. Costa-Lima et al. 706
	<i>Oxalis cratensis</i> Oliv. ex Hook.	Herb	D. Araújo et al. 1940
	<i>Oxalis umbraticola</i> A. St. Hill	Herb	D.S. Correia et al. 76
Passifloraceae (Diogo Araújo)			
	<i>Passiflora capsularis</i> L.	Woody climber	D. Araújo et al. 1941
	<i>Passiflora circinnata</i> Mast.	Woody climber	D. Araújo et al. 16
	<i>Passiflora contracta</i> Vitta	Woody climber	D. Araújo et al. 1762
	<i>Passiflora edulis</i> Sims	Woody climber	B.S. Amorim et al. 1734
	<i>Passiflora foetida</i> L.	Woody climber	G.A. Gomes-Costa et al. 217
	<i>Passiflora mansoi</i> (Mart.) Mast.	Woody climber	B.S. Amorim et al. 955
	<i>Passiflora misera</i> Kunth	Woody climber	D. Araújo et al. 1772
	<i>Passiflora rubra</i> L.	Woody climber	J.A. Siqueira-Filho 787/711 (UFP 21406)
	<i>Passiflora silvestris</i> Vell.	Woody climber	S.O. Santos et al. 187
	<i>Passiflora suberosa</i> L.	Woody climber	D. Araújo et al. 1718
	<i>Passiflora watsoniana</i> Mast	Woody climber	B.S. Amorim et al. 791
Peraceae (Marccus Alves)			
	<i>Chaetocarpus myrsinites</i> Baill.	Tree	B.S. Amorim et al. 1079
Phyllanthaceae (Bruno S. Amorim)			
	<i>Hieronyma oblonga</i> (Tul.) Müll. Arg.	Tree	B.S. Amorim et al. 1748
	<i>Phyllanthus gradyi</i> M.S. Silva & M.F. Sales	Tree	A. Melo et al. 772
Phytolaccaceae (Aline Melo)			
	<i>Phytolacca thyrsoflora</i> Fenzl ex J.A. Schmidt	Herb	S.O. Santos et al. 306
Picramniaceae (Katarina Pinheiro)			
	<i>Picramnia gardneri</i> Planch.	Shrub	A. Melo et al. 454
Piperaceae (Aline Melo and Daniele Monteiro)			
	<i>Peperomia cf. elongata</i> Kunth.	Herb	D. Araújo et al. 2420
	<i>Peperomia glabella</i> (Sw.) Dietr.	Herb	A. Melo et al. 766
	<i>Peperomia increscens</i> Miq.**	Herb	J.L. Costa-Lima et al. 701
	<i>Peperomia magnoliifolia</i> (Jacq.) A. Dietr.	Herb	A. Melo et al. 752
	<i>Peperomia obtusifolia</i> (L.) A. Dietr.	Herb	J.L. Costa-Lima et al. 876
	<i>Peperomia pseudoestrellensis</i> C. DC.	Herb	D. Araújo et al. 1750
	<i>Peperomia rotundifolia</i> (L.) Kunth	Herb	A. Melo et al. 764
	<i>Piper amplum</i> Kunth	Shrub	A. Melo et al. 782
	<i>Piper anisum</i> (Spreng.) Angely	Shrub	B.S. Amorim et al. 1059
	<i>Piper arboreum</i> Aubl.	Shrub	B.S. Amorim et al. 1253
	<i>Piper caldense</i> C. DC.	Shrub	A. Melo et al. 592
	<i>Piper cernuum</i> Vell.	Shrub	A. Melo et al. 672
	<i>Piper hispidum</i> Sw.	Shrub	A. Melo et al. 579
	<i>Piper limai</i> Yuck.	Shrub	A. Melo et al. 686
	<i>Piper marginatum</i> Jacq.	Shrub	A. Melo et al. 580
	<i>Piper mollicomum</i> Kunth	Shrub	A. Melo et al. 778
	<i>Piper umbellatum</i> L.	Herb	B.S. Amorim et al. 1246
Plantaginaceae (Jéssica L. Viana and Bruno S. Amorim)			
	<i>Achetaria scutellarioides</i> (Benth.) Wettst.	Herb-Shrub	J.L. Viana et al. 162
	<i>Angelonia biflora</i> Benth	Herb-Subshrub	J.L. Viana et al. 281
	<i>Angelonia salicariifolia</i> Bonpl.	Herb-Subshrub	A. Melo et al. 634
	<i>Bacopa stricta</i> (Schrad.) Wettst. ex Edwall	Herb	J.L. Viana et al. 290
	<i>Stemodia foliosa</i> Benth	Herb-Shrub	J.L. Viana et al. 204
	<i>Stemodia verticillata</i> (Mill.) Hassl	Herb	J.L. Viana et al. 321
Poaceae (Jefferson R. Maciel)			
	<i>Andropogon bicornis</i> L.	Herb	J.L. Viana et al. 332
	<i>Andropogon cf. leucostachyus</i> Kunth	Herb	D. Araújo et al. 2380
	<i>Axonopus capillaris</i> (Lam.) Chase	Herb	J.R. Maciel et al. 1917
	<i>Cenchrus purpureus</i> (Schumach.) Morrone	Herb	G.A. Gomes-Costa et al. 212

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Table 1. Continued.

