

Flowering plants of the Grota do Angico Natural Monument, Caatinga of Sergipe, Brazil

Ana Cecília da Cruz Silva^{1*}, Ana Paula do Nascimento Prata² and Anabel Aparecida de Mello³

1 Universidade Federal de Sergipe, Programa de Pós-graduação em Ecologia e Conservação – PPEC, CEP 49100-000, São Cristóvão, SE, Brasil.

2 Universidade Federal de Sergipe, Programa de Pós-graduação em Ecologia e Conservação – PPEC, CEP 49100-000, São Cristóvão, SE, Brasil.

3 Universidade Federal de Sergipe, Departamento de Ciências Florestais, CEP 49100-000, São Cristóvão, SE, Brasil.

* Corresponding author. E-mail: cecilia.bio@bol.com.br

ABSTRACT: The purpose of this study was to survey the Angiosperms from an area of Caatinga, in the Grota do Angico Natural Monument, state of Sergipe, Brazil. A total of 174 species and 51 families were registered. Fabaceae (29 species) is the family with the highest number of species, followed by Asteraceae (11), Euphorbiaceae (10), Malvaceae and Poaceae (9 each) and Rubiaceae (8), Bromeliaceae, Cactaceae and Convolvulaceae (7 each). Most species are herbaceous (55.2%), followed by trees (20.7%), shrubs and vines (7.5% each), subshrubs (6.3%), epiphytes (1.7%) and hemiparasites (1.2%). Approximately 17% (30 species) of the flora are endemic to the Caatinga, one species is rare and two are vulnerable. Our results reinforce the importance of conserving the remaining forest vegetation against the anthropic pressure.

INTRODUCTION

The Caatinga, also known as Seasonal Dry Tropical Forest (Pennington *et al.* 2004), covers most of the area in the northeast semiarid region (Andrade-Lima 1981). In general, it is characterized as a forest of low stature, composed of trees and shrubs that often have thorns, succulents and a herbaceous stratum that is present only during the short rainy season (Cardoso and Queiroz 2007). Besides the high floristic diversity, with at least 932 Angiosperm species, it also has a high degree of endemism (Giulietti 2003) and different types of vegetation (Prado 2003), which are responsible for the high environmental heterogeneity (Silva *et al.* 2003).

A large portion of the Caatinga presents increased anthropic action and 45.3% of its area is degraded (Santos and Andrade 1992). Currently, it is the third biome most changed by man in Brazil, after the Atlantic Forest and the Cerrado (Castelletti *et al.* 2003). Still, the Caatinga contains the lowest rate and smallest protected area amongst all biomes (Leal *et al.* 2005).

The Grota do Angico Natural Monument is an area of extreme biological importance (Giulietti 2003) and has been greatly modified due to human action. Recently, there has been an increase in research with the biota in this Protected Area (Ribeiro 2007; Ruiz-Esparza *et al.* 2011; Santana *et al.* 2011), but there are few studies on the flora (Ferraz 2009). This study was conducted to determine the Angiosperms floristic composition from an area of Caatinga, in the Grota do Angico Natural Monument, aiming to increase the knowledge of the flora in this Area Protected.

MATERIALS AND METHODS

The study was conducted in an area of 251 ha in a fragment of Caatinga in the Grota of Angico Natural Monument (09°39'53.5"S and 09°39'56.0"S; 37°40'10.3" W and 37°41'06.9" W), which has a total area of 2,183 ha and is situated in the High Wilderness of Sergipe, in

the municipalities of Canindé do São Francisco and Poço Redondo, with the São Francisco River on its northern boundary (Semarh 2009) (Figure 1). The area has megathermal semiarid climate, rainfall 500-700 mm/year (Santos and Andrade 1992). The average annual temperature is 26-28°C and insolation is more than 3,000 h/year (Duarte 2002). The vegetation is represented by two types of forest: dense deciduous hiperxerophilous forest and open vegetation in regeneration stages, with grazing and abandoned areas with saline soils (Ribeiro and Mello 2007).

The floristic survey is based on monthly collection of reproductive material through walks across the area of study, from August 2009 to July 2010. The voucher material is deposited in the Herbarium of the Federal University of Sergipe (ASE). The familiar classification follows APG III (2009) and the spelling of species names was verified by electronic consultation with the Missouri Botanical Garden (2013) and Forzza *et al.* (2013).

The floristic list includes common names, habit, and some categories, such as Caatinga endemics (Giulietti *et al.* 2002; Cardoso and Queiroz 2007; Queiroz 2009), endangered in Brazil (MMA 2008) or in the world (IUCN 2010) and rare in Brazil (Giulietti *et al.* 2009). The SEMARH (Department of Environment and Water Resources) provided the research permit.

RESULTS AND DISCUSSION

The floristic survey of the MONA Grota do Angico presented 174 species and 51 families of Angiosperms (Table 1). Fabaceae, with 29 species (12 in Faboideae, 9 in Mimosoideae, and 8 in Caesalpinioideae) was the most representative family in number of species. In Caatinga, this is the most important group floristically (Queiroz 2006). Other families that deserve mention are Asteraceae (11 species), Euphorbiaceae (10), Malvaceae and Poaceae (9 each), Rubiaceae (8), and Bromeliaceae, Cactaceae and Convolvulaceae (7 each). Together, these nine families

