MARCELO FREIRE MORO

SÍNTESE FLORÍSTICA E BIOGEOGRÁFICA DO DOMÍNIO FITOGEOGRÁFICO DA CAATINGA

(FLORISTIC AND BIOGEOGRAPHICAL SYNTHESIS FOR THE CAATINGA PHYTOGEOGRAPHICAL DOMAIN)

CAMPINAS

2013

UNIVERSIDADE ESTADUAL DE CAMPINAS
INSTITUTO DE BIOLOGIA

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(FLORISTIC AND BIOGEOGRAPHICAL SYNTHESIS FOR THE CAATINGA PHYTOGEOGRAPHICAL DOMAIN)

Tese apresentada ao Instituto de Biologia para obtenção do Título de Doutor em Biologia Vegetal.

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CAMPINAS,
2013

Ficha catalográfica
Universidade Estadual de Campinas
Biblioteca do Instituto de Biologia
Mara Janaina de Oliveira - CRB 8/6972

	Moro, Marcelo Freire, 1984-
M828s	Síntese florística e biogeográfica do domínio fitogeográfico da caatinga / Marcelo Freire Moro. – Campinas, SP : [s.n.], 2013.
	Orientador: Fernando Roberto Martins. Tese (doutorado) – Universidade Estadual de Campinas, Instituto de Biologia.
	1. Biogeografia. 2. Caatinga. 3. Biodiversidade - Brasil. 4. Semi-arido - Brasil. I. Martins, Fernando Roberto,1949-. II. Universidade Estadual de Campinas. Instituto de Biologia. III. Título.

Informações para Biblioteca Digital

Título em outro idioma: Floristic and biogeographical synthesis for the caatinga phytogeographical domain
Palavras-chave em inglês:
Biogeography
Caatinga
Biodiversity - Brazil
Semiarid - Brazil
Área de concentração: Biologia Vegetal
Titulação: Doutor em Biologia Vegetal
Banca examinadora:
Fernando Roberto Martins [Orientador]
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Kikyo Yamamoto
Cássia Beatriz Rodrigues Munhoz
Luciano Paganucci de Queiroz
Data de defesa: 30-08-2013
Programa de Pós-Graduação: Biologia Vegetal

Campinas, 30 de Agosto de 2013

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ABSTRACT: Overlooked during most of the twentieth century, the Caatinga Phytogeographical Domain (DFC) has been recognized in the last decades as a unique natural area with much more diversity and endemisms than previously assumed. We are experiencing in the last decades an increase in the publication of floristic and phytosociological studies for the DFC, what offers the opportunity to produce a synthesis for this region. We aimed at evaluating how many species have been collected, their frequency, how many species are expected to exists, and which environment types are more or less sampled. We also mapped which are the most overlooked geographical regions within the CPD. We thus seek to summarize the floristic and phytosociological surveys produced for Caatinga and to sumarize the plant diversity and biogeographical patterns for this region. We evaluate the issue of floristic similarity between different environment types within Caatinga using multivariate analysis and compared the floristic similarity among different subtypes of Caatinga. We also show that areas in crystalline and sedimentary terrains differ not only floristically but also structurally, with different life-form spectra in each environment. We offer here a general overview of the plant divertity in the DFC, making a synthesis of the available surveys, a synthesis of the recorded species and finally a biogeographical synthesis. Thus, we sumarize here a considerable amount of floristic and phytosociological data scattered in the literature and offer a general overview for the Caatinga domain.

Key-words: Plant biodiversity; Semiarid ecosystems; Seasonally dry tropical forests.

RESUMO: Ignorado do ponto de vista dos estudos botânicos e da conservação durante a maior parte do século XX, o Domínio Fitogeográfico da Caatinga (DFC) foi reconhecido a partir das últimas duas décadas como uma região natural única, com vários endemismos e bem mais diversa floristicamente do que se assumiu no século passado. Com o recente aumento na produção de estudos florísticos e fitossociológicos no DFC, surge a oportunidade de produzir uma síntese geral para a região, avaliando quantas espécies já foram coletadas, suas frequências, quantas espécies devem existir, que tipos de ambientes dentro do domínio estão mais ou menos amostrados, além de mapear geograficamente áreas pouco estudadas. Esta tese, portanto, busca fazer uma síntese dos levantamentos florísticos e fitossociológicos e da diversidade vegetal para o domínio da Caatinga. Nós avaliamos a questão da similaridade florística entre diferentes ambientes utilizando técnicas de análise multivariada e comparamos pela primeira vez os diferentes subtipos de Caatinga não apenas florísticamente, mas também pelos seus espectros de formas de vida, mostrando que áreas em geologias cristalinas e sedimentares diferem tanto floristicamente quanto estruturalmente. Com isso, oferecemos aqui uma síntese geral de dados florísticos para o DFC, indo de uma síntese dos levantamentos, passando por uma síntese das espécies e chegando finalmente em uma síntese biogeográfica. Com isso, compilamos um volume considerável de literatura florística e fitossociológica antes dispersa na literatura e oferecemos um quadro geral sobre a diversidade vegetal do DFC.

Palavras-chave: Biodiversidade vegetal; Ecossistemas semiáridos; Florestas sazonalmentes secas.

Sumário

“Moço: toda saudade é uma espécie de velhice”

Grande Sertão: Veredas

AGRADECIMENTOS

Quem escreve uma tese de doutorado, após quatro anos de estudos, disciplinas, intercâmbios e congressos, depois de conhecer tanta gente, ajudar e ser ajudado, viajar para outros países e continentes, fazer tantos novos amigos, tem realmente muito a agradecer. A Deus em primeiro lugar, pelas oportunidades que a caminhada nos oferece e pela direção em momentos difíceis. Pela própria vida nesse mundo tão cheio de beleza. E pela própria natureza, tão indescritivelmente assustadora e bela, perante a qual nós, pequenos seres humanos, deveríamos demonstrar admiração, amor e respeito, em vez de promover essa mesquinha destruição de tudo o que existe de magnífico em busca do lucro desenfreado para alimentar vidas vazias e sedentas de acumulação de bens.

Agradeço de todo o coração à minha família, que sempre me apoiou e que, acima de tudo, me ensinou o amor à vida. À minha mãe Ana, meu pai Carlos e minhas irmãs, Naira e Florinda. À parte cearense da minha família que sempre me recebeu com tanto entusiasmo cada vez que voltava ao Ceará e à parte paulista da minha família, com quem pude conviver muito mais próximo quando mudei do Ceará para São Paulo: minha querida avó Lydia, e aos meus queridos tios-avós/praticamente-avós Tito e tia Ana por tanto carinho, viagens e almoços. Aos primos João, Roseli, Rodrigo e Leandro Moro(s), que me receberam com carinho em suas casas quando mudei para Campinas.

Aos amigos, antigos e recentes, velhos e novos, que me acompanharam nesses quatro gostosos anos de caminhada. À querida Mari Macêdo, que desde o fim da graduação lá na UFC vem sempre me acompanhando nas aventuras e desventuras dessa vida acadêmica e que tem um lugar tão especial em minha vida. Aos novos amigos feitos nas viagens desta tese: Fiorella Mazine (agradecimento especial por ter me apresentado a Eimear, futura co-orientadora), Marla Ibrahim-Uehbe, Ana Luiza Côrtes, Marlon Machado, Domingos Cardoso, Vanessa Staggemeier, Rosa Botterill, Cátia Canteiro, Amelia Baracat, Marcelo Sellaro, Eve Lucas, Priscila Oliveira, Lia, Aristônio, Raquel Viveros. Aos amigos da Unicamp André Rech, Felipe Amorim, Diego, Maurício Fernández (Mau), Vinicius Duartina, Leo Ré, Jeferson Bugoni, Pietro, Aline (Ia), Angélica Robatino (ela foi medalhista na copa forró e ainda faz doutorado!), Polliana Zocche, Talita Reis, Tomate, Gastão, Coquinho, Zulqarnain, Cris Baldauf, Gustavo Shimizu, Zilda, Dany Vinha, Anna Abrahão, Suzana Costa, Zé Júnior, Cinthia, Luciana Franci, Maíra, Ana Paula, Carol Polido, Nívea, Jacira, Mayara Caddah, Julia Meirelles e Leleu, Rose Morokawa, Milena, Marcela Moranguete... Como listar todos? Impossível! A cada um agradeço o privilégio de compartilhar um pouco da minha vida. A Igor Silva (*in memorian*) que partiu enquanto estávamos trabalhando em parceria sobre várias ideias.

A Eimear, minha co-orientadora no Jardim Botânico de Kew, que mais que orientadora, se tornou uma amiga e abriu tantas oportunidades durante meu tempo no Reino Unido. Ao professor Fernando Martins, que também me abriu muitas oportunidades e buscou facilitar minha caminhada acadêmica. Ao professor George Shepherd, que com sua incrível didática, grande inteligência e humildade, me ensinou os primeiros passos da estatística multivariada e sem o qual essa tese não existiria. Tê-lo em minha banca quatro anos depois de ter sido seu aluno é uma honra sem tamanho. À professora Kikyo, pelas boas conversas e pelo apoio no doutorado. Aos professores Maria Rodal, Luciano Queiroz, Ary Oliveira-Filho, Cássia Munhoz, Flávio França, Ramiro Camacho, Francisca Soares e Leonardo Meireles pelas ricas discussões, sugestões de literatura, novas ideias e críticas aos manuscritos.

A Mary Stephens, que me hospedou com tanto carinho ao longo do ano que fiquei em Kew e a todos que dividiram casa comigo naquele ano magnífico e se tornaram amigos queridos: Plauto, Niyi, Hasan, Luciana Oliveira, Juliana Paulino.

À Unicamp, pelas tantas vivências e oportunidades propiciadas, das aulas de extensão em dança de salão ao bandeijão de todos os dias. Ao Jardim Botânico Real de Kew, por oferecer muito mais que uma maravilhosa infraestrutura de pesquisas. O que mais levo na memória são as paisagens incríveis, os contato com tantos pesquisadores de renome, uma biblioteca magnífica, galerias de arte botânica, novos amigos, horas de almoço indo almoçar com o pessoal nas cantinas do jardim ou nos pubs em volta dele, fins de tarde às (21 hrs no verão e às 16hrs no inverno) sentado nos banquinhos do jardim. E como expressar o sentimento de cruzar de bicicleta um dos jardins botânicos mais lindos do mundo ao longo das quatro estações ou ir ao fim da tarde ver o sol se por às margens do Thames? Richmond ficará para sempre em minha memória e coração, bem como as lembranças dos passeios por Londres, dos retornos para casa de metrô (mind the gap!) e dos jantares no kebab perto da estação de Richmond.

Essa tese resultou de um grande esforço pessoal (mas feito com muito entusiasmo) em coligir um volume razoavelmente grande de bibliografia antes dispersa na literatura. Assim, tenho um débito com um grande número de instituições e pessoas que me ajudaram em diversas ocasiões. Todos (e me desculpo de coração por qualquer omissão involuntária) foram listados nos agradecimentos dos respectivos capítulos (especialmente nos capítulos 1 e 2). Essa tese só foi possível pelo financiamento público de duas agências. Agradeço à Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes), que, além do meu mestrado, financiou os seis primeiros meses do doutorado. Mas, especialmente, agradeço à Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP processos 2009/14266-7 e 2011/22498-5) que financiou a maior parte do doutorado, a ida a congressos e o período de intercâmbio sanduíche no Reino Unido.

A todos, citados aqui ou não, meus sinceros agradecimentos e apreço.

Marcelo Freire Moro

Campinas, 2013

INTRODUÇÃO GERAL

O continente sul-americano possui um rico quadro de formações vegetacionais, que variam desde desertos muito secos, nos planaltos andinos e na costa oeste do continente, até florestas úmidas amazônicas (AB'SÁBER, 2008; EVA *et al.*, 2002; OLSON *et al.*, 2001). As grandes regiões naturais do continente já foram organizadas em diferentes sistemas, seja buscando uma classificação morfoclimática (AB'SÁBER, 2008), biogeográfica (MORRONE, 2001), ou conservacionista (OLSON *et al.*, 2001). Do mesmo modo, o Brasil, país de dimensões quase continentais, foi foco de diversos sistemas de classificação fitogeográfica (ver um histórico em IBGE [INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA], 2012) e morfoclimática (AB'SÁBER, 1970, 2003).

Os diferentes sistemas propostos seguiram por vezes caminhos e metodologias diferentes (desde sistemas essencialmente fisionômico-estruturais até aqueles com foco florístico). Com isso, uma gama de diferentes termos foram aplicados aos mesmos domínios fitogeográficos do continente, os quais foram tratados em diferentes níveis de detalhamento e com diferentes focos pela literatura. Os diferentes sistemas de classificações biogegráficas e morfoclimáticas, seja na escala global, continental, ou nacional trataram a região das Caatingas em diferentes escalas, níveis de precisão, em momentos históricos muito distintos e com o suporte de tecnologias muito díspares (desde os mapeamentos feitos no lombo de cavalos no século XIX até mapeamentos realizados com o suporte de modernas imagens de satélite). Deste modo, para atender a diferentes objetivos (e até por limitações no conhecimento e nas tecnologias de cada período histórico), a delimitação, a definição e a nomenclatura aplicada ao domínio das Caatingas variou amplamente com o tempo.

Assim, a região semiárida do nordeste brasileiro recebeu, na literatura, nomes distintos, como: "domínio [morfoclimático] das depressões interplanálticas semi-áridas do Nordeste" (AB'SÁBER, 1970), "Domínio das Caatingas" (AB'SÁBER, 2003, 2008) "província" da Caatinga (CABRERA; WILLINK, 1973), "bioma da Caatinga" (IBGE [INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA], 2004), Ecorregião da Caatinga"[1] (OLSON *et al.*, 2001) e "Subprovíncia Nordestina" (segundo Rizzini subordinada floristicamente à província atlântica) (RIZZINI, 1963), só para dar alguns exemplos.

[1] O nome "ecorregião da Caatinga" não aparece explicitamente no artigo do Olson et al. (2001), mas seu trabalho propõe o reconhecimento de "ecorregiões" para todo o globo e a Caatinga surge no mapa (ver o shapefile disponibilizado na internet pelos autores) como uma dessas ecorregiões, de modo que os autores, implicitamente, classificam o semiárido brasileiro como a "ecorregião da Caatinga".