Family	Species	Habit	Voucher
Polygalaceae (Débora Cavalcanti)	<i>Chusquea</i> cf. <i>capituliflora</i> Trin.	Herb	B.S. Amorim et al. 1584
	<i>Chusquea</i> aff. <i>urelytra</i> Hack	Herb	D. Araújo et al. 1767
	<i>Dichantherium assurgens</i> (Renvoize) Zuloaga	Herb	J.L. Viana et al. 255
	<i>Dichantherium sciurotis</i> (Trin.) Davidse	Herb	A. Melo et al. 583
	<i>Digitaria fuscescens</i> (J. Presl) Henrard	Herb	B.S. Amorim et al. 1076
	<i>Digitaria tenuis</i> (Nees) Henrard	Herb	J.R. Maciel et al. 1922
	<i>Enteropogon mollis</i> (Nees) Clayton	Herb	J.R. Maciel et al. 1921
	<i>Eragrostis maypurensis</i> (Kunth) Steud.	Herb	J.R. Maciel et al. 1920
	<i>Eragrostis</i> cf. <i>rufescens</i> Schrad. ex Schult.	Herb	D. Araújo et al. 1723
	<i>Ichnanthus calvescens</i> Nees	Herb	J.L. Viana et al. 135
	<i>Ichnanthus dasycoleus</i> Tutin	Herb	B.S. Amorim et al. 1064
	<i>Ichnanthus leiocarpus</i> (Spreng.) Kunth	Herb	B.S. Amorim et al. 820
	<i>Ichnanthus grandiflorus</i> (Döll) Zuloaga & Soderstr.	Herb	J.R. Maciel et al. 1906
	<i>Ichnanthus nemoralis</i> (Schrad. ex Schult.) Hitchc. & Chase	Herb	J.L. Viana et al. 262
	<i>Ichnanthus tenuis</i> (J. Presl & C. Presl) Hitchc. & Chase	Herb	B.S. Amorim et al. 1075
	<i>Imperata brasiliensis</i> Trin.	Herb	D. Araújo et al. 2441
	<i>Lasiacis divaricata</i> (L.) Hitchc.	Herb	B.S. Amorim et al. 1049
	<i>Lasiacis sorghoidea</i> (Desv. ex Ham.) Hitchc. & Chase	Herb	J.L. Viana et al. 106
	<i>Merostachys neesii</i> Rupr.	Herb	J.R. Maciel et al. 1928
	<i>Olyra latifolia</i> L.	Herb	E. Pessoa and A. Melo 455
	<i>Oplismenus hirtellus</i> (L.) P.Beauv.	Herb	E. Pessoa and A. Melo 453
	<i>Parodiolyra micrantha</i> (Kunth) Davidse & Zuloaga	Herb	B.S. Amorim et al. 1072
	<i>Paspalum arenarium</i> Schrad	Herb	J.R. Maciel et al. 1923
	<i>Paspalum convexum</i> Humb. & Bonpl. ex Fluggé	Herb	J.R. Maciel et al. 1919
	<i>Paspalum maritimum</i> Trin.	Herb	J.R. Maciel et al. 1924
	<i>Paspalum nutans</i> Lam.	Herb	J.R. Maciel et al. 1930
	<i>Paspalum paniculatum</i> L.	Herb	D. Araújo et al. 1917
	<i>Pharus parvifolius</i> Nash	Herb	J.R. Maciel et al. 1907
	<i>Rugolosa pilosa</i> (Sw.) Zuloaga	Herb	B.S. Amorim et al. 821
	<i>Setaria sulcata</i> Raddi	Herb	B.S. Amorim et al. 933
	<i>Setaria vulpiseta</i> (Lam.) Roem. & Schult.	Herb	J.L. Viana et al. 279
	<i>Sporobolus monandrus</i> Roseng., B.R. Arrill. & Izag.	Herb	J.R. Maciel et al. 1918
	<i>Steinchisma laxum</i> (Sw.) Zuloaga	Herb	D. Araújo et al. 2369
	<i>Streptochaeta spicata</i> Schrad ex Nees	Herb	J.L. Viana et al. 341
	<i>Trichanthecium parvifolium</i> (Lam.) Zuloaga & Morrone	Herb	D. Araújo et al. 2373
	<i>Urochloa plantaginea</i> (Link) R.D. Webster	Herb	B.S. Amorim et al. 826
Polygalaceae (Débora Cavalcanti)	<i>Asemeia violacea</i> (Aubl.) J.F.B. Pastore & J.R. Abbott	Herb	B.S. Amorim et al. 1599
	<i>Polygala paniculata</i> L.	Herb	A. Melo et al. 444
Polygonaceae (Juan García-González and Bruno S. Amorim)	<i>Coccoloba parimensis</i> Benth.	Woody climber	B.S. Amorim et al. 813
	<i>Coccoloba striata</i> Benth.	Woody climber	B.S. Amorim et al. 941
Portulacaceae (Bruno S. Amorim)	<i>Portulaca hirsutissima</i> Cambess.	Herb	A. Melo et al. 746
	<i>Talinum paniculatum</i> (Jacq.) Gaertn.	Herb	A. Viana 521
Primulaceae (Katarina Pinheiro and Aline Melo)	<i>Lysimachia ovalis</i> (Ruiz & Pav.) U. Manns & Anderb.	Herb	D. Araújo et al. 1724
	<i>Myrsine guianensis</i> (Aubl.) Kuntze	Tree	D. Araújo et al. 1894
	<i>Myrsine</i> cf. <i>umbellata</i> Mart.	Tree	M. Chagas et al. 26
Proteaceae (Bruno S. Amorim)	<i>Roupala montana</i> Aubl.	Tree	B.S. Amorim et al. 1276
Quiinaceae (Marccus Alves)	<i>Quiina cruegeriana</i> Griseb.	Tree	D. Araújo et al. 2443
Ranunculaceae (Jéssica L. Viana)	<i>Clematis dioica</i> L.	Woody climber	J.L. Viana et al. 189
Rhamnaceae (Diogo Araújo)	<i>Gouania blanchetiana</i> Miq.	Woody climber	D. Araújo et al. 1929
Rosaceae (James L. Costa-Lima)	<i>Rubus brasiliensis</i> Mart.	Shrub	J.L. Costa-Lima 744
Rubiaceae (Jomar Jardim, Maria C. Pessoa and Maria S. Pereira)	<i>Amaioua intermedia</i> Mart. ex Schult. & Schult. f.	Shrub	J.L. Costa-Lima et al. 729
	<i>Borreria decipiens</i> K. Schum.	Subshrub	M.A. Chagas et al. 22
	<i>Borreria humifusa</i> Mart.	Herb	G.A. Gomes-Costa et al. 185
	<i>Borreria latifolia</i> (Aubl.) K. Schum.	Herb-Subshrub	J.L. Viana et al. 317

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Table 1. Continued.