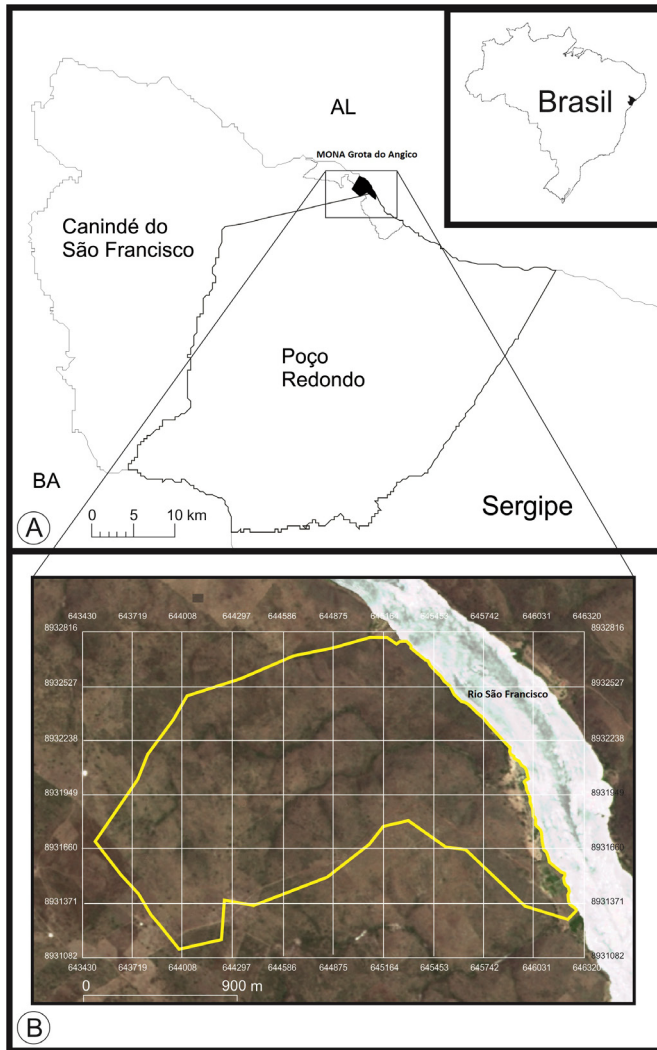


FIGURE 1. Location of study area in the Grota of Angico Natural Monument, Canindé do São Francisco and Poço Redondo, Sergipe, Brazil.

account for 55,7% of all sampled species. A large number of families are poorly represented in the area, 23 of them by only one species (Table 1). These data, along with other surveys conducted in the Caatinga, point to a tendency a great part of plant diversity is concentrated in few families (Araújo *et al.* 1995).

There is a higher percentage of herbaceous plants, with 96 species (55.2%), followed by trees (20.7%), shrubs and vines (7.5% each), subshrubs (6.3%), epiphytes (1.7%) and hemiparasites (1.2%). The high number of herbaceous plants was also found in other areas of Caatinga (Reis *et al.* 2006; Costa *et al.* 2009; Santos *et al.* 2009; Silva *et al.* 2009). The predominance of herbaceous species is likely characteristic of other areas, but most floristic and phytosociological studies in Caatinga, including in Sergipe, are focused on woody species, preventing a more effective

analysis of the plant community. Fabaceae presented the highest richness of herbaceous species per family (14: 11 in Faboideae and 3 in Caesalpinioideae), followed by Asteraceae (10), Poaceae (9) and Malvaceae (8). These families were predominant in different habitats of Caatinga, such as rocky, flat and gallery microhabitats (Araújo *et al.* 2005; Reis *et al.* 2006), crystalline and sedimentary areas (Silva *et al.* 2009), and caatinga *s. str.* (Costa *et al.* 2009).

Forty-nine species, representing 23 families are trees and shrubs. Fabaceae, with 12 species, presented the highest number of woody species (9 in Mimosoideae and 3 in Faboideae), followed by Euphorbiaceae (7), Rubiaceae (4), and Anacardiaceae and Cactaceae (3 each). These families have also presented high representativeness in this stratum in other surveys in Caatinga (Amorim *et al.* 2005; Fabricante and Andrade 2007), including in the state of Sergipe (Souza 1983; Fonseca 1991; Dória Neto 2009; Ferraz 2009; unpublished data). The exception is Rubiaceae, which according to Ferraz *et al.* (1998), is characteristic of areas with higher rates of precipitation and relative humidity and lower temperatures. The results found in this work coincide with the information listed previously, since *Chomelia obtusa*, *Machaonia brasiliensis*, *Tocoyena formosa* and *Tocoyena sellowiana* were collected near the edge of the São Francisco River.

The vines deserve prominence for the considerable number of species (13), representing six families, of which Convolvulaceae, with six species, is the best represented. Similar numbers were found by Alcoforado-Filho *et al.* (2003) and Araújo *et al.* (2005) in other areas of the Caatinga. Epiphytes showed a low number, with only three species of Bromeliaceae.

In this survey, 36 species (20.7%) are endemic to the Caatinga (Table 1); similar numbers were found by Lacerda *et al.* (2007) in a riparian area of this biome. Cactaceae and Fabaceae presented the highest number of endemic species (6 and 5, respectively). Two species (*Myracrodruon urundeuva* and *Schinopsis brasiliensis*) belong to the vulnerable category in the official list of endangered species of Brazilian flora. A rare species, *Lippia pedunculosa*, was also collected. Despite being the only rare species found in the study area, its presence is significant because, according to Giulietti *et al.* (2009), rare species occur in Brazil on average every 3,730 km². The results of this study demonstrate that the dominant families are similar to other families in Caatinga habitats and that the herbaceous, usually neglected in floristic and phytosociological studies, has a great importance in local diversity. The presence of rare species and other endemic and vulnerable to extinction emphasize the importance of this Protected Area and justify greater protection against the anthropic pressure.