Um dos primeiros a reconhecer a Caatinga enquanto unidade fitogeográfica foi Carl Friedrich Philipp von Martius que, entre 1817 e 1820, percorreu o território brasileiro em uma expedição de coletas biológicas e foi o primeiro a propor um sistema de classificação fitogeográfica para o Brasil e a publicar um mapa fitogeográfico para o país (HENRIQUES, 2008; MARTIUS, 1824, 1906). O sistema de Martius sofreu várias revisões com o tempo, mas permanece como a base de praticamente todos os sistemas posteriores (FERNANDES; BEZERRA, 1990; FERNANDES, 1998; IBGE [INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA], 2012).

Outros sistemas, uns focando mais em aspectos estruturais da vegetação, outros mais em aspectos florísticos foram propostos com o tempo (ver uma pequena revisão em FERNANDES; BEZERRA, 1990, FERNANDES, 1998 e em IBGE [INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA], 2012). Assim, um dos primeiros problemas quando se tenta fazer uma síntese geral para a Caatinga é definir a extensão geográfica que será foco do estudo e a terminologia mais apropriada para aplicar à essa região.

Terminologia

Em relação à terminologia, o termo que parece mais adequado para os objetivos desta tese é o de "Domínio Fitogeográfico da Caatinga" (DFC) (ANDRADE-LIMA, 1981). O termo "Bioma" vem sendo empregado pelo IBGE (2004) para cartografar os grandes domínios fitogeográficos brasileiros. Entretanto, o termo bioma tem um conceito, historicamente, bem mais restrito. Ele se refere a uma fitofisionomia específica com uma biota típica e uma ecologia própria (COUTINHO, 2006).

Apenas para dar alguns exemplos. No Domínio Fitogeográfico do Cerrado, por exemplo, temos áreas de savanas típicas, as matas de galeria e áreas, denominadas de "cerradão", onde espécies típicas de cerrado atingem porte arbóreo (RIBEIRO; WALTER, 2008). Assim, dentro do Domínio Fitogeográfico do Cerrado teríamos um bioma do cerradão (florestal), outro bioma das matas de galeria e ainda outro bioma das savanas propriamente ditas (esse sim, o bioma do cerrado propriamente falando) (COUTINHO, 2006). Já no Domínio Fitogeográfico da Caatinga teríamos a Caatinga *sensu stricto* (essa sim o bioma da caatinga), o bioma das caatingas de áreas sedimentares, o bioma das matas de galeria, etc.

O conceito de "bioma" é semelhante ao de "formação" e "fitofisionomia", só que o termo bioma engloba também a fauna em sua abrangência e é de escala bem mais restrita que o termo "Domínio Fitogeográfico". Quando o IBGE (2004) fala em biomas do Brasil está, mais corretamente, se referindo aos grandes Domínios Fitogeográficos do Brasil onde, dentro de cada um desses grandes domínios, há diferentes biomas/formações (COUTINHO, 2006).

Vale destacar que o termo Domínio Fitogeográfico se aproxima até certo ponto do conceito de Domínio Morfoclimático, mas eles não são sinônimos. Os Domínios Morfoclimáticos são áreas relativamente vastas, que possuem certa unidade macroclimática, fitogeográfica, geomorfológica e geológica que permite agrupá-las em um único domínio (AB'SÁBER, 1970, 2003, 2008).

Conforme definem CONTI; FURLAN (2011) "a classificação morfoclimática reúne grandes combinações de fatos geomorfológicos, climáticos hidrológicos, pedológicos e botânicos, que por sua relativa homogeneidade são adotados como padrão em escala regional". E ainda: "os domínios morfoclimáticos apresentam áreas homogêneas centrais (áreas *core*) com extensas faixas de transição entre si" (CONTI; FURLAN, 2011). Já os domínios fitogeográficos propriamente ditos estão, naturalmente, mais interessados em vínculos florísticos e processos ecológicos (os quais, claro, são influenciados pelo clima, geologia, solos, hidrologia, etc).

É importante reconhecer que o conceito de Domínio admite certa heterogeneidade interna, já que dentro de cada domínio encontramos uma certa variação climática, diferentes tipos de solos, paisagens, relevos, estruturas geológicas distintas e, especialmente, diversas fitofisionomias (biomas) convivendo. Ademais, entre as áreas nucleares de cada domínio, onde as condições são típicas, há extensas faixas de transição onde as características dos domínios adjacentes se misturam.

Dentro do DFC, por exemplo, há áreas de florestas decíduas, arbustais, áreas rupestres, ambientes aquáticos, etc. Entretanto, o conjunto dessas formações está exposta a um macroclima semiárido, com forte sazonalidade, chuvas irregulares e se desenvolvem predominantemente sobre grandes áreas expostas do escudo cristalino brasileiro (AB'SÁBER, 1974; ANDRADE-LIMA, 1981). Esse conjunto de características é o que acaba por dar uma unidade tanto geográfica quanto florística à região semiárida do nordeste brasileiro e acaba por aproximar o Domínio Morfoclimático da Caatinga proposto por Ab'Saber (1970; 1974; 2003) do Domínio Fitogeográfico da Caatinga (ANDRADE-LIMA, 1981; IBGE [INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA], 2004; VELLOSO *et al.*, 2002). Embora Domínio Morfoclimático e Fitogeográfico não sejam sinônimos, na realidade brasileira a delimitação geográfica de ambos se aproxima bastante e a delimitação de um (AB'SÁBER, 1970, 2003) auxilia bastante na delimitação do outro (IBGE [INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA], 2004; VELLOSO *et al.*, 2002).

Extensão geográfica do Domínio Fitogeográfico da Caatinga

Por fim, é preciso definir a extensão geográfica da área de estudos desta tese. Quando comparamos as diferentes tentativas de cartografar o DFC, vemos (como é bastante natural) que os limites propostos por diferentes autores variam (IBGE [INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA], 2004; MARTIUS, 1906; OLSON *et al.*, 2001; VELLOSO *et al.*, 2002).

A proposta de delimitação do DFC feita por MARTIUS (1906) é especialmente impressionante por ter se baseado em suas viagens por via terrestre/fluvial, já que à época não havia imagens aéreas ou de satélite. Ela é, entretanto, bastante imprecisa para os padrões atuais. Duas propostas cartográficas são de especial utilidade atualmente. A do IBGE (2004), que é a delimitação oficial do Brasil e a de VELLOSO *et al*. (2002), que propõe a subdivisão da Caatinga em unidades geográficas menores que eles denominam de "ecorregiões da Caatinga". Assim, pelo seu maior nível de detalhamento, foi utilizada a delimitação cartográfica do DFC conforme proposta por VELLOSO *et al*. (2002) para delimitar a área de pesquisa dessa tese. A proposta de VELLOSO *et al*. (2002) ainda tem a vantagem de estar subdividida em unidades menores ("ecorregiões"), de modo que é possível avaliar com razoável precisão as áreas localizadas predominantemente sobre terrenos cristalinos e aquelas localizadas predominantemente sobre terrenos sedimentares.

Ab'Saber chama a atenção para o fato de que, na natureza, as condições ambientais variam, sejam de modo mais suave ou mais brusco, ao longo de gradientes (AB'SÁBER, 1970, 1974, 2003). Por isso, Ab'Saber prefere, em seus mapas, adicionar faixas transicionais entre os diferentes domínios morfoclimáticos, em vez de passar uma "linha exata" onde acaba um domínio e começa o outro. Por isso, ao compilar um dado levantamento nas áreas ecotonais do DFC, se a vegetação descrita no trabalho fosse de um tipo vinculada às áreas nucleares (inselbergs ou caatingas de áreas cristalinas localizadas nas áreas transicionais do agreste, ou caatingas de áreas sedimentares localizadas nas áreas transicionais de Campo Maior), esse estudo seria incluído na compilação. Mas Ab'Saber também chama a atenção para o fato de que dentro de um domínio específico há enclaves de ambientes típicos dos domínios adjacentes. Esses enclaves representam ambientes de exceção se considerarmos as macrocondições atuais do DFC, mas eles refletem a dinâmica histórica de mudanças climáticas e vegetacionais de épocas passadas. Assim, no interior do DFC encontramos enclaves de cerrado, enclaves de florestas úmidas (chamadas localmente de "brejos", no Nordeste do Brasil) e enclaves de campos rupestres (COSTA *et al.*, 2004; JUNCÁ *et al.*, 2005; PORTO *et al.*, 2004; RIBEIRO-SILVA *et al.*, 2012) os quais se localizam hoje em dia em meio às formações típicas do DFC.

O objetivo dessa tese foi, portanto, fazer uma síntese florística e biogeográfica para o Domínio Fitogeográfico da Caatinga. Nosso objetivo foi compilar o maior número possível de informações florísticas e fitossociológicas e reuni-las em uma síntese bibliográfica, nomenclatural e biogeográfica. Para a tese foram considerados todos os levantamentos florísticos ou fitossociológicos disponíveis sobre plantas vasculares (com foco nas Angiospermas) para o DFC, conforme os limites cartografados por VELLOSO *et al*. (2002) ou em suas áreas limítrofes/ecotonais (AB'SÁBER, 2003), excluindo-se do estudo apenas os enclaves de cerrado, floresta semidecídua/ombrófila e campos rupestres que ocorrem circunscritos ao DFC. Essas três formações são fitogeograficamente ligadas aos domínios do Cerrado ou da Mata Atlântica e por uma limitação de tempo, de esforço de compilação e de foco biogeográfico, preferimos deixá-las para estudos especificamente voltados para a flora dessas áreas (e.g. RODAL *et al.*, 2008).

Caracterização geral do Domínio Fitogeográfico da Caatinga

Dispersas pelo continente sul-americano há diversas áreas sujeitas a uma estação seca prolongada, superior a cinco meses, onde a disponibilidade de água para a comunidade vegetal é reduzida e imprevisível (AB'SÁBER, 1974; MILES *et al.*, 2006; PENNINGTON *et al.*, 2000; SARMIENTO, 1975). Essas áreas albergam um conjunto complexo de fitofisionomias submetidas a um condicionante ecológico predominante: a restrição de acesso à água durante boa parte do ano (Pennington et al. 2000; Prado 2000).

Devido às convergências ecológicas de comunidades adaptadas à restrição hídrica e à existência de táxons compartilhados disjuntamente por áreas distantes geograficamente (OLIVEIRA *et al.*, 2013; PRADO; GIBBS, 1993; TAYLOR; ZAPPI, 2004), foi proposto que o conjunto de vegetações expostas a climas semiáridos e subúmidos sejam tratadas como uma grande unidade fitogeográfica disjunta, chamadas de Formações Vegetacionais Secas da América do Sul (Dry Plant Formations of South America - SARMIENTO, 1975) ou Florestas Tropicais Sazonalmente Secas (Seasonally Dry Tropical Forests - PENNINGTON *et al.*, 2000; PRADO; GIBBS, 1993). Dentre essas áreas, o Domínio Fitogeográfico da Caatinga (DFC), no Nordeste do Brasil, ocupa mais de 800.000 km^2, o que corresponde a cerca de 10% do território nacional brasileiro (AB'SÁBER, 1974; IBGE [INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA], 2004; MILES *et al.*, 2006; VELLOSO *et al.*, 2002).

A característica mais marcante do DFC é seu clima de semiaridez, o que é atípico para uma região localizada próxima à linha do equador e onde se esperariam climas úmidos, a exemplo da Amazônia e da Mata Atlântica, que compartilham latitudes equivalentes com a Caatinga (AB'SÁBER, 1974, 2003; NIMER, 1989). Conforme o esperado para regiões subequatoriais/tropicais, o clima é megatérmico, com baixa amplitude térmica entre o verão e o inverno e com temperaturas médias anuais tipicamente acima de 24ºC, geralmente entre 26-28ºC, salvo em áreas mais elevadas, como a Chapada Diamantina, Planalto da Borborema ou Ibiapaba (NIMER, 1989).

Entretanto, ao contrário do que se esperaria de uma região subequatorial, o clima da região não é chuvoso, mas semiárido, com precipitação média anual tipicamente inferior a 1.000 mm (e bem menos em algumas áreas, que podem chegar a precipitações inferiores a 500 mm médios anuais) (NIMER, 1972, 1989). Outro fator bastante significativo é a concentração temporal das chuvas. Tipicamente, as chuvas no DFC são concentradas em poucos meses e na maior parte do ano há déficit hídrico, com um período seco anual que pode se estender de seis a impressionantes 11 meses (AB'SÁBER, 1974; IBGE [INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA], 2002; NIMER, 1972, 1989).

O somatório de baixas ou médias precipitações, chuvas concentradas em poucos meses, duração extensa da época seca e elevada insolação resulta em que, após a curta estação chuvosa, a água presente em rios e lagoas temporárias seque rapidamente. Assim, salvo casos de exceção (como o rio São Francisco, que é um rio de grande porte que cruza o DFC), o sistema hídrico da região é temporário e rios e lagoas secam após a época de chuvas (AB'SÁBER, 1974).

Os motivos da semiaridez do DFC, em uma área onde se esperariam climas mais úmidos, é complexo e envolve o fato de que sobre o Nordeste brasileiro se encontram quatro sistemas de circulação atmosférica perturbados. Esses quatro sistemas atmosféricos são os responsáveis pelas chuvas na região nordeste do Brasil, mas eles não atuam ao mesmo tempo, de modo que quando um deles penetra em uma parte do DFC gerando chuvas, os outros sistemas estão estáveis e promovem tempos secos (NIMER, 1972, 1989). Eventualmente, as chuvas podem não vir ou vir de modo bastante brando, resultando na ocorrência de anos de seca (NIMER, 1989). Uma boa revisão climatológica para o nordeste brasileiro está disponível em NIMER (1972; 1989).

Geologicamente, a maior parte do DFC se posiciona sobre uma superfície de origem cristalina, antiga e bastante desgastada pela erosão (ver áreas em cinza escuro da Fig. 1) denominada de "depressão sertaneja". A depressão sertaneja é uma depressão interplanáltica composta por vastas áreas planas e/ou colinas rasas, com a presença recorrente de campos de inselbergs e de alguns grandes maciços residuais (serras ou brejos, a exemplo da Borborema e Baturité) (AB'SÁBER, 1974, 2003). Geologicamente, a depressão sertaneja corresponde aos terrenos cristalinos da porção nordeste do escudo brasileiro, composta especialmente por gnaisses e granitos (AB'SÁBER, 1974; ROSS, 2011).