Family	Species	Habit	Voucher
	<i>Borreria ocymifolia</i> (Roem. & Schult.) Bacigalupo & E.L. Cabral	Herb	B.S. Amorim et al. 897
	<i>Borreria scabiosoides</i> Cham. & Schtdl.	Herb-Subshrub	J.L. Viana et al. 308
	<i>Borreria verticillata</i> (L.) G. Mey.	Subshrub	G.A. Gomes-Costa et al. 209
	<i>Chiococca alba</i> (L.) Hitchc	Shrub	A. Melo et al. 1200
	<i>Chomelia pedunculosa</i> Benth.	Shrub	B.S. Amorim et al. 1269
	<i>Coccocypselum cordifolium</i> Nees & Mart.	Herb	A. Melo et al. 1222
	<i>Coccocypselum lanceolatum</i> (Ruiz & Pav.) Pers.	Herb	A. Melo et al. 704
	<i>Coussarea nodosa</i> (Benth.) Müll. Arg.	Shrub	D.S. Correia et al. 91
	<i>Coutarea hexandra</i> (Jacq.) K. Schum.	Shrub	A. Melo et al. 635
	<i>Emmeorhiza umbellata</i> (Spreng.) K. Schum.	Herbaceous climber	D. Araújo et al. 1781
	<i>Faramea multiflora</i> A. Rich	Shrub	B.S. Amorim et al. 929
	<i>Geophila repens</i> (L.) I.M. Johnst.	Herb	J.L. Viana et al. 261
	<i>Gonzalagunia dicocca</i> Cham. & Schltdl.	Shrub	B.S. Amorim et al. 1077
	<i>Guettarda viburnoides</i> Cham. & Schltdl.	Tree	M. Chagas et al. 02
	<i>Margaritopsis cephalantha</i> (Müll.Arg.) C.M. Taylor	Shrub	M.T. Buril et al. 641
	<i>Palicourea blanchetiana</i> Schltdl.	Shrub	D.S. Correia et al. 93
	<i>Palicourea marcgravii</i> A. St-Hil	Shrub	A. Melo et al. 581
	<i>Posoqueria cf. acutifolia</i> Mart.	Shrub	A. Melo et al. 1132
	<i>Posoqueria longiflora</i> Aubl.	Shrub	D.S. Correia et al. 90
	<i>Psychotria bahiensis</i> DC.	Shrub	S.O. Santos et al. 181
	<i>Psychotria bracteocardia</i> (DC.) Mull. Arg.	Shrub	E. Pessoa and A. Melo 463
	<i>Psychotria capitata</i> Ruiz & Pav.	Shrub	W.W. Thomas 15292
	<i>Psychotria carthagenensis</i> Jacq.	Shrub	J.B.S. Oliveira 63
	<i>Psychotria cupularis</i> (Müll. Arg.) Standl.	Shrub	A. Viana & J.B.S. Oliveira 97
	<i>Psychotria deflexa</i> DC.	Shrub	S.O. Santos et al. 297
	<i>Psychotria hoffmannseggiana</i> (Willd. ex Schult.) Müll. Arg.	Shrub	E. Pessoa et al. 513
	<i>Psychotria aff. leiocarpa</i> Cham. & Schltdl	Shrub	B.S. Amorim et al. 896
	<i>Psychotria platypoda</i> DC.	Shrub	B.S. Amorim et al. 892
	<i>Psychotria racemosa</i> Rich.	Shrub	B.S. Amorim et al. 883
	<i>Psychotria schlechtendaliana</i> (Müll. Arg.) Müll. Arg.	Shrub	D.S. Correia et al. 109
	<i>Psychotria vellosiana</i> Benth.	Shrub	D. Araújo et al. 1752
	<i>Ronabea latifolia</i> Aubl.	Shrub	E. Pessoa and A. Melo 430
	<i>Sabicea grisea</i> Cham. & Schltdl	Shrub	D. Araújo et al. 1910
	<i>Staelia virgata</i> (Link ex Roem. & Schult.) K. Schum.	Herb	J.L. Costa Lima et al. 852
Rutaceae (Bruno S. Amorim and Aline Melo)			
	<i>Conchocarpus cf. heterophyllus</i> (A. St.-Hil.) Kallunki & Pirani	Tree	B.S. Amorim et al. 878
	<i>Conchocarpus longifolius</i> (A. St.-Hil.) Kallunki & Pirani	Tree	D.S. Correia et al. 107
	<i>Hortia brasiliana</i> Vand. ex DC.	Tree	A. Melo et al. 705
	<i>Zantoxylum rhoifolium</i> Lam.	Tree	A. Melo et al. 1192
Salicaceae (Aline Melo)			
	<i>Casearia javitensis</i> H.B.K.	Tree	B.S. Amorim 1754
	<i>Casearia sylvestris</i> Sw.	Tree	A. Melo et al. 697
	<i>Xylosma ciliatifolia</i> (Clos) Eichler	Tree	T. Leão 906
Santalaceae (Bruno S. Amorim)			
	<i>Phoradendron cf. crassifolium</i> (Pohl ex DC.) Eichler	Shrub	A. Melo et al. 695
	<i>Phoradendron mucronatum</i> (DC.) Krug & Urb.	Shrub	M.L. Bazante et al. 87
Sapindaceae (Luiz A. Pereira, Diogo Araújo and Bruno S. Amorim)			
	<i>Allophylus puberulus</i> (Cambess.) Radlk.	Tree	M.A. Chagas et al. 13
	<i>Allophylus racemosus</i> Sw.	Tree	D.S. Correia et al. 67
	<i>Cupania impressinervia</i> Acerv.-Ro	Tree	A. Melo et al. 692
	<i>Cupania racemosa</i> (Vell.) Radlk.	Tree	B.S. Amorim et al. 1242
	<i>Dilodendron bipinatum</i> Radlk.	Tree	J.A. Siquira-Filho et al. 1051
	<i>Paullinia carpopoda</i> Cambess.	Woody climber	B.S. Amorim et al. 889
	<i>Paullinia micrantha</i> Cambess.	Woody climber	B.S. Amorim et al. 916
	<i>Paullinia racemosa</i> Wawra	Woody climber	D.S. Correia et al. 133
	<i>Paullinia weinmanniifolia</i> Mart.	Woody climber	D.S. Correia et al. 113
	<i>Serjania glabrata</i> Kunth	Woody climber	E.D. Mendonça et al. 62
	<i>Serjania salzmänniana</i> Schltdl.	Woody climber	B.S. Amorim et al. 1237
	<i>Talisia esculenta</i> (Cambess.) Radlk.	Tree	B.S. Amorim et al. 1291
	<i>Talisia retusa</i> R.S. Cowan	Tree	E.D. Mendonça et al. 65
Sapotaceae (Anderson Alves-Araújo)			
	<i>Chrysophyllum gonocarpum</i> (Mart. & Eichler ex Miq.) Engl.	Tree	D. Araújo et al. 1743
	<i>Chrysophyllum splendens</i> Spreng.	Tree	B.S. Amorim et al. 1773
	<i>Pouteria nordestinensis</i> Alves-Araújo & M. Alves	Tree	E. Pessoa et al. 509

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Table 1. Continued.