TABLE 1. List of families and species of flowering plants from the Grota of Angico Natural Monument, with common names, habits, categories and voucher numbers (ASE), Sergipe, Brazil. Habit: Epi = epiphytic; Her = herbaceous; Hpa = hemiparasite; Shr = Shrub; Ssh = subshrub; Tre = tree; Vin = herbaceous vine or woody vine. Categories: End = endemic; R = rare; VU = vulnerable.

FAMILY / SPECIES	COMMON NAME	HABIT	CATEGORY	VOUCHER
Acanthaceae				
<i>Ruellia asperula</i> (Mart. and Nees) Lindau	Camaratu	Her	-	15678
<i>Ruellia bahiensis</i> (Nees) Morong	Papa-conha	Her	-	16466
Amaranthaceae				
<i>Alternanthera ficoidea</i> (L.) P. Beauv.	Erva-de-ovelha	Her	-	14556
Amaryllidaceae				
<i>Habranthus sylvaticus</i> Herb.	Alho-bravo	Her	-	20303
Anacardiaceae				
<i>Myracrodruon urundeuva</i> Allemão	Aroeira-do-sertão	Tre	VU	15699
<i>Schinopsis brasiliensis</i> Engl.	Braúna	Tre	VU	17874
<i>Spondias tuberosa</i> Arruda	Umbuzeiro	Tre	End	15725
Apocynaceae				
<i>Aspidosperma pyrifolium</i> Mart.	Pereiro	Tre	End	15726
<i>Calotropis procera</i> (Aiton) W.T. Aiton	Algodão-de-seda	Shr	-	14546
<i>Matelea nigra</i> (Decne.) Morillo and Fontella	Porquinho-do-mato	Vin	-	14628
Asteraceae				
<i>Bidens pilosa</i> L.	Carrapicho-de-agulha	Her	-	14626
<i>Centratherum punctatum</i> Cass.	Vassoura-de-botão	Her	-	14553
<i>Conocliniopsis prasiifolia</i> (DC.) R.M. King and H. Rob.	Balaio-de-veio	Her	-	14594
<i>Emilia sonchifolia</i> (L.) DC.	-	Her	-	16480
<i>Eclipta prostrata</i> (L.) L.	Lava-arisco	Her	-	16508
<i>Mikania cordifolia</i> (L. f.) Willd.	-	Vin	-	16503
<i>Tridax procumbens</i> L.	Olho-de-ovelha	Her	-	15677
<i>Vernonia</i> sp.	Anil	Her	-	15698
Sp.	Maniquê	Her	-	14573
Sp.	Erva-besteira	Her	-	15685
Sp.	Pimenta-brava	Her	-	16500
Bignoniaceae				
<i>Tabebuia aurea</i> (Silva Manso) Benth. and Hook. f. ex S. Moore	Craibeira	Tre	-	15934
Boraginaceae				
<i>Heliotropium angiospermum</i> Murray	-	Her	-	14561
<i>Heliotropium procumbens</i> Mill.	Erva-ferro	Her	-	16482
<i>Varronia globosa</i> Jacq.	Pau-de-sapo, sapeiro	Shr	End	16471
Bromeliaceae				
<i>Bromelia laciniosa</i> Mart.	Macambira-de-preá	Her	-	15916
<i>Encholirium spectabile</i> Mart. ex Schult. f.	Macambira-de-flecha	Her	End	15917
<i>Hohenbergia cattingae</i> Ule	Gravatá	Her	End	17494
<i>Neoglaziovia variegata</i> (Arruda) Mez	Croá	Her	End	15933
<i>Tillandsia liliacea</i> Mart. ex Schult. f.	-	Epi	-	15927
<i>Tillandsia recurvata</i> (L.) L.	-	Epi	-	15909
<i>Tillandsia streptocarpa</i> Baker	-	Epi	-	15928
Burseraceae				
<i>Commiphora leptophloeos</i> (Mart.) J.B. Gillett	Imburana-de-cambão	Tre	End	16462
Cactaceae				
<i>Cereus jamacaru</i> DC.	Mandacaru	Tre	End	16461
<i>Harrisia adscendens</i> (Gürke) Britton and Rose	Bugi	Her	End	15931
<i>Melocactus zehntneri</i> (Britton and Rose) Luetzelb.	Cabeça-de-frade	Her	End	-
<i>Opuntia inamoena</i> K. Schum.	Palma-brava	Her	End	15932
<i>Pilosocereus gounellei</i> (F.A.C. Weber) Byles and G.D. Rowley	Xique-xique	Shr	End	-
<i>Pilosocereus pachycladus</i> F. Ritter	Facheiro	Tre	End	-
<i>Tacinga palmadora</i> (Britton and Rose) N.P. Taylor and Stuppy	Quipá	Her	-	14559
Cannabaceae				
<i>Celtis iguanaea</i> (Jacq.) Sarg.	Juá-mirim	Tre	-	15902
Capparaceae				
<i>Cynophalla flexuosa</i> (L.) J.Presl.	Feijão-bravo	Tre	End	15900
Celastraceae				
<i>Maytenus rigida</i> Mart.	Bom-nome	Tre	End	15907
Chrysobalanaceae				
<i>Couepia uiti</i> (Mart. and Zucc.) Benth. ex Hook. F.	Oiti	Tre	-	15901

TABLE 1. CONTINUED.