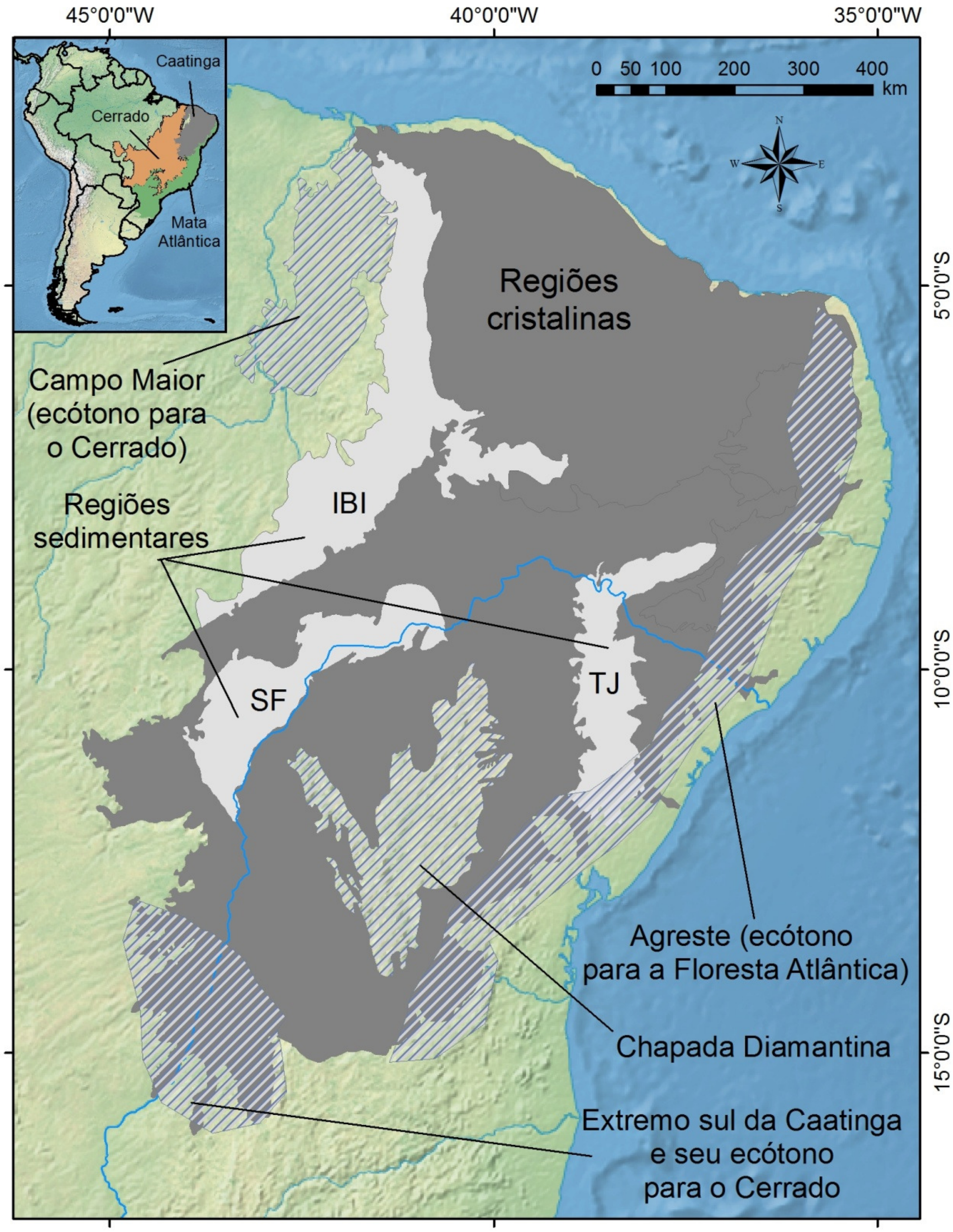

Fig. 1- Delimitação do Domínio Fitogeográfico da Caatinga conforme mapeado por VELLOSO *et al*. (2002) destacando-se as regiões onde predominam terrenos de origem cristalina (cinza escuro) e sedimentar (cinza claro: IBI- bacia sedimentar da Ibiapaba-Araripe; TJ- Bacia sedimentar do Tucano-Jatobá; SF- Dunas Continentais do São Francisco). Áreas hachuradas representam as principais regiões ecotonais do DFC para os quais há dados florísticos publicados (ver capítulos 1, 2 e 3): *Agreste*, na transição do DFC com a Mata Atlântica; *Campo Maior*, na transição com o Cerrado e o *extremo sul da Caatinga no* n*orte de Minas Gerais*, na transição com o Cerrado e a Mata Atlântica. A área hachurada no centro do DFC é a Chapada Diamantina, onde cerrado, caatinga e campos rupestres se misturam (elaboração do mapa: M.F. Moro, modificado de Velloso et al. 2002).

Mas além das superfícies cristalinas erodidas da depressão sertaneja, no DFC há também vastas áreas de origem sedimentar (AB'SÁBER, 1974; BRITO, 1976; VELLOSO *et al.*, 2002). Essas áreas representam as grandes bacias sedimentares Mesozoicas (Ibiapaba-Araripe, Tucano-Jatobá), bacias costeiras (geralmente margeando a costa e fora dos limites do DFC, mas a bacia Potiguar, que inclui a chapada do Apodi se circunscreve ao DFC[2]), e pequenas bacias sedimentares interiores (Rio do Peixe, Mirandiba, etc) espalhadas pelo DFC (BRITO, 1976). AB'SABER (1974) chama a atenção para a existência desses dois tipos principais de ambientes (cristalino e sedimentar) e os considera como "subnúcleos" (*sub-cores*) do DFC, pois ambos os subnúcleos, embora sob um mesmo macroclima semiárido, possuem diferenças geológicas, hidrológicas, pedológicas e geomorfológicas importantes. Dentre estas, destacamos as diferenças edáficas. Enquanto as áreas sobre o embasamento cristalino possuem solos rasos e pedregosos, em geral as áreas sedimentares possuem solos bem mais profundos, os quais, potencialmente, poderiam armazenar água edáfica alcançável pelas raízes das plantas durante a estação seca.

Durante boa parte do século XX, se assumiu que a Caatinga, por seu clima semiárido e vegetação caducifólia, deveria ser pobre em espécies e em endemismos. Disso resultou o fato de, atualmente, a Caatinga ser um dos domínios fitogeográficos mais ameaçados e menos protegidos do Brasil, com cerca de 45% de sua cobertura severamente degradada pela ação humana, e com menos de 2% da sua área designada como unidade de conservação de proteção integral (CASTELLETTI *et al.*, 2003).

Entretanto, estudos do início do século XXI têm revelado que essas áreas têm muito mais espécies do que se assumia no século XX, além de diversos endemismos (CARDOSO; QUEIROZ, 2011; QUEIROZ, 2009; SAMPAIO *et al.*, 2002). Mais do que isso, estudos na escala biogeográfica têm mostrado que a flora existente em áreas sobre o embasamento cristalino no DFC é diferente da flora existente nas áreas de origem sedimentar (bacia sedimentar do Meio Norte, do Tucano-Jatobá e as dunas do São Francisco), sugerindo que há diferentes biotas nesses grandes subtipos de ambientes (chamados por AB'SABER, 1974, de "*sub-cores*") dentro do DFC (ARAÚJO *et al.*, 2011; CARDOSO; QUEIROZ, 2007; GOMES *et al.*, 2006; QUEIROZ, 2006; ROCHA *et al.*, 2004). As listagens de plantas endêmicas somadas aos estudos que mostram que na Caatinga há mais de um núcleo de biodiversidade florística têm revelado que o DFC é muito mais rico e relevante para a conservação biológica do que se supunha ao longo do século XX.

[2] Infelizmente o mapeamento de VELLOSO *et al*. (2002) não cartografou a área da Bacia Potiguar-Chapada do Apodi. Essa chapada sedimentar, de solos ricos em nutrientes, aparece no mapa das "Ecorregiões propostas para o bioma Caatinga" dentro da unidade da "Depressão Sertaneja Setentrional", embora devesse ser tratada como uma geounidade à parte.

Estrutura geral da tese

Devido à percepção de que a Caatinga seria de importância secundária para conservação, este domínio fitogeográfico foi historicamente ignorado pelos estudos de biodiversidade quando comparado com os esforços devotados às florestas úmidas ou ao Cerrado (PRADO, 2000; SANTOS *et al.*, 2011). Como mostraremos nesta tese (Capítulo 1), o número de estudos florísticos e fitossociológicos no DFC passou a crescer consistentemente na última década no século XX, com um recrudescimento mais marcante apenas na década passada.

Entretanto, essas informações florístico/fitossociológicas se encontravam até agora dispersas na literatura, em dezenas de artigos publicados em revistas que vão desde algumas amplamente divulgadas até outras de cunho mais local e de difícil acesso. O aumento no número de publicações sobre o DFC oferece uma oportunidade de síntese e de compor um quadro geral sobre a diversidade vegetal no DFC. Assim, essa tese visou fazer uma extensa compilação dos estudos florísticos e fitossociológicos no DFC e, com eles, realizar uma síntese sobre o conhecimento botânico atualmente disponível. A tese está estruturada em quatro capítulos.

Capítulo 1) O primeiro capítulo sintetizará a bibliografia florístico-fitossociológica atualmente disponível para o DFC, listando a literatura disponível e analisando métodos de amostragem, localização geográfica dos estudos, veículos de publicação e fazendo um pequeno histórico da produção de estudos florístico-fitossociológicos para o DFC. Neste capítulo serão apresentados os resultados de mais de dois anos de compilações de dados, os quais incluíram visitações a universidades de quase todos os estados do Nordeste para coletar bibliografia. Dentre a literatura coligida, levantamentos publicados na forma de artigo foram analisados em maior detalhe. Registramos para cada estudo se o mesmo apresenta dados de florística e/ou fitossociologia, se o trabalho registrou dados para a flora geral, ou apenas para plantas lenhosas ou herbáceas, os métodos fitossociológicos adotados, critérios de inclusão e esforços amostrais, bem como o número de espécies resgistradas em cada estudo. Também mapeamos em um ambiente de sistema de informações geográficas (SIG) cada levantamento publicado como artigo, como forma de indicar visualmente as áreas mais e menos coletadas do DFC e chamar atenção para aquelas com maior carência de dados. Esse capítulo, submetido ao livro "Fitossociologia no Brasil, volume II" tem como objetivo apresentar aos leitores um quadro geral sobre os estudos botânicos no DFC bem como sugerir a pessoas interessadas em realizar novos estudos, métodos e procedimentos adequados e regiões geográficas e tipos de ambiente com maior carência de dados.

Capítulo 2) Esse capítulo visa compor um catálogo geral das espécies reportadas para o DFC nos artigos de florística e fitossociologia compilados. A partir dos artigos coligidos para o primeiro capítulo, excluímos aqueles que apresentavam tabelas de fitossociologia truncadas ou aqueles que foram republicados e criamos um banco de dados com todos os nomes científicos reportados, associando a cada espécie informações ecológicas e geográficas básicas. Cada nome reportado foi acompanhado do tipo de ambiente dentro do DFC em que a planta ocorre, bem como do hábito da planta e formas de vida de Raunkiaer, sempre que disponíveis. Os nomes foram checados segundo o banco de dados da Lista de Espécies da Flora do Brasil (Forzza et al. 2011) e por consultas a mais de 50 especialistas, além de monografias taxonômicas. A nomenclatura botânica foi atualizada para espelhar a apresentada no banco de dados da Flora do Brasil e todos os nomes reportados foram disponibilizados na forma de um catálogo. Comparações biogeográficas e ecológicas também foram realizadas. Comparamos a similaridade florística geral entre os tipos de ambiente, mostrando as relações florísticas entre eles. Além disso, usamos as publicações que informavam os hábitos das plantas para construir espectros de hábitos para 18 áreas do DFC. Com isso, pudemos criar e graficar paralelamente espectros de hábitos para várias áreas, mostrando que áreas cristalinas tem uma proporção maior de plantas não lenhosas que as áreas sedimentares. Isso tem consequências diretas na interpretação da diversidade vegetal da Caatinga. Enquanto historicamente a maioria dos estudos em áreas cristalinas amostrou exclusivamente plantas lenhosas, a maior parte da diversidade vegetal nas caatingas do cristalino parece estar no componente não lenhoso. Por fim, montamos curvas de rarefação e utilizamos índices de estimativa de riqueza de espécies a fim de avaliar o número amostrado de espécies versus o número de espécies esperadas (mas que não foram amostradas) em cada ambiente. Também fizemos uma estimativa da riqueza florística total do DFC, mostrando que mais de 1700 espécies já foram reportadas nos artigos, mas que há um déficit de coletas e que pelo menos 40% das espécies do DFC ainda não foram amostradas em nenhum estudo de florística. Esse manuscrito está submetido à revista Phytotaxa.

Capítulo 3) Esse capítulo visa fazer uma síntese biogeográfica geral para o DFC. Dos estudos utilizados na construção do capítulo 2, foram excluídos aqueles realizados em áreas degradadas (agroecossistemas), estudos que não indicam o tipo de ambiente amostrado (delimitação pouco clara da área estudada) ou que reportam poucas espécies (estudos com menos de 20 espécies foram retirados da análise). Os outros estudos, devidamente classificados em um dos tipos de ambiente existentes no DFC foram comparados por meio de análises multivariadas para avaliar as relações florísticas existentes entre as áreas. As análises sugerem que há três grupos florísticos distintos no DFC. Aquele que ocupa as superfícies sedimentares, o que ocupa o cristalino e aquele que ocupa inselbergs. Embora a maior parte da variação observada entre as áreas não tenha sido capturada pelo modelo de partição de variância utilizado, a variável mais relevante para a determinação da semelhança florística entre as áreas foi o tipo de ambiente, sugerindo que a flora existente entre o sedimentar, cristalino e inselbergs é determinada especialmente por diferenças edáficas, embora o clima também se apresente como uma variável importante. O veículo de publicação deste capítulo ainda não foi escolhido, mas algumas possibilidades são Annals of the Missouri Botanical Garden ou Plant Ecology and Evolution.