Family	Species	Habit	Voucher
	<i>Pradosia lactescens</i> (Vel.) Radlk.	Tree	B.S. Amorim et al. 912
Schoepfiaceae (Bruno S. Amorim)			
	<i>Schoepfia brasiliensis</i> A. DC.	Shrub	B.S. Amorim et al. 1060
Simaroubaceae (Bruno S. Amorim)			
	<i>Simarouba amara</i> Aubl.	Tree	B.S. Amorim et al. 1289
Siparunaceae (Bruno S. Amorim)			
	<i>Siparuna guianensis</i> Aubl.	Tree	J.B.S. Oliveira et al. 102
Smilacaceae (Diogo Araújo)			
	<i>Smilax syphilitica</i> Humb. & Bonpl. ex Willd.	Woody climber	E.D. Mendonça et al. 72
Solanaceae (Maria F. Agra and Valéria Sampaio)			
	<i>Aurelianea fasciculata</i> (Vell.) Sendtn.	Shrub	B.S. Amorim et al. 1071
	<i>Brunfelsia uniflora</i> (Pohl) D.Don	Shrub	B.S. Amorim et al. 1039
	<i>Cestrum axillare</i> Vell.	Shrub	A. Melo et al. 693
	<i>Cestrum sprucei</i> Francey	Shrub	D. Araújo et al. 1883
	<i>Dysochroma viridiflorum</i> (Sims) Miers	Shrub	E.D. Mendonça et al. 56
	<i>Lycianthes pauciflora</i> (Vahl) Bitter	Woody climber	B.S. Amorim et al. 1744
	<i>Physalis angulata</i> L.	Subshrub	B.S. Amorim et al. 1297
	<i>Solanum acerifolium</i> Dunal	Shrub	B.S. Amorim et al. 1255
	<i>Solanum anisocladum</i> Giacomini & Stehmann	Shrub	L.L. Giacomini et al. 1794
	<i>Solanum asperum</i> Rich	Shrub	A. Melo et al. 573
	<i>Solanum asterophorum</i> Mart.	Shrub	G.A. Gomes-Costa et al. 197
	<i>Solanum capsicoides</i> All.	Shrub	V.S. Sampaio et al. 76
	<i>Solanum decompositiflorum</i> Sendtn.	Shrub	V.S. Sampaio et al. 72
	<i>Solanum maranguapense</i> Bitter	Shrub	B.S. Amorim et al. 921
	<i>Solanum paniculatum</i> L.	Shrub	V.S. Sampaio et al. 79
	<i>Solanum paraibanum</i> Agra	Woody climber	B.S. Amorim et al. 1604
	<i>Solanum reflexiflorum</i> Moric. ex Dunal	Shrub	V.S. Sampaio et al. 71
	<i>Solanum rugosum</i> Dunal	Shrub	V.S. Sampaio et al. 77
	<i>Solanum stipulaceum</i> Willd. ex Roem. & Schult.	Shrub	V.S. Sampaio et al. 73
	<i>Solanum sycocarpum</i> Mart. & Sendtn.	Shrub	E. Pessoa et al. 478
Thymelaeaceae (Bruno S. Amorim)			
	<i>Daphnopsis racemosa</i> Griseb.	Shrub	B.S. Amorim et al. 1855
Turneraceae (Bruno S. Amorim & Andréia Zelenski)			
	<i>Piriqueta racemosa</i> (Jacq.) Sweet.	Herb	B.S. Amorim et al. 901
	<i>Turnera aff. pernambucensis</i> Urb.	Shrub	D. Araújo et al. 2375
Urticaceae (Bruno S. Amorim and Jéssica L. Viana)			
	<i>Cecropia pachystachya</i> Trécul	Tree	B.S. Amorim et al. 1094
	<i>Laportea aestuans</i> (L.) Chew	Herb	A. Melo et al. 691
	<i>Pilea hyalina</i> Fenzl	Herb	J.L. Viana et al. 289
	<i>Porouma guianensis</i> Aubl.	Tree	B.S. Amorim et al. 1763
	<i>Urera baccifera</i> (L.) Gaudich. ex Wedd.	Shrub	A. Melo et al. 455
Verbenaceae (Maria F. Agra and Jéssica L. Viana)			
	<i>Citharexylum pernambucense</i> Moldenke	Shrub	E.D. Mendonça et al. 50
	<i>Lantana camara</i> L.	Shrub	A. Melo et al. 623
	<i>Lantana radula</i> Sw.	Shrub	S.O. Santos et al. 304
Violaceae (Bruno S. Amorim)			
	<i>Amphirrhox longifolia</i> (A.St.-Hil.) Spreng.	Shrub	B.S. Amorim et al. 1837
	<i>Noisettia orchidiflora</i> (Rudge) Ging.	Herb	B.S. Amorim et al. 919
	<i>Paypayrola blanchetiana</i> Tul.	Shrub	B.S. Amorim et al. 1600
	<i>Pombalia calceolaria</i> (L.) Paula-Souza	Herb	B.S. Amorim et al. 939
	<i>Rinorea guianensis</i> Aubl.	Tree	J.L. Viana et al. 418
Vitaceae (Júlio Lombardi)			
	<i>Cissus erosa</i> Rich.	Woody climber	A. Melo et al. 745
	<i>Cissus tinctoria</i> Mart.	Woody climber	D.S. Lucena et al. 602
	<i>Cissus verticillata</i> (L.) Nicolson & C.E. Jarvis	Woody climber	A.M.M. Miranda and L.P. Félix 1566
Xyridaceae (Maria G. Wanderley)			
	<i>Xyris jupicai</i> Rich.	Herb	A. Melo et al. 662
Zingiberaceae (Jéssica L. Viana)			
	<i>Renanthera alpina</i> (Rottb.) Maas	Herb	J.L. Costa-Lima et al. 725
	<i>Renanthera guianensis</i> Maas	Herb	D. Araújo et al. 1763

Rubiaceae (20), Asteraceae (19) and Bromeliaceae (17).

The genera with the highest taxonomic diversity were *Miconia* Ruiz & Pav. and *Solanum* L. with 14 species each (corresponding to 46.7% of the species of Melastomataceae and 58.3% of Solanaceae), *Psychotria* L. with 13 species (30.9% of Rubiaceae) and *Epidendrum* L., *Eugenia* L., *Passiflora* L. and *Piper* L. with 11 species each (12.8% of Orchidaceae, 47.8% of Myrtaceae, 100% of Passifloraceae and 61.1% of Piperaceae).

The most representative structural group in the study area was “Herbs”, totaling 355 spp. (42.6% of the total species) being most terrestrial (58.6%) or epiphytes and/or hemiepiphytes (34%). Almost 60% of species classified as “Herbs” belong to the following families of Monocotyledons: Orchidaceae, Bromeliaceae, Poaceae, Cyperaceae and Araceae.

The “Bushes” category includes 194 taxa (23.3% of the total species), being most represented in terms of number of species by Rubiaceae with 34 spp. (representing 17.5% of the species in the bushes category), followed by Solanaceae with 20 (10.3%), Melastomataceae with 18 (9.3%) and Malvaceae with 15 spp. (7.7%). Followed by “Trees and related forms” with 189 spp. (22.7% of all species) and was represented by Fabaceae with 24 spp. (12.6% of the Trees and related forms group), Myrtaceae with 22 (11.6%) and Melastomataceae with 14 spp. (7.4%).

“Climbers” completes the picture with 116 spp. (14% of total species in the area), of which 34 are herbaceous (29% of the species of Climbers) and the remainder woody (71%). The group is well represented by Fabaceae and Passifloraceae with 11 spp. each (9.5% each), Convolvulaceae with 10 (8.6%), Apocynaceae with nine (7.7%), Dioscoreaceae with eight (6.9%), Cucurbitaceae with seven (6%) and Asteraceae, Malpighiaceae and Sapindaceae with six species each (5.2% each).

Considering the substrate, most species of the area are “Terrestrial” with 676 spp. (81.2% of all species) and comprise several families. The second most representative group are “epiphytic and hemiepiphytic” with 124 spp. (about 15% of the total species) and the greatest diversity among Orchidaceae (53.2% of epiphytes and hemiepiphytes), Bromeliaceae (25.8%) and Araceae (9.7%) and Piperaceae (5.6%). These are followed by the “Saxicolous” group, represented by 47 spp. (5.6% of all species), and families with the most species were Bromeliaceae (30% of saxicolous species), Orchidaceae (19.1%), Begoniaceae and Gesneriaceae (6.4% each). “Aquatic and wetland” plants are represented by 21 spp. (2.5% of total species), among which Cyperaceae has seven spp. (33.3% of aquatic and wetland species), Lentibulariaceae and Linderniaceae two species each (9.5% each) and the rest of the families have only one species.

Regarding the source of nutrition, only 13 species

(1.5% of total species) found are “hemiparasitic” or “mycoheterotrophic”; of these, eight species (61.5%) are “hemiparasitic”, belonging to the families Loranthaceae (4 spp.), Orobanchaceae (1 spp.) and Santalaceae (3 spp.), and five species (38.5%) are “mycoheterotrophic”, with representatives in Burmanniaceae and Gentianaceae (2 spp. each) and Orchidaceae (1 sp.).

About 15% of the total species of Serra do Urubu (122 spp.) are considered, according to the Lista de Espécies da Flora do Brasil (2015), as endemic to the Atlantic Forest. It is worth mentioning that Bromeliaceae (26 spp.), Orchidaceae (20 spp.), Myrtaceae (8 spp.), Solanaceae (7 spp.) and Marantaceae (5 spp.) together account for over 50% of cases. Among this same set of species, four are known only from forest remnants of the states of Bahia and Pernambuco (*Rauvolfia moricandii* A. DC., Apocynaceae; *Begonia obdeltata* Gregório & E.L. Jaques, Begoniaceae; *Heteropterys cordifolia* Moric. ex A. Juss., Malpighiaceae; and *Peperomia estrellensis* DC., Piperaceae) and 23 are considered to be restricted to the Pernambuco Endemism Center (*sensu* Prance 1987), with 10 known only from the state.