FAMILY / SPECIES	COMMON NAME	HABIT	CATEGORY	VOUCHER
Combretaceae				
<i>Combretum lanceolatum</i> Pohl ex Eichler	Mofumbo	Shr	-	15672
Commelinaceae				
<i>Commelina diffusa</i> Burm. f.	Olho-de-santa-luzia	Her	-	15911
<i>Commelina erecta</i> L.	Barba-de-bode	Her	-	14582
Convolvulaceae				
<i>Evolvulus elegans</i> Moric.	-	Her	-	14558
<i>Ipomoea brasiliana</i> Meisn.	Batata-de-caititu	Vin	End	16496
<i>Ipomoea megapotamica</i> Choisy	Ritirana	Vin	-	17514
<i>Ipomoea nil</i> (L.) Roth	Ritirana	Vin	-	17513
<i>Ipomoea pes-caprae</i> (L.) R. Br.	Salsa	Vin	-	15894
<i>Jacquemontia corymbulosa</i> Benth.	Cipó-capela	Vin	-	17503
<i>Merremia aegyptia</i> (L.) Urb.	Ritirana-cabeluda	Vin	-	14606
Cyperaceae				
<i>Cyperus ligularis</i> L.	Tiririca	Her	-	15882
<i>Cyperus odoratus</i> L.	Tiririca	Her	-	16507
<i>Cyperus surinamensis</i> Rottb.	Tiririca	Her	-	15913
<i>Fimbristylis dichotoma</i> (L.) Vahl	Tiririca	Her	-	15914
<i>Fimbristylis littoralis</i> Gaudich.	Tiririca	Her	-	16506
Euphorbiaceae				
<i>Acalypha multicaulis</i> Müll. Arg.	Assa-peixe	Her	-	16499
<i>Cnidoscolus urens</i> (L.) Arthur	Cansanção-de-mocó	Shr	-	15943
<i>Croton blanchetianus</i> Baill.	Marmeleiro	Shr	-	15937
<i>Croton heliotropiifolius</i> Kunth	Velame	Shr	-	15705
<i>Euphorbia heterodoxa</i> Müll. Arg.	Tingui	Her	-	14576
<i>Euphorbia hyssopifolia</i> L.	Quebra-pedra	Her	-	14552
<i>Jatropha mollissima</i> (Pohl) Baill.	Pinhão-bravo	Tre	End	14547
<i>Jatropha ribifolia</i> (Pohl) Baill.	Pinhão-manso	Shr	End	15920
<i>Manihot glaziovii</i> Müll. Arg.	Mandioca-brava, maniçoba	Shr	End	16463
<i>Sapium glandulosum</i> (L.) Morong	Burra-leiteira	Tre	-	17875
Fabaceae				
Caesalpinioideae				
<i>Bauhinia cheilantha</i> (Bong.) Steud.	Pata-de-vaca, mororó	Tre	-	16492
<i>Chamaecrista swainsonii</i> (Benth.) H.S. Irwin and Barneby	Amendoim-bravo	Ssh	End	15694
<i>Chamaecrista tenuisepala</i> (Benth.) H.S. Irwin and Barneby	Amendoim-bravo-grande	Ssh	-	17510
<i>Libidibia ferrea</i> (Mart. ex Tul.) L.P. Queiroz	Pau-ferro	Tre	-	15904
<i>Poincianella pyramidalis</i> (Tul.) L.P. Queiroz	Catingueira	Tre	End	16459
<i>Senna obtusifolia</i> (L.) H.S. Irwin and Barneby	Mata-pasto	Her	-	17505
<i>Senna occidentalis</i> (L.) Link	Fedegoso	Her	-	17502
<i>Senna uniflora</i> (Mill.) H.S. Irwin and Barneby	Mata-pasto-cabeludo	Her	-	17511
Faboideae				
<i>Aeschynomene mollicula</i> Kunth	Chinani	Her	-	14607
<i>Centrosema brasilianum</i> (L.) Benth.	Feijão-de-gado	Her	-	14555
<i>Centrosema pascuorum</i> Mart. ex Benth.	Feijão-de-gado	Her	-	16509
<i>Crotalaria retusa</i> L.	Gergelim-bravo	Her	-	14635
<i>Desmodium barbatum</i> (L.) Benth.	Malícia	Her	-	15908
<i>Desmodium glabrum</i> (Mill.) DC.	Carrapicho	Her	-	15682
<i>Indigofera sabulicola</i> Benth.	Malícia-lisa	Her	-	16486
<i>Indigofera suffruticosa</i> Mill.	Anil	Her	-	17518
<i>Macroptilium atropurpureum</i> (Moc. and Sessé ex DC.) Urb.	Feijão-de-gado	Vin	-	14603
<i>Tephrosia cimera</i> (L.) Pers.	Feijão-de-gado	Her	-	16488
<i>Vigna adenantha</i> (G. Mey.) Maréchal, Mascherpa and Stainier	-	Her	-	14577
<i>Zornia brasiliensis</i> Vogel	Amendoim-bravo	Her	-	17497
Mimosoideae				
<i>Albizia inundata</i> (Mart.) Barneby and J.W. Grimes	Tamarindo-bravo	Tre	-	15903
<i>Anadenanthera colubrina</i> (Vell.) Brenan	Angico-de-carçoço	Tre	-	16510
<i>Mimosa pigra</i> L.	Calumbi	Shr	-	15693
<i>Mimosa quadrivalvis</i> L.	Unha-de-gato	Shr	-	17501
<i>Mimosa tenuiflora</i> (Willd.) Poir.	Jurema-preta, jurema-branca	Tre	-	17870
<i>Parapiptadenia zehntneri</i> (Harms) M. P. M. de Lima and H. C. de Lima	Angico-manjola	Tre	End	16458
<i>Piptadenia stipulacea</i> (Benth.) Ducke	Arranhento-branco	Tre	End	17508

TABLE 1. CONTINUED.