Capítulo 4) O capítulo 4 também teve enfoque biogeográfico, mas com o objetivo de comparar os espectros de formas de vida de Raunkiaer no DFC. Esse tipo de dado só se tornou disponível na última década para a caatinga de áreas cristalinas e o primeiro espectro de Raunkiaer na caatinga de áreas sedimentares foi publicado apenas em 2010 (Mendes & Castro 2010), com dados para mais duas áreas publicados em 2011 (Araújo et al. 2011), abrindo a possibilidade de, pela primeira vez, comparar áreas cristalinas e sedimentares não apenas pela flora, mas também pelo espectro biológico. Estudos publicados em inselbergs complementaram esse capítulo, oferecendo uma síntese dos espectros biológicos para a Caatinga e reavaliando, desta vez com um banco de dados mais homogêneo, a relevância do clima, tipo de ambiente e autocorrelação espacial na determinação de comunidades do DFC. Nele, mostramos que cristalino e sedimentar diferem claramente não apenas na flora, mas também nos seus espectros biológicos, onde áreas sedimentares têm predominância de fanerófitos, enquanto áreas cristalinas têm predominância de terófitos. Isso reforça os resultados de espectro de hábito compilados no capítulo 2, onde mostramos que a caatinga do ambiente cristalino têm uma proporção maior de espécies não lenhosas, enquanto a caatinga do sedimentar tem uma maior proporção de espécies lenhosas. Inselbergs apresentam um padrão estrutural mais complexo, com aqueles localizados em áreas de maior precipitação possuindo mais fanerófitos, enquanto aqueles localizados em áreas mais secas possuem mais terófitos. O veículo de publicação deste capítulo ainda não foi escolhido, mas algumas possibilidades são Biotropica, Journal of Arid Environments e Plant Ecology.

Cada capítulo está apresentado na forma de manuscrito, seguindo as regras do veículo escolhido para publicação.

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CAPÍTULO 1 - Síntese dos estudos florísticos e fitossociológicos realizados no Domínio Fitogeográfico da Caatinga

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RESUMO: A atenção dada ao Domínio do Semiárido Brasileiro, ou Domínio Fitogeográfico da Caatinga (DFC), nos estudos florísticos e fitossociológicos foi baixa ao longo do século XX. Entretanto este quadro está mudando e um número crescente de levantamentos foram publicados para essa região. Sintetizamos aqui o corpo de literatura florística e/ou fitossociológica disponível até o ano de 2011, mostrando em que regiões e estados brasileiros o DFC está mais ou menos amostrado. Avaliamos também o número de espécies registradas em cada trabalho, os métodos fitossociológicos mais utilizados e o esforço amostral empreendido pelos pesquisadores em estudos de fitossociologia. Embora o número de estudos no DFC esteja em crescimento, uma porcentagem considerável dos estudos apresentam esforços amostrais muito pequenos (menos de 500 indivíduos registrados em fitossociologias) e pelo menos 40% dos levantamentos não utilizam o critério de inclusão recomendado para a Caatinga, gerando uma heterogeneidade desnecessária nos dados e dificultando o uso dos mesmos em comparações. A maioria dos estudos também focou apenas em realizar um levantamento das plantas lenhosas, ignorando o componente herbáceo da vegetação, o que resulta em uma subestimativa grande da diversidade vegetal no DFC. Sugerimos que novos pesquisadores direcionem novos estudos para as regiões geográficas e tipos de ambiente menos estudados, que utilizem o critério de inclusão mais usual na Caatinga, de DNS igual ou maior que 3 cm e que amostrem, em cada levantamento, tanto plantas do componente lenhoso quanto herbáceo da vegetação.

Palavras-chave: Caatinga; Biomas do Brasil; Levantamentos botânicos.

Introdução

O Domínio Semiárido do Brasil, ou Domínio Fitogeográfico da Caatinga (DFC), ocupa cerca de 840 Km^2 no Nordeste do País e norte de Minas Gerais (Andrade-Lima 1981; IBGE 2004; Queiroz 2009). Suas condições ambientais apresentam grande heterogeneidade, tanto climática

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(devido a gradientes ligados à distância do oceano e à altitude), quanto pedológica e geológica, que influenciam a distribuição das comunidades vegetais (Andrade-Lima 1981; Araújo *et al*. 2005). O tipo principal de vegetação no semiárido brasileiro é a caatinga, uma vegetação espinhosa e decídua, variando no porte de arbórea a arbustiva e que ocorre predominantemente sobre os solos rasos e pedregosos da depressão sertaneja (Andrade-Lima 1981; Araújo *et al.* 2005; Queiroz 2006; 2009). Mas outros tipos de vegetação também ocorrem no DFC. Associadas à depressão sertaneja, ocorrem superfícies sedimentares, onde as condições geológicas e pedológicas são diferentes das áreas cristalinas. Estas áreas abrigam uma vegetação distinta florística e estruturalmente da caatinga, recebendo na literatura diferentes denominações: caatinga de areia, carrascos, caatingas do sedimentar, etc.

Além das superfícies sedimentares, existem também afloramentos rochosos por todo o semiárido, onde os solos ausentes ou pouco desenvolvidos propiciam à flora condições ambientais bastante diferenciadas. Outros tipos de vegetação como as matas ripárias, nas margens dos rios, e a vegetação aquática de lagoas e rios completam o quadro das formações típicas do semiárido. Mas além destas existem também disjunções da Mata Atlântica, Cerrado e Campos Rupestres no interiro do DFC. Essas disjunções, entretanto, têm uma flora oriunda principalmente dos domínios fitogeográficos adjacentes (Porto *et al*. 2004; Araújo *et al.* 2005; Juncá *et al*. 2005; Queiroz 2009). Como um domínio fitogeográfico, o DFC apresenta grande complexidade de comunidades e atualmente está dividido em oito ecorregiões, as quais refletem os grandes grupos de ambientes que existem sob clima semiárido no Nordeste do Brasil (Velloso *et al*. 2002).

Breve histórico dos estudos botânicos no semiárido brasileiro

Os estudos botânicos no DFC se iniciaram no início do século XIX, quando os primeiros naturalistas percorreram os territórios semiáridos do Nordeste do Brasil, registrando as espécies presentes e fazendo observações sobre as vegetações. Um dos primeiros naturalistas no Nordeste do Brasil foi João da Silva Feijó (1760-1824), que trabalhou na capitania do Ceará mapeando recursos minerais e coletando exemplares da fauna e flora (Paiva, 2002). Feijó chegou a produzir um manuscrito intitulado *Collecção Descriptiva das Plantas da Capitania do Seará* (1818), mas a obra não foi publicada, e grande parte dos seus manuscritos foram perdidos (Paiva, 2002).

O naturalista alemão Carl Von Martius (1794-1868), nas suas viagens pelo Brasil (entre 1817 e 1820) que culminaram na publicação da monumental obra *Flora Brasilensis* (publicada entre 1840 e 1906), também coletou no semiárido, onde quase morreu pela escassez de água (Henriques, 2008). Na *Tabulae Phisiognomicae* da Flora Brasiliensis, Martius retrata aspectos das regiões fitogeográficas brasileiras em textos e em várias litografias, representando dentre elas a caatinga. No sistema fitogeográfico de Martius a região do semiárido já era reconhecida como um domínio fitogeográfico distinto, denominado Hamadryades, em referência às ninfas mortais gregas, pelo fato das plantas perderem as folhas na estação seca (Veloso et al., 1991; Fernandes, 1998).

Na segunda metade do século XIX, um grupo de naturalistas brasileiros do Instituto Histórico e Geográfico recebeu apoio da corte para realizar uma expedição científica constituída por brasileiros. Essa expedição, denominada Comissão Científica de Exploração, visava fortalecer a ciência nacional e permitir o descobrimento do Brasil pelos próprios brasileiros. Liderada por Francisco Freire Alemão (1797-1874), foi constituída em 1856 e iniciou seus trabalhos em 1859 (Braga, 1962; Silva Filho, 2006). Os trabalhos da Comissão, entretanto, ficaram restritos praticamente ao território do Ceará. Coletando tanto na região costeira, quanto nas serras e na caatinga do Ceará, os naturalistas registraram parte da flora do Nordeste do Brasil, e, junto com ela, a flora do semiárido, fazendo, dentre outras atividades, a descrição formal de espécies novas. Além desses naturalistas, merece destaque também a atuação do naturalista escocês George Gardner (1812-1849), que esteve no Brasil entre 1836 e 1841 e procurou explorar áreas não percorridas por Martius (Paiva, 2002), coletando também no domínio do semiárido.

Somados a esses primeiros naturalistas, botânicos como Albert Löfgren (1854-1918), Adolpho Ducke (1876-1959) e Philipp Von Luetzelburg (1880-1948) coletaram e viajaram pelo nordeste do Brasil na primeira metade do século XX, caracterizando as fisionomias, descrevendo novas espécies e fazendo notas sobre a ecologia da caatinga. Os primeiros cento e cinquenta anos de estudos no semiárido permitiram o estabelecimento da base nomenclatural para estudos botânicos futuros e produziram os primeiros mapas, listas de espécies (e.g. Ducke, 1953) e observações ecológicas.

Estudos de florística e fitossociologia no Domínio Fitogeográfico da Caatinga

Baseando-se em propostas metodológicas do início do século XX, na segunda metade do referido século o enfoque dos levantamentos botânicos no semiárido começou a mudar. Os primeiros levantamentos no Brasil se preocupavam em produzir floras ou listagens de unidades geopolíticas (para o país ou um estado/província), por meio de expedições que percorriam estradas e coletavam em amplos territórios. Entretanto, logo no início do no século XX, Clements (1905) propôs o método de parcelas, para obter informações quantitativas sobre a estrutura da vegetação junto com dados de florística. Também na primeira metade do século XX foi proposto por Braun-Blanquet o método dos *relevés* (Braun-Blanquet, 1932; Poore, 1955). Esse método consiste em descrever a vegetação de um local delimitado, com características homogêneas, de modo que suas feições possam ser determinadas. O *relevé* era uma lista de plantas de um ambiente homogêneo associada a informações sobre a cobertura vegetal, a comunidade e o ambiente (Braun-Blanquet, 1932; Poore, 1955). Os métodos de parcelas e o do *relevé* colocaram uma nova possibilidade de foco nas pesquisas botânicas. Em vez de listagens de grandes territórios, os estudos poderiam focar na escala local, em áreas mais homogêneas e com comunidades melhor delimitadas.

Assim, no século XX iniciou-se uma nova abordagem nas pesquisas botânicas, produzindo estudos em escalas locais, onde posição geográfica, dados de clima, solo, fitofisionomia e tipo de ambiente poderiam ser associados a uma lista de espécies. Esses levantamentos permitem a incorporação de informações ecológicas e biogeográficas, que oferecem novas possibilidades aos estudos botânicos. Os primeiros trabalhos quantitativos da vegetação do semiárido (e especialmente da vegetação de caatinga) datam das décadas de 1960 e 1970, para determinar o volume de madeira disponível para fins de exploração comercial no Nordeste (ver Martins 1989). Vários trabalhos na escala local passaram a ser produzidos e com o tempo o foco mudou da mensuração de estoque madeireiro para conservação, ecologia e biogeografia (e.g. Gomes 1980; Ferraz *et al*. 1998; Araújo *et al*. 1999).

Apresentamos aqui uma síntese dos estudos “pontuais”. Trabalhos florísticos ou fitossociológicos, herdeiros do *relevé* de Braun-Blanquet e do método de parcelas de Clements (1905), produzidos sobre a flora e a vegetação no DFC. Compilamos o maior número possível desses trabalhos e avaliamos a cronologia de publicações, a distribuição geográfica dos estudos e os métodos utilizados, até a data limite de 2011.

Buscamos aqui responder às seguintes questões:

1) Quantos levantamentos florísticos e fitossociológicos estão disponíveis na literatura sobre o DFC?

2) Quais os métodos e critérios de inclusão mais aplicados aos estudos fitossociológicos?

3) Qual o esforço amostral e qual a riqueza média de espécies registrada por estudos no DFC?

4) Em quais estados brasileiros o semiárido está mais ou menos amostrado?

5) Como variou o número de trabalhos florísticos e/ou fitossociológicos produzidos no DFC ao longo do tempo?

Materiais e métodos

Abrangência geográfica do banco de dados

O Domínio Fitogeográfico da Caatinga (DFC) possui um complexo conjunto vegetacional, incluindo vários tipos de formações características (Andrade-Lima 1981), e encraves vegetacionais dos domínios fitogeográficos adjacentes. Esses encraves representam áreas de cerrado; campos rupestres (especialmente na Chapada Diamantina - Juncá *et al.* 2005); e mata atlântica (os chamados “brejos”, com floresta ombrófila e semidecídua – Porto *et al.* 2004), que ocorrem circunscritos ao domínio semiárido, mas que são floristicamente relacionadas aos domínios fitogeográficos vizinhos. Devido a isso, encraves de Cerrado, Campos Rupestres e Matas Ombrófilas ou Semidecíduas no DFC foram excluídos da nossa compilação. Nosso trabalho visou fazer uma síntese dos trabalhos realizados nas formações típicas do DFC (cujos limites geográficos adotados são aqueles mapeados por Velloso *et al*. 2002), sintetizando o conjunto de dados atualmente disponível na literatura para as seguintes formações do semiárido: caatinga *sensu stricto*, vegetações das áreas sedimentares (carrascos e caatingas de areia), inselbergs, matas de galeria (florestas ripícolas) e comunidades de plantas aquáticas.

Levantamento bibliográfico e tratamento dos dados

Realizamos uma extensa revisão bibliográfica por meio de consultas a todos os volumes publicados das principais revistas de botânica e biologia do Brasil em busca de artigos de florística ou fitossociologia. Após isso, buscamos nas referências bibliográficas dos artigos citações a outros trabalhos ainda não compilados. Também procuramos artigos por meio de indexadores digitais, em especial as bases de dados Web of Science e Google Scholar. Por fim, entre novembro e dezembro de 2011, percorremos várias universidades do Nordeste do Brasil (UFBA, UEFS, UFS, UFPE, UFRPE, UFPB, UFRN, UERN, UFERSA, UFC, UFPI) em busca de teses e dissertações produzidas em cada universidade, bem como artigos em revistas locais de menor circulação e capítulos de livros produzidos pelo corpo científico de cada universidade. Todos os trabalhos produzidos até o ano de 2011 que localizamos foram cadastrados em um banco de dados e depois analisados.