A disjunct distribution between the Amazon and Atlantic Forests has been confirmed for 10.6% of the species in the area. Among the families with this distribution pattern are Orchidaceae with 24 spp. (22.7% of the cases of disjunction), Fabaceae with seven (8%), Bromeliaceae, Melastomataceae and Piperaceae with four (4.5% each), Lecythidaceae and Violaceae with three species each (3.4% each). Some examples are the following: Lecythidaceae—*Eschweilera ovata* (Cambess.) Mart. ex Miers, *Lecythis lurida* (Miers) S.A. Mori and *L. pisonis* Cambess.; Bromeliaceae—*Aechmea mertensii* (G.Mey.) Schult. & Schult. f.; Annonaceae—*Cymbopetalum brasiliensis* (Vell.) Benth. ex Baill.; Menispermaceae—*Hyperbaena domingensis* (DC.) Benth.; and Piperaceae—*Peperomia glabella* (Sw.) Dietr.

DISCUSSION

The Serra do Urubu has the biggest taxonomic richness (832 taxa) when compared with other floristic surveys in the state of Pernambuco (Table 2) (Guedes 1998; Rodal et al. 2005a, 2005b; Rodal and Sales 2007; Sacramento et al. 2007; Ferraz and Rodal 2008; Cavalcanti 2012; Alves et al. 2013). The Serra do Urubu slightly exceeds the total number of species only an area of lowland forest in the north of the state, whose inventory has been continuously updated since 2008 and was recently updated to 830 species of angiosperms (Alves-Araújo et al. 2008; Melo et al. 2011; Alves et al. 2013).

The difference is even more striking when the data presented here are compared with floristic inventories of areas of submontane and montane forests of Pernambuco (Rodal et al. 2005b; Rodal and Sales 2007; Ferraz and Rodal 2008), even after considering the

Table 2: Comparison with other floristic surveys in the Brazilian Northeast.

Study area (state, locale)	Vegetation	Number of species / families	Most representative families	Reference
Pernambuco, Serra do Urubu	Montane Forest (600–780 m)	832 / 118	Orchidaceae (86 spp), Fabaceae (51 spp.), Rubiaceae (42 spp.), Bromeliaceae (41 spp.) and Poaceae (40 spp.)	This work
Pernambuco, Mata do Estado	Submontane / Montane Forest (200–640 m)	375 / 94	Fabaceae (34), Myrtaceae (21), Rubiaceae (20), Lauraceae and Sapindaceae (14).	Ferraz and Rodal 2008
Pernambuco, Reserva Municipal de Bonito	Submontane Forest (450–500 m)	217 / 65	Fabaceae (26), Asteraceae and Euphorbiaceae (14), Melastomataceae and Rubiaceae (13).	Rodal et al. 2005b
Pernambuco, Parque Ecológico João Vasconcelos-Sobrinho	Submontane Forest (800–950 m)	332 / 85	Fabaceae (51), Asteraceae (20), Rubiaceae (19), Solanaceae (14), Myrtaceae (13).	Rodal and Sales 2007
Pernambuco -Usina São José	Lowland Forest (60–150 m)	830 / 113	Fabaceae (87), Poaceae (54), Cyperaceae (40), Rubiaceae (34), Orchidaceae and Melastomataceae (29).	Alves et al. 2013
Paraíba, Reserva Ecológica Mata do Pau Ferro	Submontane Forest (400–600 m)	309 / 84	Fabaceae (30), Rubiaceae (24), Malvaceae (21), Solanaceae (16) and Asteraceae (14).	Vasconcelos et al. 2004
Ceará, Serra do Baturité	Submontane / Montane Forest (400–800 m)	419 / 89	Myrtaceae (52), Fabaceae (41), Euphorbiaceae (23), Rubiaceae (21), Lauraceae (13).	Araújo et al. 2007
Bahia, Serra do Corcovado	Submontane / Montane Forest (400–1040 m)	678 / 100	Orchidaceae (69), Rubiaceae (46), Bromeliaceae (33), Fabaceae (30), Melastomataceae (28).	Coelho and Amorim 2014
Bahia, Serra da Pedra Lascada	Montane Forest (600–950 m)	466 / 88	Orchidaceae (42), Rubiaceae (41), Bromeliaceae (30), Melastomataceae (27), Poaceae (23).	Coelho and Amorim 2014
Bahia, Serra das Lontras	Submontane / Montane Forest (400–1,000 m)	792 / 110	Orchidaceae (108), Bromeliaceae (62), Rubiaceae (57), Melastomataceae (45), Myrtaceae and Asteraceae (33 each).	Amorim et al. 2009; Leitman et al. 2014
Bahia, Serra Bonita	Submontane / Montane Forest (300–1,080 m)	628 / 103	Orchidaceae (52), Rubiaceae (44), Melastomataceae (37), Asteraceae (33), Poaceae (28).	Amorim et al. 2009
Bahia, Serra do Teimoso	Montane Forest (850 m)	667 / 100	Fabaceae (51), Myrtaceae (39), Rubiaceae (31), Orchidaceae (25), Sapotaceae and Solanaceae (24 each).	Amorim et al. 2005
Bahia, Reserva Biológica do Una	Lowland and Submontane Forest (100–350 m)	947 / 108	Fabaceae (71), Rubiaceae (66), Myrtaceae (59), Bromeliaceae (40) and Orchidaceae (38).	Amorim et al. 2008

size difference of fragments. For example, the region of Serra do Urubu studied here has more than twice as many species recorded in an area of the municipality of São Vicente Férrer (Ferraz and Rodal 2008), which had until now held the record for the greatest number of species for this type of vegetation in the state. The high floristic diversity of the Serra do Urubu is also reflected in other groups of plants such as ferns and lycophytes, which according to Barros et al. (2006), have more than 40% of the species cataloged for Pernambuco occurring in the PRNP Frei Caneca.

In relation to similar inventories conducted in montane forests in the Northeast, the number of recorded species is compatible with values obtained by Amorim et al. (2009), Coelho and Amorim (2014) and Leitman et al. (2014), in areas of southern Bahia (412–792 species) and which are recognized for the high diversity and high levels of endemism in their floras. In addition, the richest fragments in the studies mentioned are of sizes comparable with the fragments of the Serra do Urubu (Table 2). Nevertheless, forest fragments in southern Bahia with more than 2000 ha still have lower species richness than the Serra do Urubu (Amorim et al. 2009; Coelho and Amorim 2014; Leitman et al. 2014).

The richness of plants in the Serra do Urubu is comparable to the Una Biological Reserve, located in southern Bahia and home to a mosaic of environments consisting of submontane forest, “tabuleiro” vegetation, mangrove, flooded and disturbed areas. The Una Biological Reserve has 947 species of angiosperms

cataloged over 10 years of sampling effort. This region stands as the most species-rich area in northeastern Brazil (Amorim et al. 2008). However, excluding species that are unique to “tabuleiro” and mangroves, 737 species have been cataloged for the submontane region of Una, which makes the species richness of the Serra do Urubu and Rebio UNA comparable.