FAMILY / SPECIES	COMMON NAME	HABIT	CATEGORY	VOUCHER
<i>Pithecellobium diversifolium</i> Benth.	Carcará	Tre	End	15674
<i>Senegalia bahiensis</i> (Benth.) Seigler and Ebinger	Arranhento-vermelho	Tre	-	16467
Gentianaceae				
<i>Schultesia doniana</i> Progel	-	Her	-	16484
Hydroleaceae				
<i>Hydrolea spinosa</i> L.	Carqueja-do-mato	Her	-	16501
Lamiaceae				
<i>Hyptis suaveolens</i> (L.) Poit.	Alfazema-brava	Ssh	-	17512
<i>Leonotis nepetifolia</i> (L.) R. Br.	Cordão-de-são-francisco	Her	-	15885
<i>Marsypianthes chamaedrys</i> (Vahl) Kuntze	Cidreira	Her	-	17500
<i>Rhaphiodon echinus</i> Schauer	-	Her	-	15892
Loranthaceae				
<i>Psittacanthus cordatus</i> (Hoffmanns. ex Schult. f.) Blume	Enxerto-de-passarinho-grande	Hpa	-	20305
Lythraceae				
<i>Cuphea racemosa</i> (L. f.) Spreng.	Favala-brava	Her	-	17520
<i>Cuphea</i> sp.	Pimentinha	Her	-	17522
Malpighiaceae				
<i>Galphimia brasiliensis</i> (L.) A. Juss.	Pimentinha-brava	Her	-	16477
<i>Ptilochaeta bahiensis</i> Turcz.	Crina-crina	Tre	-	17873
Malvaceae				
<i>Corchorus hirtus</i> L.	Chinani	Her	-	17495
<i>Herissantia crispa</i> (L.) Brizicky	Mela-bode-grande	Her	End	16493
<i>Herissantia tiubae</i> (K. Schum.) Brizicky	Mela-bode-pequeno	Her	End	14623
<i>Melochia tomentosa</i> L.	Cipó-vermelho	Her	-	14565
<i>Pseudobombax marginatum</i> (A. St.-Hil., Juss. and Cambess) A. Robyns	Embira	Tre	-	17869
<i>Sida galheirensis</i> Ulbr.	Malva-branca	Her	End	16469
<i>Sida spinosa</i> L.	Vassourinha	Her	-	15697
<i>Waltheria indica</i> L.	Parente-do-cipó-vermelho	Her	-	15690
<i>Waltheria rotundifolia</i> Schrank	-	Her	-	14565
Molluginaceae				
<i>Mollugo verticillata</i> L.	Erva-rasteira	Her	-	16504
Myrtaceae				
<i>Eugenia puniceifolia</i> (Kunth) DC.	Pitomba-de-cágado	Tre	-	17872
<i>Psidium guajava</i> L.	Goiabeira	Tre	-	14598
Nyctaginaceae				
<i>Boerhavia diffusa</i> L.	Pega-pinto	Her	-	16476
<i>Guapira noxia</i> (Netto) Lundell	João-mole	Tre	-	15918
Olacaceae				
<i>Ximenia</i> sp.	Ameixa-brava	Tre	-	20304
Onagraceae				
<i>Ludwigia elegans</i> (Cambess.) H. Hara	-	Ssh	-	16502
<i>Ludwigia octovalvis</i> (Jacq.) P.H. Raven	Mato-do-brejo	Her	-	16481
Oxalidaceae				
<i>Oxalis divaricata</i> Mart. ex Zucc.	-	Her	-	14551
Papaveraceae				
<i>Argemone mexicana</i> L.	Cansanção-espinhento	Her	-	14595
Plantaginaceae				
<i>Angelonia biflora</i> Benth.	Fumo-bravo	Her	End	16483
<i>Stemodia maritima</i> L.	Mato-do-riacho	Her	-	15676
Plumbaginaceae				
<i>Plumbago scandens</i> L.	Crista-de-galo	Her	-	17499
Poaceae				
<i>Chloris gayana</i> Kunth	Pé-de-papagaio	Her	-	15675
<i>Dactyloctenium aegyptium</i> (L.) Willd.	Pé-de-papagaio	Her	-	14614
<i>Enteropogon mollis</i> (Nees) Clayton	Capim-mimoso	Her	-	14570
<i>Melinis repens</i> (Willd.) Zizka.	Capim-pendão	Her	-	15671
<i>Panicum trichoides</i> Sw.	Guarda-ovalho	Her	-	14554
<i>Paspalum fimbriatum</i> Kunth	Marmelada-branca	Her	-	14627
<i>Paspalum millegrana</i> Schrad.	Arroz-bravo	Her	-	15889
<i>Sorghum</i> sp.	Capim-sempre-verde	Her	-	15890
<i>Urochloa fusca</i> (Sw.) B.F. Hansen and Wunderlin	Marmelada-vermelha	Her	-	16495

TABLE 1. CONTINUED.