Os trabalhos foram classificados nas seguintes categorias bibliográficas: "teses e dissertações", "livros e capítulos de livro", "artigos em boletins técnicos" e "artigos em periódicos". Consideramos boletins técnicos as publicações seriadas, mas não periódicas e/ou sem revisão por pares, de instituições técnicas (e.g. Embrapa, SUDENE). De todas as formas de publicação, os artigos em periódicos são a forma mais apropriada para apresentação de dados florísticos/fitossociológicos, pois estão disponíveis em bibliotecas públicas, bem como em bibliotecas digitais (JSTOR, Scielo, Scopus, etc.), além de terem passado pelo processo de revisão por pares, incrementando a qualidade dos dados. Assim, produzimos uma síntese mais detalhada sobre os dados publicados em periódicos. Consultamos um a um todos os artigos e registramos quantos levantamentos havia em cada artigo (alguns artigos trazem levantamentos para mais de uma área), o tipo de levantamento (florístico ou fitossociológico), a posição geográfica, estado e município do estudo e a riqueza de espécies registrada. Para estudos fitossociológicos registramos também o método utilizado, o critério de inclusão adotado, o esforço amostral em área (parcelas) ou número de pontos-quadrantes, o esforço amostral em número de indivíduos, a densidade e a dominância de plantas lenhosas da área (Anexos 1 e 2).

Eventualmente, um artigo pode trazer mais de uma lista florística de locais bastante próximos. A escolha sobre a conveniência de tratar esses dados como várias listas florísticas individuais ou como uma única lista florística de maior abrangência geográfica é subjetiva. Registramos no Anexo 2 quando um trabalho pode ser classificado como uma ou várias listagens, dependendo dos objetivos do consulente, para que os leitores possam readaptar os dados às suas necessidades. Muitos artigos (mesmo alguns recentes) não trazem coordenadas geográficas do local estudado ou trazem coordenadas erradas (fora do Estado onde o trabalho foi feito ou mesmo fora do Brasil). Conferimos todas as coordenadas relatadas nos artigos e, na ausência de uma ou quando a indicada no texto estava claramente errada, extraímos uma coordenada de referência dos mapas dos artigos ou, na ausência destes, usamos como coordenada de referência a sede do município onde o trabalho foi realizado.

Incluímos nesse estudo levantamentos florísticos ou fitossociológicos abordando a flora geral, ou uma sinúsia da flora geral (apenas plantas lenhosas, ou apenas plantas herbáceas) de uma área, refletindo apenas estudos florísticos na escala local. Tratamentos taxonômicos de uma família ou gênero, ou floras e catálogos que lidam com uma unidade geopolítica (estado ou município) não foram considerados "*relevés*" e não foram adicionados a este estudo (mas uma excelente flora a nível municipal está disponível em Alves *et al*. 2009). Também não consideramos estudos de etnobiologia, ou de plantas apícolas, ou de plantas consumidas pelo gado, a menos que esses trabalhos, além de uma lista das plantas "úteis" tenham trazido também uma listagem geral de espécies da área estudada.

Resultados

Compilamos neste trabalho 120 artigos de periódicos, os quais traziam 150 levantamentos florísticos ou fitossociológicos para o DFC (Anexos 1 e 2; Fig. 1). Além dos artigos em periódicos, compilamos 17 artigos em boletins técnicos (Anexo 3), 21 livros ou capítulos de livros (Anexo 4) e 92 teses e dissertações (Anexo 5). Os trabalhos mais antigos disponíveis para a Caatinga foram publicados nos boletins técnicos da SUDENE (1969, além de vários trabalhos publicados durante as décadas de 1970 e 1980 – ver Anexo 3) e os primeiros artigos em periódicos surgiram na segunda metade da década de 1970 (e.g. Hayashi & Numata, 1976). Entretanto, a publicação de levantamentos no DFC começou realmente a se fortalecer ao longo da década de 1990, havendo grande aumento de publicações entre 2001 e 2011 (Fig.2; Fig. 3). Só para exemplificar, dos 120 artigos compilados, 99 foram produzidos nesse período. Também a produção de teses e dissertações voltadas para o estudo da flora do semiárido vem aumentando rapidamente (Fig. 3) e 66% das dissertações e teses existentes foram defendidas entre 2001 e 2011. Idealmente, essas teses poderão ser convertidas em artigos e disponibilizadas em periódicos em um futuro próximo.

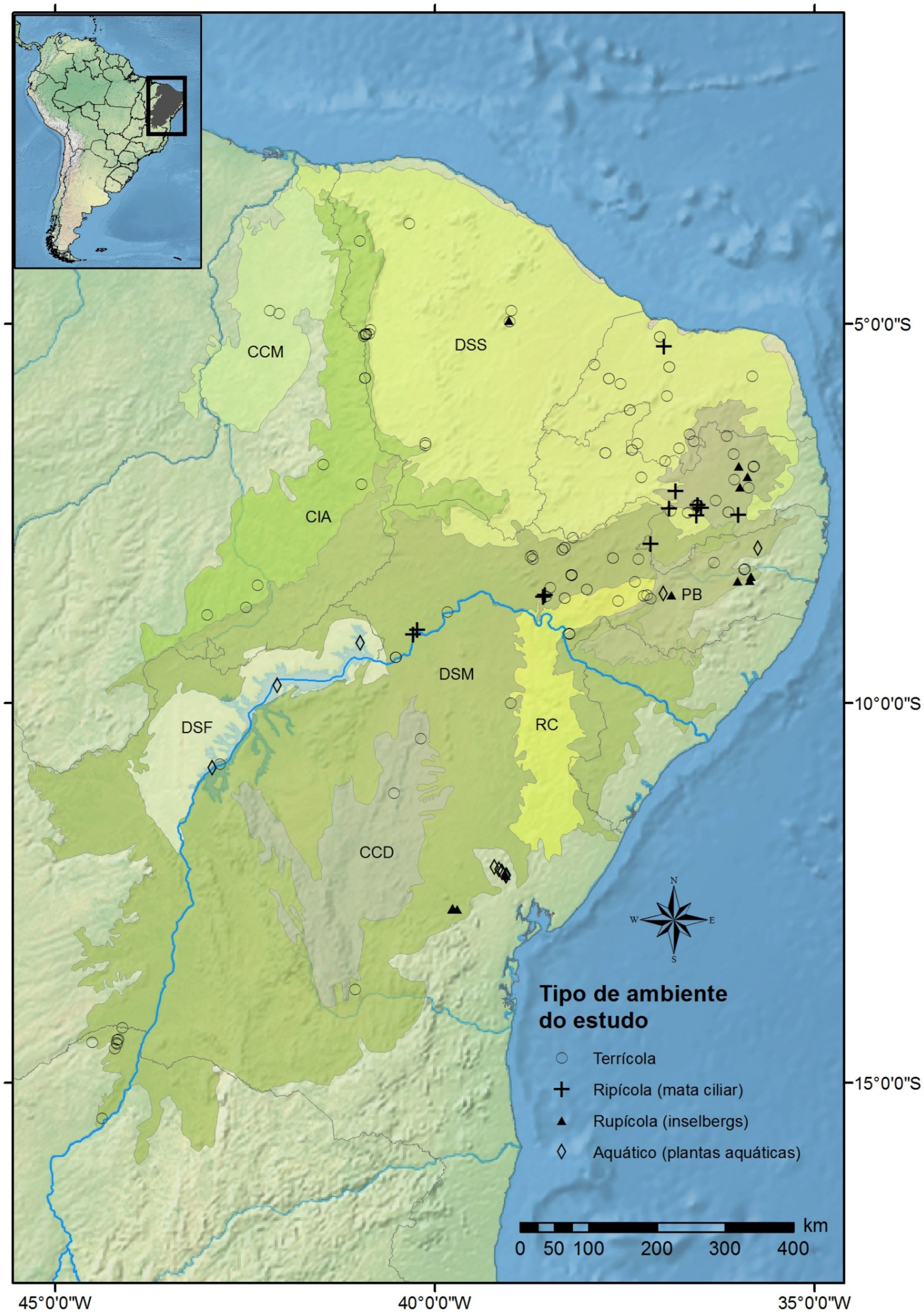

Fig. 1- Distribuição geográfica dos 150 levantamentos florísticos e fitossociológicos compilados para o domínio fitogeográfico da Caatinga (ver Anexos 1 e 2), divididos nos tipos de ambiente de cada estudo. Ecorregiões *sensu* Velloso *et al.* (2002): CCD: Complexo da Chapada Diamantina; CCM: Complexo de Campo Maior; CIA: Complexo Ibiapaba-Araripe; DSF: Dunas do São Francisco; DSM: Depressão Sertaneja Meridional; DSS: Depressão Sertaneja Setentrional; PB: Planalto da Borborema; RC: Raso da Catarina (Elaboração do mapa: M.F. Moro, modificado de Velloso et al. 2002).

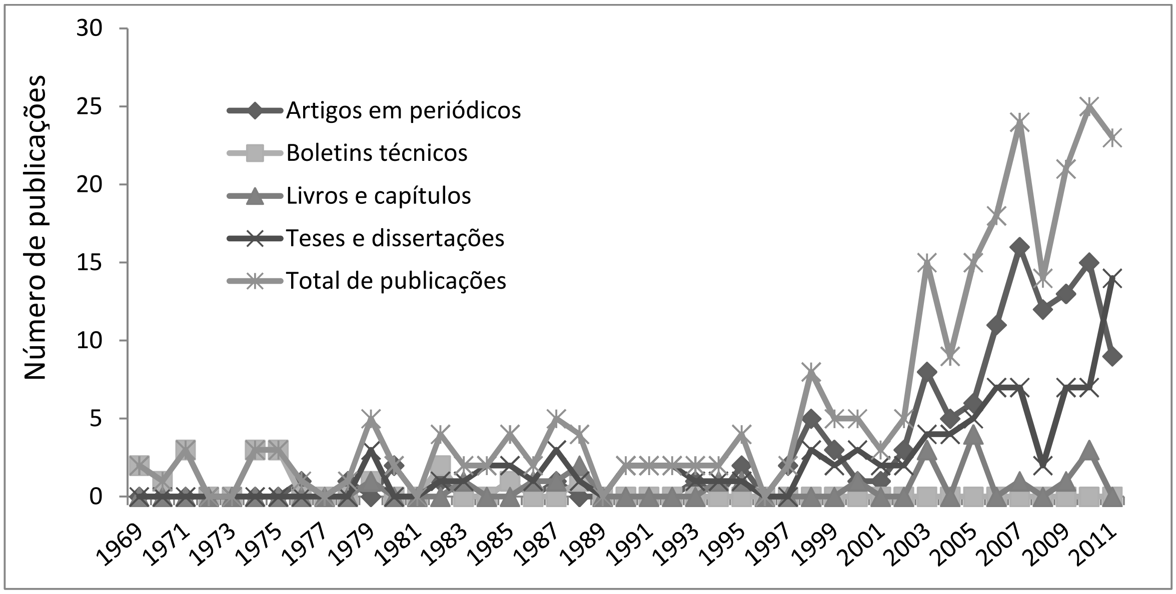

Fig. 2- número de trabalhos florísticos ou fitossociológicos produzidos por ano no domínio semiárido brasileiro até 2011 (lista completa das publicações nos Anexos 1 a 5 no fim do capítulo)

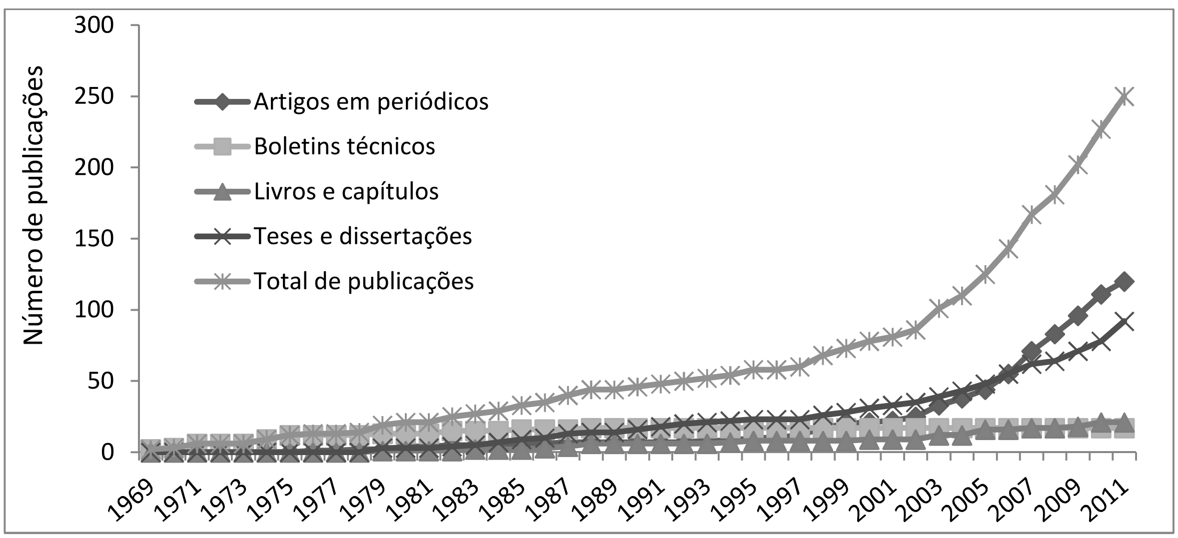

Fig. 3- Total acumulativo de publicações florísticas ou fitossociológicas produzidos no domínio do semiárido brasileiro até 2011 (lista completa das publicações nos Anexos 1 a 5 no fim do capítulo).

Nos 120 artigos publicados em periódicos, encontramos 44 florísticas voltadas para a flora total (listas que amostraram conjuntamente plantas lenhosas e herbáceas); 29 florísticas voltadas apenas para a flora lenhosa; e seis voltadas apenas para o componente herbáceo. Em relação aos estudos fitossociológicos, 75 deles eram voltados ao componente lenhoso e 15 ao herbáceo, além de três estudos em inselbergs, com parcelas que incluem na mesma unidade amostral plantas lenhosas e herbáceas (ver Anexos 1 e 2). Entretanto, sete das fitossociologias voltadas ao componente lenhoso e uma voltada ao herbáceo apresentaram tabelas fitossociologicas truncadas, onde apenas as espécies mais abundantes são apresentadas e os dados para as outras espécies são omitidos. Além disso, cinco estudos do componente lenhoso e cinco do componente herbáceo pretenderam apresentar dados fitossociológicos, mas porque não informaram a área amostrada, não informaram o critério de inclusão adotado, adotaram critérios de inclusão subjetivos (e.g. amostraram plantas com hábito arbóreo/arbustivo em vez de plantas com um tamanho determinado) ou não informaram a abundância das espécies (Anexo 2), são, na verdade, fitossociologias parciais, onde se pode ter ideia da estrutura da área, mas não resgatar os dados para comparações com outras áreas. Algumas fitossociologias apresentam seus dados de tal forma que é possível resgatar apenas os dados absolutos de abundância ou densidade, perdendo-se os outros valores da estrutura (frequência e dominância absoluta) para comparações. Por outro lado, 60 levantamentos fitossociológicos voltados ao componente lenhoso apresentaram uma boa caracterização estrutural das suas áreas, publicando tabelas fitossociológicas completas (não-truncadas) com os descritores de estrutura mais importantes, como densidade, freqüência e dominâncias absolutas e/ou relativas (Duringan, 2003; Moro & Martins, 2011).