The most diverse families in number of species in the Serra do Urubu (Orchidaceae, Fabaceae, Rubiaceae, Bromeliaceae, Poaceae, Asteraceae, Melastomataceae and Solanaceae) were also the most species-rich in floristic studies of montane areas in southern Bahia, such as in the Serra do Corcovado (Coelho and Amorim 2014), Serra Bonita and Serra das Lontras (Amorim et al. 2009; Leitman et al. 2014). A similar pattern of richness was found in Una where Fabaceae, Rubiaceae, Myrtaceae, Bromeliaceae, Orchidaceae and Melastomataceae were the most species-rich families, listed in descending order.

On the other hand, in studies carried out in Pernambuco by Rodal et al. (2005b), Rodal and Sales (2007) and Ferraz and Rodal (2008), Orchidaceae was poorly sampled and represented only 3.2–1.5% of the flora, while in the Serra do Urubu Orchidaceae represents 10.3% of the total number of species recorded. A proportion similar to this has been shown for areas of Bahia, wherein Orchidaceae account for between 8.2% and 10.2% of the flora (Amorim et al. 2009; Coelho and Amorim 2014; Leitman et al. 2014). Furthermore, the richness of the family in the Serra do Urubu is among the greatest ever recorded in floristic surveys in the

Northeastern Brazil. These differences are probably due to different sampling efforts concentrated on the arboreal layer of the areas of Pernambuco. However, one cannot fail to consider the effect of fragmentation and human pressures on the species, besides the difference in the size of the fragments among the studied areas.

Fabaceae emerges at different proportions in the various studies performed in Atlantic Forest fragments, despite being one of the most representative families in montane areas of Pernambuco (Rodal et al. 2005b; Rodal and Sales 2007; Ferraz and Rodal 2008) and Bahia (Amorim et al. 2005, 2009; Coelho and Amorim 2014). In the Serra do Urubu, the family accounts for about 6.1% of total species, while in the Mata do Brejão (Rodal et al. 2005b) and the Municipal Park Vasconcelos Sobrinho (Rodal and Sales 2007), its proportion ranges from 12–15.6%. This difference is suggested here to be due to a small sampling of non-arboreal structural groups in Rodal et al. (2005b) and Rodal and Sales (2007), as observed for Orchidaceae and Cyperaceae, among other families.

It is important to point out that, for various reasons, there is a clear bias directed to the effort of collecting woody species (including trees, woody climbers and shrubs) in some studies, which usually leads to low sampling of species from other groups, such as herbaceous plants. This is evidenced in Ferraz and Rodal (2008), in which members of the woody group represented 64.5% of the recorded species. On the other hand, when the same sampling effort is performed for other strata of the forest, richness patterns emerge similar to those seen in the Serra do Urubu. Thus, in Rodal et al. (2005b) and Rodal and Sales (2007), trees represent 25% and 35.7% of the species sampled in the areas, respectively, which is close to a value found here. In addition, Fabaceae, Rubiaceae and Myrtaceae are among the most representative families in these works (Rodal et al. 2005b; Rodal and Ferraz 2007; Ferraz and Rodal 2008).

The most representative of structural groupings was “Herbs”, followed by “Bushes” and “Trees and related forms”, corroborating the findings of Amorim et al. (2009) and Coelho and Amorim (2014) in inventories in montane forests in Bahia. In both those studies, Orchidaceae is identified as the richest family in number of species, followed by Rubiaceae, Bromeliaceae, Fabaceae, Myrtaceae, Melastomataceae and Solanaceae, findings which were also found in the Serra do Urubu.

The similarities also apply to climbers. Rodal et al. (2005b), Rodal and Ferraz (2007), Ferraz and Rodal (2008), this functional group is 10–15% of the flora in their respective study areas, a pattern into which the Serra do Urubu fits nicely at 14%. The distribution of species richness of climbers into families is also similar, where Fabaceae is among the most representative together with Cucurbitaceae, Dioscoreaceae and

Sapindaceae. However, in the Serra do Urubu this group also includes Passifloraceae, Apocynaceae, Convolvulaceae, Asteraceae and Malpighiaceae.

Plants with differentiated forms of nutrition (hemiparasitic, parasitic or mycoheterotrophic) are usually represented by only a few species or absent in floristic inventories. No mycoheterotrophic species were recorded in montane and submontane areas of Pernambuco by Rodal et al. (2005b), Rodal and Ferraz (2007) and Ferraz and Rodal (2008), who recognized only hemiparasitic species of the families Loranthaceae and Santalaceae. In these works, the hemiparasites were represented by one or up to four species, while eight species have been recorded in the Serra do Urubu. Araújo et al. (2007), in the Serra do Baturité (Ceará state), also recorded hemiparasitic species of Loranthaceae and a species of Balanophoraceae (*Langsdorffia hypogaea* Mart.). Meanwhile, Barbosa et al. (2004), working in a montane forest area in Areia (Paraíba state), cataloged species of hemiparasite and mycoheterotrophy but also cited *Cuscuta racemosa* Mart. (Convolvulaceae), a parasitic species that was not recorded in other studies. In areas of southern Bahia (Amorim et al. 2005, 2008, 2009; Coelho and Amorim 2014), hemiparasites are represented with three to nine species in these same families (Loranthaceae and Santalaceae), in addition to parasitic species such as *Helosis cayennensis* (Sw.) Spreng. (Balanophoraceae) and mycoheterotrophic species (e.g., *Gymnosiphon divaricatus* (Benth.) Benth. & Hook. f. [Burmanniaceae] and *Voyria flavescens* Griseb. [Gentianaceae]). The mycoheterotrophic species recorded in this study *Campylosiphon purpurascens* Benth. (Burmanniaceae) and *Wulfschlaegelia aphylla* (Sw.) Rchb. f. (Orchidaceae) were previously known only from single records collected 40 years ago in the state of Pernambuco from other areas of montane forests in the state (Melo and Alves 2013).

The rock outcrops in the Serra do Urubu are generally at the summit of the mountain, and have been given particular names, such as Pedra do Cruzeiro, which is an access point for visitors. Some species recorded in the Serra do Urubu are restricted to these environments, among which are *Ortophytum disjunctum* L.B. Sm. (Bromeliaceae), *Paepalanthus myocephalus* Mart. ex Körn. (Eriocaulaceae), *Euphorbia comosa* L. (Euphorbiaceae) and *Sobralia liliastrum* Salzm. ex Lindl. (Orchidaceae). These species have also been recorded in other floristic surveys of rock outcrops in Pernambuco (Gomes and Alves 2010; Gomes and Sobral-Leite 2013; Pessoa and Alves 2014). Other examples are *Mandevilla dardanoi* M.F. Sales, Kin.-Gouv. & A.O. Simões (Apocynaceae), *Paliavana tenuiflora* Mansf. and *Sinningia nordestina* Chautems, Baracho & J.A. Siqueira (Gesneriaceae), which are considered restricted to areas of rock outcrops of the Borborema Plateau and its extensions (Sales et al.

2006; Gomes and Alves 2009, 2010; Araújo et al. 2015).