FAMILY / SPECIES	COMMON NAME	HABIT	CATEGORY	VOUCHER
Polygalaceae				
<i>Asemeia martiana</i> (A.W. Benn.) J.F.B. Pastore and J.R. Abbott	Mentraste	Her	-	15946
<i>Polygala boliviensis</i> A.W. Benn.	Peixe-boi	Her	-	17517
Portulacaceae				
<i>Portulaca oleracea</i> L.	Berduega	Her	-	15945
Rhamnaceae				
<i>Ziziphus joazeiro</i> Mart.	Juazeiro	Tre	End	15906
Rubiaceae				
<i>Chomelia obtusa</i> Cham. and Schltdl.	Araçá-branco	Shr	-	16470
<i>Diodella apiculata</i> (Willd. ex Roem. and Schult.) Delprete	-	Her	-	14562
<i>Machaonia brasiliensis</i> (Hoffmanns. ex Humb.) Cham. and Schltdl.	Quixabeira-branca	Tre	-	16468
<i>Mitracarpus</i> sp.	-	Her	-	16505
<i>Richardia grandiflora</i> (Cham. and Schltdl.) Steud.	Erva-branca	Her	-	14563
<i>Staelia</i> sp.	Pega-ovelha	Her	-	14571
<i>Tocoyena formosa</i> (Cham. and Schltdl.) K. Schum.	Jenipapo-bravo	Tre	-	15936
<i>Tocoyena sellowiana</i> (Cham. and Schltdl.) K. Schum.	Jenipapo-bravo	Tre	-	16473
Santalaceae				
<i>Phoradendron quadrangulare</i> (Kunth) Griseb.	Enxerto-de-passarinho	Hpa	-	15938
Sapindaceae				
<i>Averrhoidium gardnerianum</i> Baill.	Maresia	Tre	End	16497
<i>Cardiospermum</i> sp.	Amarra-cachorro-pequeno	Vin	-	15704
<i>Serjania glabrata</i> Kunth	Amarra-cachorro	Vin	-	15923
Sapotaceae				
<i>Sideroxylon obtusifolium</i> (Humb. ex Roem. and Schult.) T.D. Penn.	Quixabeira	Tre	-	16464
Solanaceae				
<i>Capsicum caatingae</i> Barboza and Agra	Murta	Shr	-	16474
<i>Schwenckia molissima</i> Nees and Mart.	-	Her	-	15891
<i>Solanum americanum</i> Mill.	Pimenta-brava	Ssh	-	15702
<i>Solanum gardneri</i> Sendtn.	Malícia-de-espinho	Ssh	-	16487
Talinaceae				
<i>Talinum patens</i> Jacq.	Major-gomes	Her	-	15939
Turneraceae				
<i>Piriqueta cistoides</i> (L.) Griseb. subsp. <i>caroliniana</i> (Walter) Arbo	Azedim	Her	-	15912
<i>Piriqueta guianensis</i> N.E. Br. subsp. <i>elongata</i> (Urb. and Rolfe) Arbo	Malva	Her	-	16478
<i>Piriqueta racemosa</i> (Jacq.) Sweet	Malva	Her	-	-
<i>Turnera hermannioides</i> Cambess.	Chanana	Her	-	14586
Verbenaceae				
<i>Lantana camara</i> L.	Chumbinho	Ssh	-	15709
<i>Lantana canescens</i> Kunth	Camará	Ssh	-	14575
<i>Lippia alba</i> (Mill.) N.E. Br. ex Britton and P. Wilson	Erva-cidreira	Ssh	-	15888
<i>Lippia pedunculosa</i> Hayek	Pai-pedro	Ssh	R	15703
<i>Lippia</i> sp.	Alecrim	Ssh	-	14625
Violaceae				
<i>Hybanthus calceolaria</i> (L.) Oken	-	Her	-	16489
Vitaceae				
<i>Cissus decidua</i> Lombardi	Cipó	Vin	-	15700
<i>Cissus simsiana</i> Schult. and Schult. f.	Parreira	Vin	-	17509

ACKNOWLEDGMENTS: The authors would like to thank CAPES for the grant conceded to the first author; PROAP (process 010386/10-78) and PROCAD (process 2334/2008-14) for funding; CNPq via INCT-Herbário Virtual da Flora e dos Fungos; SEMARH, for logistic support and authorization to collect, with the support of S.F. Gouveia, J.S. Mikalauskas e B. B. Souza; all taxonomists (M.F.A. Lucena, R.S. Bianchini, D. Cardoso, L.P. Queiroz, L. Rossi, M.C.S. Mota, M.F. Agra, M.F. Barbosa, M.P. Morim, M.M. Arbo, R. Vanni, J.I.S. Barbosa, M. Oliveira, C. Proença, C.S. Caires, J.R. Maciel, P.C.L. Carvalho, M.L.L. Martins, B.S. Amorim, J.A. Lombardi, M.C. Pessoa, A.P. Prata, M.A. Farinaccio) and students (D.S. Melo, J.E. Nascimento-Júnior, S.M.S. Costa, G.G. Conceição, I.R.N. Menezes, T.V.P. Dantas) for his assistance in species identification; J.V. Vasconcelos, A.F. Pimenta, and S.M. Rocha, for helping to collect the specimens; D.S. Melo and José for the preparation of map; M.M. Nazaré (Seu Didi) and his family, for help in the field and lodgings; A. d'Heursel for reviewing the English.

LITERATURE CITED

- Alcoforado-Filho, F.G., E.V.S.B. Sampaio and M.J.N. Rodal. 2003. Florística e fitossociologia de um remanescente de vegetação caducifolia espinhosa arbórea em Caruaru, Pernambuco. *Acta Botanica Brasílica* 17(2): 287-303.
- Amorim, I.L., E.V.S.B. Sampaio and E.L. Araújo. 2005. Flora e estrutura da vegetação arbustivo-arbórea de uma área de caatinga do Seridó, RN, Brasil. *Acta Botanica Brasílica* 19(3): 615-623.
- Andrade-Lima, D. 1981. The Caatingas dominium. *Revista Brasileira de Botânica* 4(2): 149-163.
- APG (Angiosperm Phylogeny Group) III. 2009. An update of the Angiosperm Phylogeny Group Classification for the Orders and Families of Flowering Plants: APG III. *Botanical Journal of the Linnean Society* 161: 105-121.
- Araújo, E.L., E.V.S.B. Sampaio and M.J.N. Rodal. 1995. Composição florística e fitossociológica de três áreas de Caatinga de Pernambuco.