Levantamentos fitossociológicos devem fornecer dados numéricos da estrutura de uma vegetação e permitir uma comparação objetiva entre diferentes estandes. Mas para que isso seja possível os estudos devem adotar os mesmos critérios de inclusão, ter esforços amostrais semelhantes e utilizar métodos compatíveis. Das 75 fitossociologias voltados ao componente lenhoso, 64 (85%) utilizaram o método de parcelas, oito o método de quadrantes e três uma variante do método de quadrantes (que denominamos de quadrantes compostos), em que em cada ponto se amostram oito ou mais indivíduos lenhosos, em vez de apenas quatro. O critério de inclusão mais adotado na Caatinga é o diâmetro do tronco no nível do solo (DNS) de 3 cm, seguindo o proposto por Rodal *et al*. (1992). Esse critério foi utilizado por 59% (44) dos levantamentos (Fig. 4; Anexo 2). Uma proporção de 77% dos levantamentos (58) usaram o nível do solo como referência para medição das plantas (DNS de 1 e 3 cm e PNS de 5; 9; 10 e 12 cm foram registrados) enquanto apenas 9 levantamentos (12%) usaram a altura do peito como referência para medição (DAP de 3 e 5 cm e PAP de 3; 6; 10 e 12 cm foram registrados – Fig. 4; Anexo 2). Sete trabalhos (9%) usaram, em vez do diâmetro, uma altura mínima que as plantas devem atingir como critério de amostragem, um usou o diâmetro de cinco centímetros, mas não informou a altura da medição, e um trabalho usou o tipo de hábito das plantas, sem estipular valores objetivos (Fig. 4).

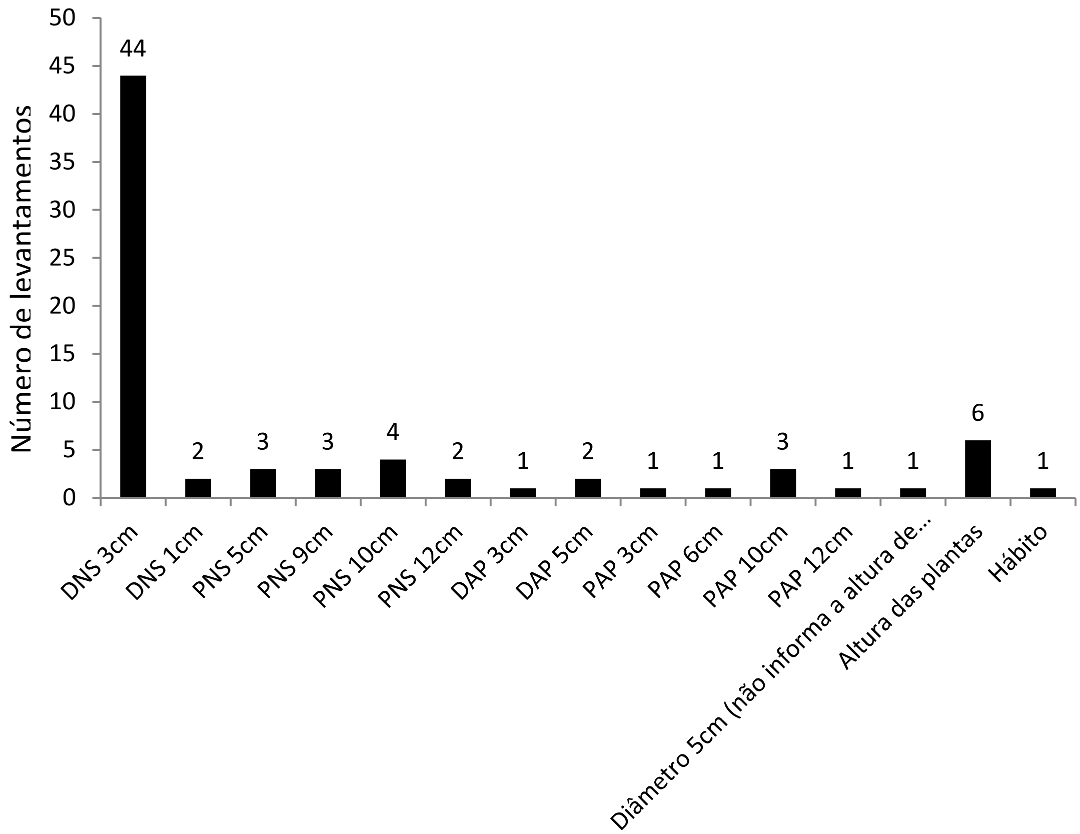

Fig. 4- Critérios de inclusão adotados pelos levantamentos fitossociológicos voltados ao componente lenhoso no semiárido brasileiro.

Em fitossociologias, a área média amostrada pelo método de parcelas na Caatinga foi de 0,57 ± 0,37 ha e o número médio de pontos-quadrantes foi 223,8 ± 255,9 pontos-quadrantes. Esforços amostrais tão pequenos quanto 0,1 ha ou 100 quadrantes (e até menos que isso) foram aplicados em alguns estudos. Apenas 13 trabalhos amostraram 1 ha ou mais, e apenas dois estudos amostraram 250 quadrantes ou mais, seguindo sugestões de esforço amostral feitas por alguns autores (Caiafa & Martins 2007; Moro & Martins 2011). Quando representamos o esforço de coleta das fitossociologias como o número de indivíduos amostrados, a média foi de 1.411,6 ± 1315,8 indivíduos por trabalho. Esforços amostrais bem pequenos, menores que 500 indivíduos, foram aplicados em 25 trabalhos, e menores que 1.000 indivíduos em 38 levantamentos (Fig. 5).

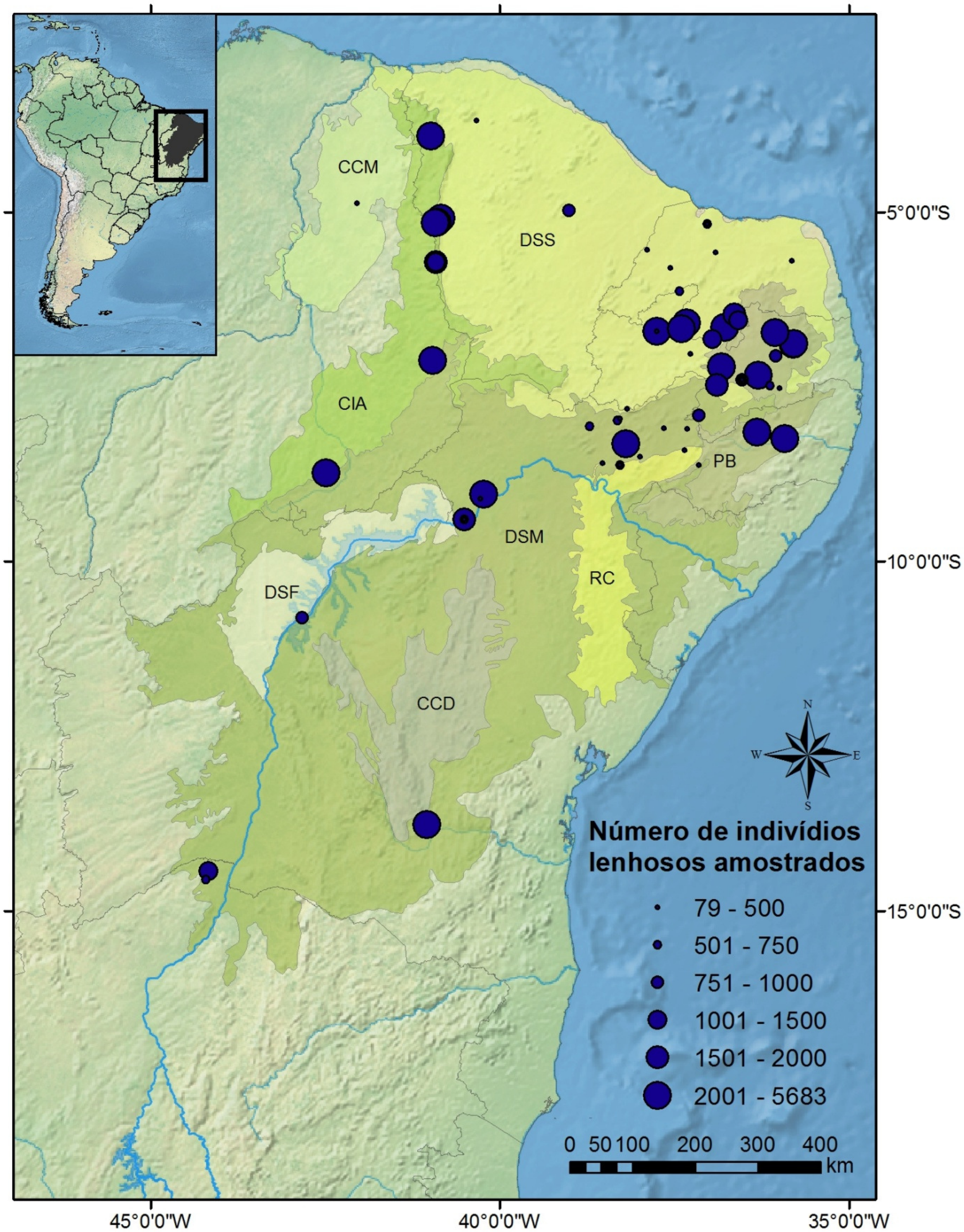

Fig. 5- Esforço amostral, em número de indivíduos, dos artigos de fitossociologia publicados para o Domínio Fitogeográfico da Caatinga (ver Anexos 1 e 2). Ecorregiões *sensu* Velloso *et al.* (2002): CCD: Complexo da Chapada Diamantina; CCM: Complexo de Campo Maior; CIA: Complexo Ibiapaba-Araripe; DSF: Dunas do São Francisco; DSM: Depressão Sertaneja Meridional; DSS: Depressão Sertaneja Setentrional; PB: Planalto da Borborema; RC: Raso da Catarina (Elaboração do mapa: M.F. Moro. Modificado de Velloso et al. 2002).

A riqueza média registrada pelo conjunto total de trabalhos compilados (n=150) variou muito, mas riquezas tão pequenas como 11-15 espécies foram registradas (Fig. 6), especialmente em fitossociologias com pequeno esforço amostral. Florísticas em geral direcionam todo o esforço de coleta para a busca por mais espécies e, por isso, tendem a registrar riquezas maiores. Dentre as florísticas voltadas apenas para o componente lenhoso, a riqueza média foi de 50 ± 20 espécies (n=29). Para as voltadas apenas ao componente herbáceo, a riqueza média foi de 62 ± 14 espécies (n= 6) e a riqueza média em florísticas voltadas à flora total (lenhosas e herbáceas) foi de 106 ± 61 espécies (n= 44), sugerindo que o componente herbáceo constitui uma parte considerável da biodiversidade nas formações do semiárido, superando em número de espécies o componente lenhoso.

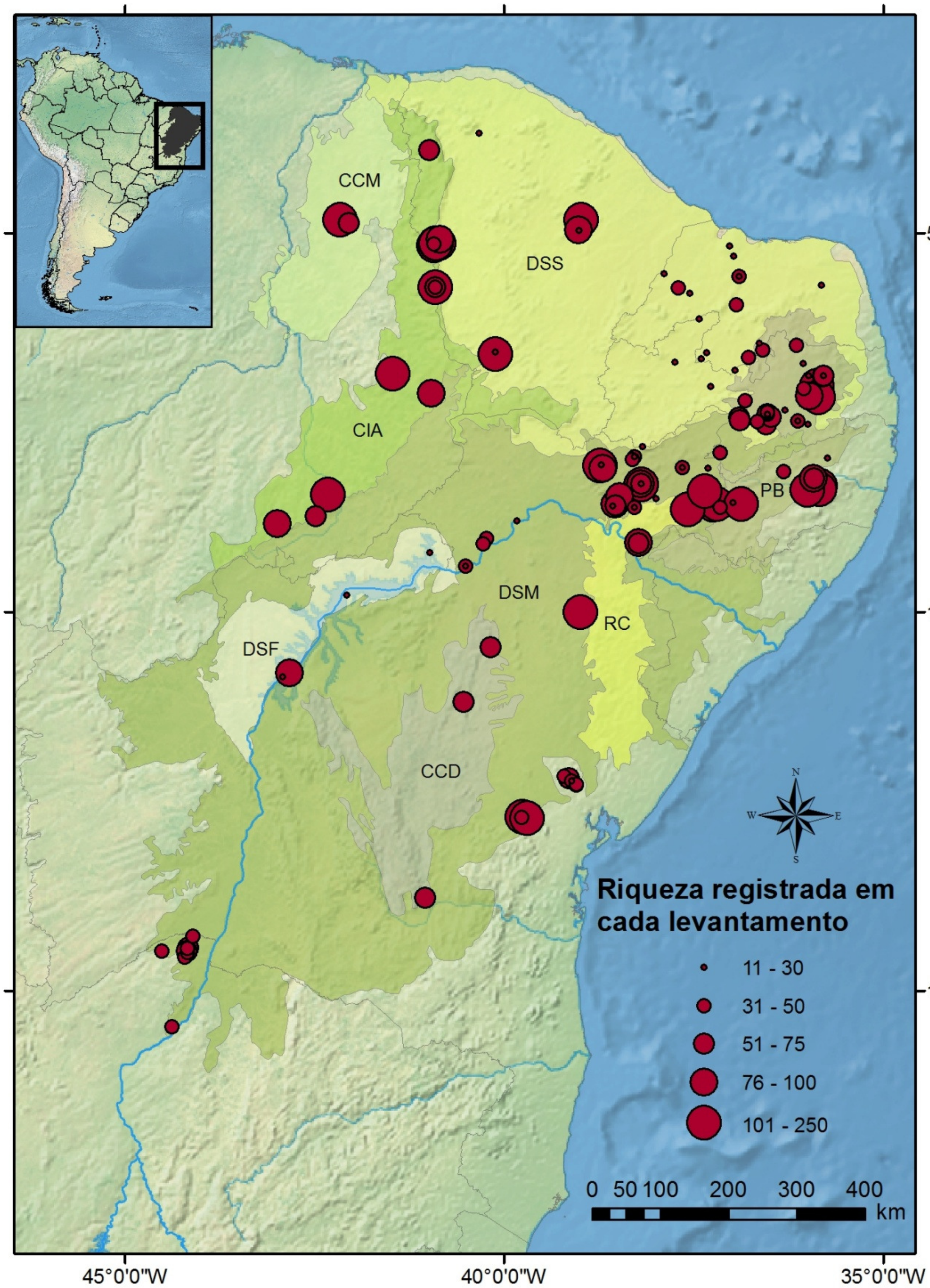

Fig. 6 - Número de espécies registradas pelos 150 artigos de florística ou fitossociologia publicados para o Domínio Fitogeográfico da Caatinga (ver Anexos 1 e 2 e comparar com as Figs. 1 e 5). Ecorregiões *sensu* Velloso *et al.* (2002): CCD: Complexo da Chapada Diamantina; CCM: Complexo de Campo Maior; CIA: Complexo Ibiapaba-Araripe; DSF: Dunas do São Francisco; DSM: Depressão Sertaneja Meridional; DSS: Depressão Sertaneja Setentrional; PB: Planalto da Borborema; RC: Raso da Catarina (Elaboração do mapa: M.F. Moro. Modificado de Velloso et al. 2002).