Our results also provide significant advances in the floristic knowledge of the region and on the distribution of species in the northern Atlantic Forest. With this list there was a considerable increase in the number of listed species from Serra do Urubu, as Cardoso et al. (2006) and Grillo et al. (2006) recorded 241 species of flowering plants in the PRNP Frei Caneca. In addition, our results improved the initial checklists of these authors with the not inclusion of 86 species because we had not been located neither the field nor herbaria. Families with the most corrections were Orchidaceae with 17 species, followed by Fabaceae with 11 and Bromeliaceae with seven. These improvements work together to enhance our knowledge of the biodiversity of the area and for future management plans of the protected area.

Based on the *Lista de Espécies da Flora do Brasil* (2015) and local floras (Sales et al. 1998; Ferraz and Rodal 2008; Almeida-Júnior et al. 2009; Gomes and Alves 2010; Amorim and Alves 2012a, 2012b, 2012c; Amorim et al. 2012; Chagas 2012; Alves et al. 2013; Buril 2013; Oliveira and Alves 2013; Sampaio 2013; Viana and Barbosa 2013; Costa-Lima 2014; Pereira 2014; Pessoa and Alves 2015b), it was found that 25 spp. (about 3% of the total cataloged for the Serra do Urubu) are new records for the state of Pernambuco. This increase to the flora of the state includes families such as Fabaceae (6 spp.), Piperaceae, Poaceae and Rubiaceae (3 spp. each) and Myrtaceae (2 spp.). These results reiterate the importance of the study of local-regional floras for increasing knowledge of plant diversity in the northern portion of the Atlantic Forest.

As to the proportion of species endemic to the Atlantic Forest, the present study found that 15% of species have this distribution pattern, which is well below that found by Coelho and Amorim (2014), who verified that more than 37% of species listed by them are endemic to this domain. Meanwhile, the proportion of species found with disjunct distributions between the Amazon and Atlantic Forest is 10%, which is similar to that found by Rodal et al. (2005b) and Coelho and Amorim (2014). Amorim et al. (2009) indicated that this value is similar to what is found in lowland areas of southern Bahia; however, they also found a decrease in this ratio with increased altitude.

The families Bromeliaceae, Orchidaceae, Myrtaceae and Marantaceae had the greatest number of species endemic to the Atlantic Forest in our results. These families are also among those with the greatest proportion of endemic species of all families recorded in this area according to Stehmann et al. (2009) and the *Lista de Espécies da Flora do Brasil* (2015). More than 88% of Bromeliaceae species present in the Atlantic Forest are endemic to this domain, followed by Myrtaceae with 77.2%, Marantaceae with 73.15%, Melastomataceae with 71%, Orchidaceae with 68.3% and Rubiaceae with 58%

(Lista de Espécies da Flora do Brasil 2015), an overall pattern of the Atlantic Forest reflected at the local level in the Serra do Urubu.

Ferraz et al. (2004) considered some species recorded here as characteristic of the montane forests of Pernambuco, among them: *Couepia impressa* Prance (Chrysobalanaceae), *Erythroxylum mucronatum* Benth. (Erythroxylaceae), *Margaritaria nobilis* L. f., *Senefeldera verticillata* (Vell.) Croizat. (Euphorbiaceae), *Myrsine guianensis* (Aubl.) Kuntze (Primulaceae), *Cinnamomum triplinerve* (Ruiz & Pav.) Kosterm. (Lauraceae), *Lecythis lurida* (Miers.) S.A. Mori (Lecythidaceae), *Hyeronima oblonga* (Tul.) Müll.Arg. (Phyllanthaceae), *Quiina cruegeriana* Griseb. (Quiinaceae), *Rubus brasiliensis* Mart. (Rosaceae), *Allophylus racemosus* Sw. (Sapindaceae), *Symplocos neglecta* Brand (Symplolacaceae) and *Urera baccifera* (L.) Gaudich. ex Wedd. (Urticaceae). However, *Cinnamomum triplinerve*, *Erythroxylum mucronatum* and *Quiina cruegeriana* are also present in lowland areas (Alves-Araújo et al. 2010; Oliveira and Alves 2013; Costa-Lima 2014) and *Myrsine guianensis* is commonly found in *restinga* plant formations of coastal Brazil (Freitas and Carrijo 2008; Almeida Jr. et al. 2009; Alves et al. 2013). Furthermore, *Hyeronima oblonga* is a species found in montane forests (Rebster and Huft 1988), as is *Symplocaceae*, which is more species-rich in the Brazilian Southeast and South (Fritsch et al. 2008; Aranha-Filho and Pedreira 2009).

Myrtaceae is usually indicated among the most species-rich families and as an important component in the tree layer (Oliveira-Filho and Fontes 2000; Amorim et al. 2008; Coelho and Amorim 2014). The number of species occurring in submontane and montane forests in relation to lowland forests is similar, but different in composition. *Eugenia hirta* O. Berg and *Myrciaria ferruginea* O. Berg are common in the understory of lowland forests of Pernambuco (Amorim and Alves 2011) but absent in submontane and montane forests, as is also the case with *Marlierea excoriata* Mart., *Myrcia bergiana* O. Berg, *Myrcia densa* (DC.) Sobral and *Psidium cattleianum* Afzel ex Sabine (Amorim and Alves 2012c). Although there are species shared by both environments, some are exclusive to submontane and montane forest in Pernambuco, such as *Eugenia culicina* Sobral, *E. submontana* B.S. Amorim & M. Alves and *Myrcia amplexicaulis* (Vell.) Hook.f. (Amorim and Alves 2012, 2015; Sobral 2013).

The presence of species occurring in montane and lowland forests reveals the transitional nature of the Serra do Urubu, which stands at the altitudinal limit adopted for characterization of submontane and montane forests. This position may be one of the factors contributing to the high species richness found in this study. Ferraz et al. (2008) found evidence that the submontane forests of the Serra da Borborema have

a transitional pattern between lowland and montane forests, following the same trend of altitudinal gradients recorded by Gentry (1988).