- Revista Brasileira de Biologia 55(4): 595-607.
- Araújo, E.L., K.A. Silva, E.M.N. Ferraz, E.V.S.B. Sampaio and S.I. Silva. 2005. Diversidade de herbáceas em microhabitats rochoso, plano e ciliar em uma área de caatinga, Caruaru, PE, Brasil. *Acta Botanica Brasílica* 19(2): 285-294.
- Brasil. 2000. *Lei nº 9.985, de 18 de julho de 2000*. Eletronic Database accessible at <http://www.planalto.gov.br/ccivil/leis/L9985.htm/>. Captured on 8 January 2010.
- Cardoso, D.B.O.S. and L.P. Queiroz. 2007. Diversidade de Fabaceae nas Caatingas de Tucano, Bahia: implicações para a fitogeografia do semi-árido do nordeste do Brasil. *Rodriguésia* 58(2): 379-391.
- Castelletti, C.H.M., J.M.C. Silva, M. Tabarelli and A.M.M. Santos. 2003. Quanto ainda resta da Caatinga? Uma estimativa Preliminar; p. 91-100 In J.M.C. Silva, M. Tabarelli, M.T. Fonseca and L.V. Lins (org.). *Biodiversidade da Caatinga: áreas e ações prioritárias para a conservação*. Brasília, DF: Ministério do Meio Ambiente, Universidade Federal de Pernambuco. 382 p.
- Costa, K.C., A.L.A. Lima, C.H.M. Fernandes, M.C.N.A. Silva, A.C.B.L. Silva and M.J.N. Rodal. 2009. Flora vascular e formas de vida em um hectare de caatinga no Nordeste brasileiro. *Revista Brasileira de Ciências Agrárias* 4(1): 48-54.
- Dória-Neto, A.L. 2009. *Florística e fitossociologia de uma área de Caatinga em Porto da Folha, Sergipe*. Monografia (Graduação em Engenharia Florestal). Universidade Federal de Sergipe, São Cristóvão. 28 p.
- Duarte, R. 2002. Dois modelos para a convivência do produtor rural com o ambiente do Semi-árido Nordeste. *Revista Econômica do Nordeste* 33(1): 24-34.
- Fabricante, J.R. and L.A. Andrade. 2007. Análise estrutural de um remanescente de Caatinga no Seridó Paraibano. *Oecologia Brasileira* 11(3): 341-349.
- Ferraz, E.M.N., M.J.N. Rodal, E.V.S.B. Sampaio and R.C.A. Pereira. 1998. Composição florística em trechos de vegetação de caatinga e brejo de altitude na região do Vale do Pajeú, Pernambuco. *Revista Brasileira de Botânica* 21(1): 7-15.
- Ferraz, R.C. 2009. *Florística e fitossociologia de uma área de Caatinga localizada no Monumento Natural Grota do Angico, Sergipe*. Monografia (Graduação em Engenharia Florestal). Universidade Federal de Sergipe, São Cristóvão. 46 p.
- Fonseca, M.R. 1991. *Análise da vegetação arbustivo-arbórea da caatinga hiperxerófila do noroeste do estado de Sergipe*. Tese (Doutorado em Biologia Vegetal). Universidade Estadual de Campinas, Campinas. 187 p.
- Forzza, R.C., P. Leitman, B.M.T. Walter, A. Costa, J.R. Pirani, M.P. Morim, L.P. Queiroz, G. Martinelli, A.L. Peixoto, M.A.N. Coelho, J.R. Stehmann, J.F.A. Baumgratz, L.G. Lohmann and M. Hopkins. 2013. *Angiospermas*. In Lista de Espécies da Flora do Brasil. Jardim Botânico do Rio de Janeiro. Eletronic Database accessible at <http://floradobrasil.jbrj.gov.br/2013/>. Captured on 15 May 2013.
- Giulietti, A.M. (coord.). 2003. Vegetação: áreas e ações prioritárias para a conservação da Caatinga; p. 113-131 In J.M.C. Silva, M. Tabarelli, M.T. Fonseca and L.V. Lins (org.). *Biodiversidade da Caatinga: áreas e ações prioritárias para a conservação*. Brasília: Ministério do Meio Ambiente, Universidade Federal de Pernambuco. 382 p.
- Giulietti, A.M., R.M. Harley, L.P. Queiroz, M.R.V. Barbosa, A.L. Bocage-Neta and M.A. Figueiredo. 2002. Espécies endêmicas da caatinga; p.103-115 In E.V.S.B. Sampaio, A.M. Giulietti, J. Virgínio and C.F.L. Gamarras-Rojas (ed.). *Vegetação & Flora da Caatinga*. Recife: Associação das Plantas do Nordeste – APNE.
- Giulietti, A.M., A. Rapini, M.J.G. Andrade, L.P. Queiroz and J.M.C. Silva (org.). 2009. *Plantas raras do Brasil*. Belo Horizonte: Conservação Internacional, Universidade Estadual de Feira de Santana. 496 p.
- IUCN 2010. *IUCN Red List of Threatened Species*. Version 2010.4. Eletronic Database accessible at <http://www.iucnredlist.org/>. Captured on 22 November 2010.
- Lacerda, A.V., F.M. Barbosa and M.R.V. Barbosa. 2007. Estudo do componente arbustivo-arbóreo de matas ciliares na bacia do rio Taperoá, semi-árido paraibano: uma perspectiva para a sustentabilidade dos recursos naturais. *Oecologia Brasileira* 11(3): 331-340.
- Leal, I.R., J.M.C. Silva, M. Tabarelli and T.E. Lacher Jr. 2005. Mudando o curso da conservação da biodiversidade na Caatinga do Nordeste do Brasil. *Megadiversidade* 1(1): 139-146.