O estado com maior número de levantamentos publicados em periódicos é Pernambuco, com 46 levantamentos, seguido da Paraíba (33), Rio Grande do Norte (19), Ceará e Bahia (18 cada), Minas Gerais (9) e Piauí (7). Entretanto, quando consideramos o número de levantamentos em relação à área em cada estado dentro do DFC, vemos que Minas Gerais, seguida da Paraíba e Pernambuco, são os estados mais bem amostrados. Não encontramos levantamentos publicados em periódicos (até 2011) para o DFC em Alagoas, Sergipe e Maranhão (Tabela 1; Fig. 1).

Tabela 1- número de levantamentos no semiárido publicados em periódicos e a relação do número de levantamentos pela área do estado dentro do domínio fitogeográfico da Caatinga.

Estado	Área do estado (Km^2)	% do estado no domínio da Caatinga (IBGE 2004)	Área de caatinga no estado (Km^2)	Nº de levantamentos	Levantamentos/ Km^2 de Caatinga
Alagoas	27.779,343	48%	13.334,08	0	-
Bahia	564.830,859	54%	305.008,66	18	1 / 16.944,93
Ceará	148.920,538	100%	148.920,54	18	1 / 8.273,36
Maranhão	331.935,507	1%	3.319,36	0	-
Minas Gerais	586.520,368	2%	11.730,41	9	1 / 1.303,38
Paraíba	56.469,466	92%	51.951,91	33	1 / 1.574,30
Pernambuco	98.146,315	83%	81.461,44	46	1 / 1.770,90
Piauí	251.576,644	63%	158.493,29	7	1 / 22.641,9
Rio Grande do Norte	52.810,699	95%	50.170,16	19	1 / 2.640,53
Sergipe	21.918,354	49%	10.739,99	0	-

Área total aproximada do domínio fitogeográfico da Caatinga no Nordeste Brasileiro: 844.453 Km^2 (IBGE 2004)

Discussão

Inicialmente, os estudos feitos no DFC foram disponibilizados apenas como teses e dissertações não publicadas ou foram publicados em boletins técnicos, em um formato de apresentação de dados que dificulta a utilização dos dados. Felizmente, a publicação de levantamentos na forma de artigo vem aumentando exponencialmente ao longo das últimas duas décadas (Fig. 2; Fig. 3) e é notável tanto o crescimento recente no número de teses e dissertações quanto de artigos em periódicos, que é o formato mais apropriado para a divulgação dos dados. Em meados da década de 1990, Sampaio (1996) estimou em 44 o número somado de teses, dissertações, artigos em periódicos e artigos em boletins técnicos com trabalhos fitossociológicos disponíveis para a Caatinga. Quinze anos depois, encontramos 75 estudos fitossociológicos voltados ao componente lenhoso, 15 voltados ao componente herbáceo e três voltados a ambientes rochosos (inselbergs), além de 79 listas florísticas no DFC. E isso se considerarmos apenas artigos publicados em periódicos. Se incluirmos outras categorias bibliográficas, teremos também 92 teses e dissertações (incluindo estudos florísticos e fitossociológicos com esforços amostrais muito heterogêneos, alguns dos quais já estão publicados na forma de artigo e outros que não possuem amostragem suficiente para tal), 21 livros e capítulos de livro e 17 boletins técnicos (ver anexos de 1 a 5), o que mostra que a produção de dados florísticos e fitossociológicos no DFC está em crescimento (Fig. 2; Fig. 3).

Teses e dissertações são um veículo restrito de divulgação de dados botânicos. Idealmente deveriam ser convertidas em artigos, garantindo maior visibilidade e citabilidade aos dados. Isso parece estar se concretizando, pois a partir de 2007 o número total de artigos produzidos superou o de teses (Fig. 3). O crescimento no número de teses e dissertações também sugere algumas tendências na produção de conhecimento. O primeiro levantamento sobre plantas aquáticas no semiárido, por exemplo, data de 2003 (França et al. 2003), mas só no ano de 2011 dois novos artigos com plantas aquáticas, resultantes de dissertações (Moura Júnior et al. 2011; Lima et al. 2011), foram publicados e novas dissertações recentemente defendidas (e.g. Normando 2011) sugerem que a disponibilidade de dados sobre comunidades pouco amostradas irá aumentar. Do mesmo modo, até 2011 não localizamos artigos florísticos e fitossociológicos para o DFC de Sergipe, Alagoas e Maranhão, mas várias dissertações recentes na Caatinga de Sergipe (ver anexo 5) sugerem que essa carência logo deverá ser sanada.

Em relação aos estudos publicados como artigos em periódicos, os quais foram analisados com mais detalhes, os esforços amostrais e critérios de inclusão variaram bastante. Alguns artigos de fitossociologia trazem levantamentos com esforço amostral muito pequeno, com menos de 500 indivíduos (Fig. 5), o que resulta em uma caracterização bastante pobre dos estandes estudados, com poucas espécies registradas (Fig. 6). Também chamamos a atenção para dois aspectos metodológicos que vêm sendo ignorados por boa parte dos levantamentos e que deveriam ser centrais para pesquisadores em fitossociologia: a adoção de critérios de inclusão padronizados e a descrição da área estudada atendendo ao protocolo mínimo estabelecido pela Comissão de Fitossociologia da Sociedade Botânica do Brasil (ver Felfili et al. 2011). Alguns estudos recentes não fornecem sequer coordenadas geográficas ou não descrevem adequadamente o tipo de ambiente da área de estudo, reduzindo a utilidade do levantamento para outros pesquisadores.

Quanto ao critério de inclusão, Rodal et al. (1992) propuseram o DNS ≥ 3 cm para amostragem do componente lenhoso na Caatinga, e esse critério tem sido utilizado por 59% dos estudos. A menos que os autores tenham algum objetivo específico (e.g. amostragem de indivíduos de pequeno porte para estudos de regeneração), o ideal é utilizar esse mesmo valor (DNS≥ 3cm) para novos estudos, compatibilizando os novos resultados com a literatura já produzida. Os valores de densidade da comunidade variam muito quando critérios de inclusão diferentes são utilizados (Sampaio 1996; Martins & Santos 1999; Durigan 2009), tornando estudos com diferentes critérios de inclusão de difícil comparação. Em relação à altura de medição, o nível do solo é a altura mais prática para medir os indivíduos nas formações do semiárido, porque as plantas em geral são muito ramificadas. No nível do solo basta obter uma medida de diâmetro para cada indivíduo, facilitando o trabalho de campo, ao passo que no nível do peito as plantas podem ter uma ramificação excessiva, exigindo a tomada de várias medidas (Rodal *et al*. 1992; Moro & Martins 2011). Além disso, arbustos de baixa estatura podem não ter ramos grossos a 1,3 m de altura, excluindo esse importante componente da amostragem da caatinga.

A prática de truncar as tabelas fitossociológicas, apresentando apenas os dados de estrutura para as espécies de maior IVI, também não deve ser feita, já que gera a perda de informações sobre um componente fundamental das comunidades vegetais: as espécies raras. Além disso, várias comparações se tornam impossíveis caso a tabela fitossociológica seja truncada, reduzindo imensamente a utilidade do trabalho para os outros pesquisadores. Uma síntese do protocolo mínimo da Comissão de Fitossociologia da Sociedade Botânica do Brasil, para estudos de estrutura, está disponível em Felfili et al. (2011), e um manual de métodos fitossociológicos, critérios de inclusão e procedimentos para a construção de tabelas fitossociológicas está presente em Durigan (2003) e em Moro & Martins (2011).

Alguns estudos utilizaram uma variante do método de quadrantes, em que em cada ponto-quadrante são amostrados quatro arbustos e quatro árvores com DNS de 3cm, em vez de simplesmente as quatro plantas com DNS de 3 cm mais próximas. Denominamos esse método de quadrantes compostos. O método de quadrantes se baseia na relação da distância das plantas ao ponto central para estimar a densidade e dominância, mas como nos quadrantes compostos usam-se dois critérios de inclusão para um mesmo ponto (DNS ***e*** hábito da planta), o resgate da densidade ou dominância da comunidade lenhosa total é dificultado. Se o objetivo do trabalho for comparar os componentes arbóreo e arbustivo de uma área, é mais conveniente usar o método de parcelas, que tem área fixa e permite facilmente a junção ou separação dos subcomponentes da vegetação por outros pesquisadores.

A riqueza média amostrada em estudos florísticos indica que na Caatinga há mais espécies no componente herbáceo-subarbustivo que no lenhoso. Historicamente, a maioria dos estudos no semiárido focou no componente lenhoso, mas recentemente o componente herbáceo-subarbustivo vem sendo mais frequentemente amostrado (e.g. Reis *et al*. 2006; Silva *et al*. 2009), com vários artigos que incluem plantas de todos os hábitos, o que permite uma melhor caracterização da biodiversidade vegetal e mostra a importância das herbáceas no DFC (e.g. Costa et al. 2007; Araújo *et al*. 2011).

Rocha et al. (2004), Gomes et al. (2006), Cardoso & Queiroz (2007) e Araújo et al. (2011) chamaram a atenção para o fato de que as formações que ocorrem sobre áreas sedimentares possuem uma flora distinta da caatinga das áreas cristalinas. Dentre as ecorregiões sedimentares, a da Ibiapaba-Araripe (majoritariamente no estado do Piauí) é a maior de todas e também a que dispõe do maior número de levantamentos. Outras ecorregiões sedimentares como a das Dunas do São Francisco só foram amostradas por poucos estudos. Embora vários levantamentos em Inselbergs estejam publicados, todos se concentraram em áreas de origem cristalina. Estudos sobre a composição florística de inselbergs nas ecorregiões sedimentares são bastante desejáveis. Contrastando com a grande extensão territorial do semiárido, muitas áreas têm sido pouco ou nada amostradas, com grandes vazios de publicações para a região centro-sul do estado da Bahia. Também não localizamos artigos no DFC de Alagoas, Sergipe e Maranhão. Por outro lado, várias dissertações recentemente defendidas na UFS (Anexo 5) sugerem que logo surgirão artigos publicados para Sergipe. Seria interessante também ter dados florísticos e fitossociológicos na caatinga do Maranhão, já no limite oeste de distribuição do domínio.

Conclusões

No total, verificamos ser necessário aumentar a cobertura de coletas para o semiárido brasileiro, mas também vemos que o ritmo de publicações florístico-fitossociológicas vem aumentando vertiginosamente nos últimos vinte anos. Formações antes não estudadas como comunidades de plantas aquáticas e as caatingas das Dunas do São Francisco passaram a ser alvo recente de levantamentos, mas ambientes como os inselbergs de áreas sedimentares ainda não foram investigados. Embora o número de levantamentos venha crescendo, alguns artigos apresentam esforço amostral diminuto (menos de 500 indivíduos registrados) e listas florísticas bastante reduzidas, sendo de menor utilidade. Do mesmo modo, artigos que publicaram tabelas fitossociológicas truncadas reduziram fortemente a utilidade dos dados para estudos comparativos e macroecológicos. Assim, o número de artigos realmente consistentes é menor do que o número total de publicações. Idealmente precisamos de mais trabalhos florísticos que invistam pelo menos um ano de coletas mensais na área de pesquisa (a fim de registrar um número razoável de espécies) e fitossociológicos com esforço amostral de 1 ha e critérios de inclusão de DNS $\geq$ 3 cm, especialmente nos estados da Bahia, Sergipe, Alagoas e Maranhão, mas também em boa parte do Ceará (ver Fig. 1). Novos levantamentos deveriam preferencialmente ampliar a cobertura amostral em regiões menos coletadas, em vez de focar nas áreas mais conhecidas (Fig. 1). Sempre que possível, os pesquisadores devem manter o máximo de padronização metodológica, a fim de possibilitar a comparabilidade de seus resultados com outros estudos. Se o objetivo do trabalho for fazer uma descrição da estrutura comunitária da vegetação, o uso do critério de inclusão mais adequado é o DNS $\geq$ 3 cm, já utilizado pela larga maioria dos levantamentos publicados no semiárido (Rodal et al. 1992; Moro & Martins 2011).

Agradecimentos

Os autores agradecem a todos os professores e pesquisadores das universidades do Nordeste do Brasil (UFBA, UEFS, UFS, UFPE, UFRPE, UFPB, UFRN, UFERSA, UERN, UFC e UFPI), os quais gentilmente permitiram o acesso a suas bibliotecas particulares, indicaram referências e forneceram cópias de seus próprios trabalhos durante o processo de compilação bibliográfica. Também agradecemos às equipes de bibliotecários das várias universidades, e especialmente a da Unicamp, que forneceram suporte para a localização e manejo das referências bibliográficas aqui apresentadas. Esse projeto demandou a visitação a pesquisadores e bibliotecas de onze instituições em sete estados nordestinos, mais consultas à coleção de periódicos da Unicamp, em São Paulo, e só foi possível pelo financiado obtido por meio da concessão de bolsa de doutorado da Fundação de Amparo à Pesquisa do Estado de São Paulo (processo FAPESP 2009/14266-7) ao primeiro autor.