The high richness of some families in the Serra do Urubu and other montane and submontane forests in the Northeastern Brazil (Amorim et al. 2009; Coelho and Amorim 2014) is distinct from lowland areas. Orchidaceae and Bromeliaceae, well-sampled here and in the cited studies, have less richness in the checklists produced by Guedes (1998), Rodal et al. (2005a), Soares-Júnior et al. (2008) and Alves et al. (2013). In southeastern Brazil, according to Oliveira-Filho and Fontes (2000), the number of species of Chrysobalanaceae, Sapotaceae, Rutaceae and Moraceae tends to decrease with increasing altitude, while for Asteraceae, Melastomataceae, Primulaceae and Solanaceae the numbers tend to increase. This assertion is partially corroborated in the Serra do Urubu, where Chrysobalanaceae and Sapotaceae are poorly represented (one and three species, respectively), while in the Usina São José, a lowland forest area in northern Pernambuco state (Alves et al. 2013), six and 18 species have been cataloged, respectively. The same difference of number of species in these areas does not fully apply to Rutaceae and Moraceae (Alves et al. 2013). Primulaceae and Solanaceae are richer in Serra do Urubu than in Usina São José, partially corroborating the findings of Oliveira-Filho and Fontes (2000). Meanwhile, Asteraceae and Melastomataceae are represented by the same number of species in the two areas mentioned. Amorim et al. (2009) pointed out that Burseraceae, Combretaceae and Connaraceae are better represented in lowland areas than in montane and submontane areas of Bahia. However, comparing the floristic checklists of Usina São José (Alves et al. 2013) and Serra do Urubu, this assertion is not confirmed. It is noteworthy that some families such as Bignoniaceae and Polygalaceae are more diverse in lowland forests (Alves et al. 2013), unlike Gesneriaceae and Begoniaceae that are richer in middle and high elevation areas (Clement et al. 2004; Perret et al. 2013). Piperaceae is another example of the richness of the flora of Serra do Urubu being more pronounced in higher altitude forests than in lowland forests (Guedes 1998; Sacramento et al. 2007; Soares Jr. et al. 2008; Alves et al. 2013). In addition, some examples are representative, such as *Peperomia glabella* (Sw.) Dietr., which in the Northeast is known only from montane areas in the states of Ceará (Serra do Baturité and Maranguape) and Bahia (Serra Bonita and Serra das Lontras) (Guimarães and Giordano 2004; Amorim et al. 2009), *P. pseudoestrellensis* C. DC., which in the Northeast has been recorded only in southern Bahia (Amorim et al. 2009; Leitman et al. 2014), and *P. increscens* Miq., which occurs in higher areas in the state (Gomes and Alves 2010).

According to the *Livro Vermelho da Flora do Brasil* (2013), 10 species recorded in the area are under some degree of threat: *Phragmipedium sargentianum* Rolfe (Orchidaceae), Threatened with Extinction; *Aechmea gustavoi* J.A. Siqueira & Leme (Bromeliaceae), Critically Endangered; *Canistrum auratiacum* E. Morr., *Neoregelia pernambucana* Leme & J.A. Siqueira and *Vrisea wawraneana* Antoine (Bromeliaceae), *Campylocentrum pernambucense* Hoehne and *Octomeria alexandri* Schltr. (Orchidaceae), Endangered; and *Canistrum pickelii* (A.Lima & L.B.Sm.) Leme & J.A.Siqueira, *Guzmania monostachia* (L.) Rusby ex Mez. (Bromeliaceae), *Cattleya labiata* Lindl., *C. granulosa* Lindl. (Orchidaceae) and *Euterpe edulis* Mart. (Arecaceae), Vulnerable. Additionally, the *Lista de Espécies da Flora do Brasil* (2015) contains six species considered Near Threatened, they are: *Anthurium bromelicola* Mayo & L.P. Félix (Araceae), *Bowdichia virgiloides* Kunth. (Fabaceae), *Hortia brasiliana* Vand. ex DC. (Rutaceae), *Lacistema robustum* Schnizl. (Lacistemataceae), *Ocotea puberula* (Rich.) Nees (Lauraceae) and *Zygostates bradei* (Schltr.) Garay (Orchidaceae). Aside from *Vrisea wawraneana*, which was cataloged here only from herbarium material, the other species mentioned above were observed in their natural habitat. *Canistrum auratiacum*, *C. pickelii*, *Euterpe edulis* and *Lacistema robustum* are restricted to the understory of higher altitude areas of the Serra do Urubu. Furthermore, Giulietti et al. (2009) considered *Canistrum auratiacum*, *Neoregelia pernambucana* (Bromeliaceae), *Dichantherium assurgens* (Poaceae) and *Borreria decipiens* (Rubiaceae) as rare species.

In addition to sheltering a large contingent of endangered species, the Serra do Urubu has its relevance to conservation highlighted by the fact that it supports significant portions of biodiversity of ecologically important families of the Atlantic Forest and the flora of Pernambuco state. In this sense, the family Bromeliaceae has 17 genera and 41 species occurring in the area which represents 85% of the genera and 40% of the species recorded for Pernambuco (Forzza et al. 2015). In turn the Serra do Urubu supports 61.5% of the genera and 39% of the species of Orchidaceae occurring in the state of Pernambuco (Barros et al. 2015; Pessoa and Alves 2015b) and harbors 26.4% of all species of Myrtaceae recorded in the state. Other families of less floristic relevance also have a significant portions of their biodiversity in Pernambuco preserved in the Serra do Urubu. Such is the case with Gesneriaceae, where all genera and 80% of the species occurring in Pernambuco, Marantaceae with 42.3% of the species occurring in the state, Piperaceae with 42.8%, Melastomataceae with about 46%, Violaceae with 55.6% and Passifloraceae with 68.75% of its species in the state are recorded in the Serra do Urubu (Lista de Espécies da Flora do Brasil 2015).

Furthermore, in the last 10 years (2004–2014) more than 15 new species of angiosperms occurring in the

area have been described, some of which were found in the production of this floristic inventory (Chautems et al. 2005; Leme and Siqueira Filho 2006; Sales et al. 2006; Amorim and Alves 2012a, 2015; Costa-Lima and Alves 2013; Giacomini et al. 2013; Sobral 2013; Gregório et al. 2014; Pessoa et al. 2014a, 2014b, 2015a). Some taxa are known only from their populations in Serra do Urubu, such as *Vrisea barbosae* J.A. Siqueira & Leme, *V. freicanecana* J.A. Siqueira & Leme — Bromeliaceae (Leme and Siqueira-Filho 2006), *Eugenia submontana* B.S. Amorim & M. Alves (Amorim and Alves 2015), *Campylocentrum serranum* E. Pessoa & M. Alves and *Specklinia integripetala* E. Pessoa & F. Barros — Orchidaceae (Pessoa et al. 2014a; Pessoa and Alves 2015a) or from only a few other locations, such as *Aechmea pernambucensis* J.A. Siqueira & Leme (Leme and Siqueira-Filho 2006), *Erythroxylum umbrosum* Costa-Lima & M. Alves — Erythroxylaceae (Costa-Lima and Alves 2013), *Eugenia culucina* Sobral (Sobral 2013), *Eugenia tumescens* B.S. Amorim & M. Alves — Myrtaceae (Amorim and Alves 2012a) and *Epidendrum sanchezii* E. Pessoa & L.P. Felix — Orchidaceae (Pessoa et al. 2014b).

Conclusions

This work confirms that Serra do Urubu is an area of high relevance to the diversity of angiosperms in the Brazilian Northeast, aligning itself with the indications of several other biological groups. Furthermore, the Serra do Urubu harbors many species restricted to the Pernambuco Endemism Center and with some degree of threat. It is confirmed, therefore, that the Serra do Urubu is a center of diversity in the northern part of the Atlantic Forest and corroborates the Pernambuco Endemism Center based on the floristic composition of the families Bromeliaceae, Erythroxylaceae, Myrtaceae and Orchidaceae.

Floristic diversity patterns are reinforced and highlighted that will help build a broader picture of the composition of the angiosperms of the northern portion of the Atlantic Forest. Among the patterns highlighted and corroborated in this study are the relevance of the major angiosperm families common to the Atlantic Forest, the proportionality between the various morpho-functional and ecological groups and the floristic connections of the submontane and montane Atlantic Forest in several areas of the Brazilian Northeast.

The importance of the area is highlighted by this study for preservation efforts at both the regional and national levels due to the diversity and representation of key groups of the Atlantic Forest.

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