- Missouri Botanical Garden. 2013. *Tropicos*. Eletronic Database accessible at <http://www.tropicos.org/>. Captured on 05 April 2013.
- MMA [Ministério do Meio Ambiente]. 2008. *Lista Oficial de Espécies da Flora Brasileira Ameaçada de Extinção, Brasil*. Instrução normativa nº6 de 23 de setembro de 2008.
- Pennington, R.T., L. Lavin, D.E. Prado, C.A. Pendry, S.K. Pell and C.A. Butterworth. 2004. Historical climate change and speciation: neotropical seasonally dry forest plants show patterns of both Tertiary and Quaternary diversification. *Philosophical Transactions: Biological Sciences* 359(1443): 515-538.
- Prado, D.E. 2003. As Caatingas da América do Sul; p. 3-74 In R.I. Leal, M. Tabarelli and J.M.C. Silva. *Ecologia e conservação da Caatinga*. Recife: Ed. Universitária da UFPE. 823 p.
- Queiroz, L.P. 2006. The Brazilian Caatinga: phytogeographical patterns inferred from distribution data of the Leguminosae; p.113-149 In R.T. Pennington, G.P. Lewis, J.A. Ratter (orgs.). *Neotropical Savannas and Dry Forests: Diversity, Biogeography, and Conservation*. Boca Raton: Taylor & Francis, CRC Press.
- Queiroz, L.P. 2009. *Leguminosas da caatinga*. Feira de Santana: Universidade Estadual de Feira de Santana. 467 p.
- Reis, A.M.S., E.L. Araújo, E.M.N. Ferraz and A.N. Moura. 2006. Inter-annual variations in the floristic and population structure of an herbaceous community of “caatinga” vegetation in Pernambuco, Brazil. *Revista Brasileira de Botânica* 29(3): 497-508.
- Ribeiro, A.S. (coord.). 2007. Estudos para criação do Monumento Natural Grota do Angico. Governo de Sergipe, Secretaria de Estado do Meio Ambiente e dos Recursos Hídricos, Sergipe.
- Ribeiro, A.S. and A.A. Mello. 2007. Diagnóstico da biota; p. 12 In A.S. Ribeiro. (coord.). *Estudos para criação do Monumento Natural Grota do Angico*. Sergipe: Governo de Sergipe, Secretaria de Estado do Meio Ambiente e dos Recursos Hídricos.
- Rocha, S.M. 2012. *Variação temporal e sazonal na estrutura e reprodução de uma taxocenose de lagartos em uma área de Caatinga no Alto Sertão Sergipano*. Dissertação (Mestrado em Ecologia e Conservação). Universidade Federal de Sergipe, São Cristóvão. 83 f.
- Ruiz-Esparza, J., S.F. Gouveia, P.A. Rocha, R. Beltrão-Mendes, A.S. Ribeiro and S.F. Ferrari. 2011. Birds of the Grota do Angico Natural Monument in the semi-arid Caatinga scrublands of northeastern Brazil. *Biota Neotropica* 11(2): 269-276.
- Santana, D.O., R.G. Faria, A.S. Ribeiro, A.C.F. Oliveira, B.B.S. Souza, D.G. Oliveira, E.D.S. Santos, F.A.M. Soares, F.B. Gonçalves, H.C.M. Calasans, H.S. Santos, J.G. Cavalcante, L.S. Martes, L.C. Aschoff, L.C. Rodrigues, M.C.T. Xavier, M.M. Santana, N.M. Soares, P.M.F.G. Figueiredo, S.S.B. Barretto, S.C. Franco and S.M. Rocha. 2011. Utilização do microhabitat e comportamento de duas espécies de lagartos do gênero *Tropidurus* numa área de Caatinga no Monumento Natural Grota do Angico. *Scientia Plena* 7(4):1-9.
- Santos, A.F. and J.A. Andrade. 1992. *Delimitação e regionalização do Brasil Semi-árido*. Aracaju: UFS. 232 p.
- Santos, M.F.A.V., T.N.F. Guerra, M.C. Sotero and J.I.N. Santos. 2009. Diversidade e densidade de espécies vegetais da Caatinga com diferentes graus de degradação no município de Floresta, Pernambuco, Brasil. *Rodriguésia* 60(2): 389-402.
- Semarh – Secretaria do Meio Ambiente e dos Recursos Hídricos. *Unidades de Conservação*. Eletronic Database accessible at <http://www.semarh.se.gov.br/biodiversidade/modules/tinyd0/index.php?id=11>. Captured on 02 May 2009.
- Silva, K.A., E.L. Araújo and E.M.N. Ferraz. 2009. Estudo florístico do componente herbáceo e relação com solos em áreas de caatinga do embasamento cristalino e bacia sedimentar, Petrolândia, PE, Brasil. *Acta Botanica Brasílica* 23(1): 100-110.
- Silva, R.A., A.M.M. Santos and M. Tabarelli. 2003. Riqueza e diversidade de plantas lenhosas em cinco unidades de paisagem da Caatinga; p. 337-365 In I.R. Leal, M. Tabarelli and J.M.C. Silva. (org.). *Ecologia e conservação da Caatinga*. Recife: Editora da UFPE.
- Souza, G.V. 1983. *Estrutura da vegetação da caatinga hipoxerófila do estado de Sergipe*. Dissertação (Mestrado em Botânica). Recife: Universidade Federal Rural de Pernambuco. 95 p.

RECEIVED: August 2011

ACCEPTED: June 2013

PUBLISHED ONLINE: August 2013

EDITORIAL RESPONSIBILITY: Frederico Augusto Guimarães Guilherme