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Anexo 1- Levantamentos florísticos ou fitossociológicos realizados na região do semiárido brasileiro (domínio fitogeográfico da Caatinga) publicados em periódicos, associados à localização geográfica e referências bibliográficas de cada levantamento. Quando uma lista florística/fitossociológica produzida pelos mesmos autores para a mesma área foi disponibilizada mais de uma vez, indicamos que o trabalho mais antigo foi republicado em um trabalho posterior. O código de cada área (Cod. área) é o mesmo entre os anexos 1 e 2

Cod. área	UF	Município	Vegetação	lat (S)	long (O)	Autores	Ano	Revista	Volume	Páginas	Republicado em
1	BA	Feira de Santana	Plantas aquáticas – região do Agreste	12º16’24’’	39º03’10’’	França *et al.*	2003	Acta Botanica Brasilica	17(4)	549-559	
2	BA	Feira de Santana	Plantas aquáticas – região do Agreste	12º16’32’’	39º03’22’’	França *et al.*	2003	Acta Botanica Brasilica	17(4)	549-559	
3	BA	Angüera	Plantas aquáticas – região do Agreste	12º13’30’’	39º06’42’’	França *et al.*	2003	Acta Botanica Brasilica	17(4)	549-559	
4	BA	Angüera	Plantas aquáticas – região do Agreste	12º13’24’’	39º06’59’’	França *et al.*	2003	Acta Botanica Brasilica	17(4)	549-559	
5	BA	Angüera	Plantas aquáticas – região do Agreste	12º11’38’’	39º09’07’’	França *et al.*	2003	Acta Botanica Brasilica	17(4)	549-559	
6	BA	Angüera	Plantas aquáticas – região do Agreste	12º10’	39º12’36’’	França *et al.*	2003	Acta Botanica Brasilica	17(4)	549-559	
7	BA	Itatim	Inselberg-Caatinga	12º42’40’’	39º46’18’’	França *et al.*	2006	Sitientibus Série Ciências Biológicas	6(1)	30-35	
8	BA	Feira de Santana	Inselberg-Agreste	12º16’18’’	39º03’39’’	França *et al.*	2005	Hoehnea	32(1)	93-101	
9	BA	Itatim	Inselberg-Caatinga	12º43’	39º42’	França *et al.*	1997	Sitientibus	17	163-176	
10	BA	Itatim	Inselberg-Caatinga	12º42’	39º46’	França *et al.*	1997	Sitientibus	17	163-184	
11	BA	Vários - Uauá adotado como referência	Caatinga (raso da Catarina)	10º	39’	Guedes	1985	Rodriguésia	37(62)	5-8	
12	BA	Contendas do Sincorá	Caatinga arbórea com elementos de	13º46’	41º03’	Lima & Lima	1998	Acta Botanica Brasilica	12(3)	441-450	

			Cerrado							
13	BA	Entre Barra e Juazeiro	Plantas aquáticas – região da caatinga	10º51’20’’	42º55’45’’	Moura Júnior *et al.*	2011	Rodriguésia	62(4)	731-742
14	BA	Entre Barra e Juazeiro	Plantas aquáticas – região da caatinga	9º46’23’’	42º04’35’’	Moura Júnior *et al.*	2011	Rodriguésia	62(4)	731-742
15	BA	Entre Barra e Juazeiro	Plantas aquáticas – região da caatinga	9º12’51’’	40º58’58’’	Moura Júnior *et al.*	2011	Rodriguésia	62(4)	731-742
16	BA	Senhor do Bonfim	Caatinga	10º28’	40º11’	Ramalho *et al.*	2009	Revista Caatinga	22(3)	182-190
17	BA	Jacobina	Caatinga	11º11’08’’	40º32’10’’	Ramalho *et al.*	2009	Revista Caatinga	22(3)	182-190
18	BA	Barra	Caatinga de areia	10º48’	42º50’	Rocha *et al.*	2004	Revista Brasileira de Botânica	27(4)	739-755
19	CE	Crateús	Carrasco	5º10’	40º56’	Araújo *et al.*	2011	Rodriguésia	62(2)	341-366
20	CE	Crateús	Caatinga	5º08’	40º52’	Araújo *et al.*	2011	Rodriguésia	62(2)	341-366
21	CE	Crateús	Mata seca em área sedimentar	5º08’	40º54’	Araújo *et al.*	2011	Rodriguésia	62(2)	341-366
22	CE	Ubajara	Carrasco	3º54’34’’	40º59’24’’	Araújo *et al.*	1999	Revista Brasileira de Biologia	59(4)	663-678
23	CE	Quixadá	Inselberg-Caatinga	4º57’20’’	39º01’28’’	Araújo *et al.*	2008	Rodriguésia	59(4)	659-671
24	CE	Novo Oriente	Carrasco	5º43’	40º55’	Araújo *et al.*	1998	Revista Brasileira de Botânica	21(2)	105-116
25	CE	Novo Oriente	Carrasco	5º43’	40º55’	Araújo *et al.*	1998	Revista Brasileira de Biologia	58(1)	85-95
26	CE	Novo Oriente	Carrasco	5º43’	40º55’	Araújo *et al.*	1998	Revista Brasileira de Biologia	58(1)	85-95
27	CE	Novo Oriente	Carrasco	5º43’	40º55’	Araújo *et al.*	1998	Revista Brasileira de Biologia	58(1)	85-95
28	CE	Sobral	Caatinga	3º41’	40º20’	Campanha *et al.*	2011	Revista Caatinga	24(3)	94-101
29	CE	Quixadá	Caatinga	4º49’34’’	38º58’90’’	Costa *et al.*	2007	Journal of Arid Environments	68	237-247
30	CE	Aiuaba	Caatinga	6º36’01’’	40º07’15’’	Lemos & Meguro	2010	Revista Brasileira de Biociências	8(1)	34-43

31	CE	Crateús	Mata seca em área sedimentar	5º05’	40º51’	Lima *et al.*	2007	Revista Brasileira de Biociências	5(s.2)	438-440	Lima et al. (2011)
32	CE	Crateús	Mata seca em área sedimentar	5º08’29’’	40º54’51’’	Lima *et al.*	2009	Acta Botanica Brasilica	23(3)	756-763	Araújo et al. (2011)
33	CE	Crateús	Mata seca em área sedimentar	5º08’29’’	40º54’05’’	Lima *et al.*	2011	Rodriguésia	62(2)	379-389	
34	CE	Quixadá	Caatinga	4º58’17’’	39º00’55’’	Santos *et al.*	2008	Revista Verde	3(2)	116-135	
35	CE	Aiuaba	Caatinga	6º34’25’’	40º07’25’’	Souza *et al.*	2007	Cadernos de Cultura e Ciência	2(2)	1-10	
36	CE	Crateús	Carrasco	5º08’45’’	40º55’43’’	Vasconcelos *et al.*	2010	Biodiversity & Conservation	19	2263-2289	
37	MG	Januária	Caatinga arbórea	15º28’	44º23’	Ratter *et al.*	1978	Revista Brasileira de Botânica	1	47-58	
38	MG	Juvenília	Caatinga arbórea	14º24’88’’	44º09’79’’	Santos *et al.*	2011	Cerne	17(2)	247-258	
39	MG	Juvenília	Caatinga arbórea	14º28’22’’	44º11’30’’	Santos *et al.*	2007	Revista Árvore	31(1)	135-144	
40	MG	Juvenília	Caatinga arbórea	14º26’04’’	44º10’67’’	Santos *et al.*	2007	Revista Árvore	31(1)	135-144	
41	MG	Juvenília	Caatinga arbórea	14º24’88’’	44º09’79’’	Santos *et al.*	2007	Revista Árvore	31(1)	135-144	
42	MG	Montalvânia	Caatinga arbórea	14º27’68’’	44º30’58’’	Santos *et al.*	2007	Revista Árvore	31(1)	135-144	
43	MG	Juvenília	Caatinga arbórea	14º29’26’’	44º11’03’’	Santos *et al.*	2007	Revista Árvore	31(1)	135-144	
44	MG	Juvenília	Caatinga arbórea	14º15’93’’	44º06’42’’	Santos *et al.*	2007	Revista Árvore	31(1)	135-144	
45	MG	Juvenília	Caatinga arbórea	14º32’68’’	44º12’63’’	Santos *et al.*	2008	Revista Caatinga	21(4)	154-162	
46	PB	Barra de Santa Rosa	Caatinga	6º43’12’’	36º03’39’’	Almeida Neto *et al.*	2009	Revista Caatinga	22(4)	187-194	
47	PB	Pombal	Caatinga	6º42’10’’	37º45’15’’	Alves *et al.*	2010	Revista Verde	5(2)	152-168	
48	PB	Taperoá	Mata Ciliar	7º12’28’’	36º49’33’’	Andrade *et al.*	2008	Natureza & Conservação	6(2)	61-67	
49	PB	Cuité; Barra de Santa Rosa	Caatinga	6º28’54’’	36º08’58’’	Andrade *et al.*	2010	Acta Scientiarum. Biological Sciences	32(3)	249-255	
50	PB	Pocinhos	Caatinga	7º03’10’’	36º03’06’’	Andrade *et al.*	2007	Revista Brasileira de Ciências Agrárias	2(2)	135-142	

51	PB	São João do Cariri	Caatinga	7º24’	36º32’	Andrade *et al.*	2005	Cerne	11(3)	253-262	
52	PB	São João do Cariri	Caatinga	7º23’30’’	36º31’59’’	Andrade *et al.*	2009	Revista Caatinga	22(1)	229-237	
53	PB	São João do Cariri	Caatinga	7º23’30’’	36º31’59’’	Araujo *et al.*	2010	Revista Caatinga	23(1)	63-70	
54	PB	São José dos Cordeiros	Caatinga	7º28’15’’	36º53’51’’	Barbosa *et al.*	2007	Oecologia Brasiliensis	11(3)	313-322	
55	PB	São João do Cariri	Caatinga	7º23’48’’	36º31’55’’	Barbosa *et al.*	2007	Oecologia Brasiliensis	11(3)	313-322	
56	PB	Pombal	Caatinga	6º42’10’’	37º45’15’’	Dantas *et al.*	2010	Revista Verde	5(1)	134-142	
57	PB	Santa Luzia	Caatinga	6º48’36’’	36º57’38’’	Fabricante & Andrade	2007	Oecologia Brasiliensis	11(3)	341-349	
58	PB	Remígio	Inselberg-Agreste	6º52'48"	35º59'28"	Fevereiro & Fevereiro	1980	Agropecuária Técnica	1(1)	126-131	
59	PB	Vários-Serra Branca como referência	Caatinga	7º29’14’’	36º39’51’’	Gomes	1980	Vegetalia	14	1-27	
60	PB	Patos	Caatinga	7º01’32’’	37º16’41’’	Hayashi & Numata	1976	Tokyo Geography Papers	20	23-44	
61	PB	Vários-São João do Cariri como referência	Mata Ciliar	7º23’27’’	36º32’01’’	Lacerda *et al.*	2005	Acta Botanica Brasilica	19(3)	647-656	Lacerda et al. (2007); parcialmente em Lacerda et al. (2010)
62	PB	Vários- São João do Cariri como referência	Mata Ciliar	7º23’27’’	36º32’01’’	Lacerda *et al.*	2007	Oecologia Brasiliensis	11(3)	331-340	Parcialmente em Lacerda et al. (2010)
63	PB	São José dos Cordeiros	Mata Ciliar	7º26’13’’	36º54’30’’	Lacerda *et al.*	2010	Biota Neotropica	10(4)	275-284	
64	PB	São João do Cariri	Mata Ciliar	7º31’38’’	36º33’06’’	Lacerda *et al.*	2010	Biota Neotropica	10(4)	275-284	

65	PB	São João do Cariri	Mata Ciliar	7º25’33’’	36º29’21’’	Lacerda *et al.*	2010	Biota Neotropica	10(4)	275-284	
66	PB	Lagoa Seca	Transição-Caatinga/Agreste	7º09’52’’	35º51’37’’	Lourenço & Barbosa	2003	Revista Nordestina de Biologia	17(1/2)	23-58	
67	PB	São João do Cariri	Caatinga	7º24’	36º32’	Luna & Coutinho	2007	Revista Caatinga	20(2)	8-15	
68	PB	São João do Cariri	Caatinga	7º21'45"	36º32'00"	Paes-Silva *et al.*	2003	Agropecuária Técnica	24(1)	47-59	
69	PB	Monteiro	Mata Ciliar	7º53’69’’	37º08’67’’	Pegado *et al.*	2006	Acta Botanica Brasilica	20(4)	887-898	
70	PB	Areia	Transição-Caatinga/Agreste	6º53’22’’	35º47’55’’	Pereira *et al.*	2003	Biotropica	35(2)	154-165	
71	PB	Areia; Remígio	Transição-Caatinga/Agreste	6º52’52’’	35º47’42’’	Pereira *et al.*	2002	Acta Botanica Brasilica	16(3)	357-369	Pereira et al. (2003)
72	PB	Areia; Remígio	Transição-Caatinga/Agreste	6º52’52’’	35º47’41’’	Pereira *et al.*	2001	Acta Botanica Brasilica	15(3)	413-426	
73	PB	Esperança	Inselberg-Agreste	7º01’00’’	35º52’50’’	Porto *et al.*	2008	Revista Caatinga	21(2)	214-222	
74	PB	Boqueirão	Transição-Caatinga/Agreste	7º28’49’’	36º08’02’’	Queiroz *et al.*	2006	Revista de Biologia e Ciências da Terra	6(1)	251-259	
75	PB	Boqueirão	Caatinga	7º28’49’’	36º08’02’’	Santos & Melo	2010	Revista Caatinga	23(2)	32-40	
76	PB	Boa Vista; Cabaceiras	Caatinga	7º20’	36º18’	Santos & Santos	2008	Acta Botanica Brasilica	22(4)	1077-1084	
77	PB	Puxinanã	Inselberg-Agreste	7º08'62"	35º58'31"	Tölke *et al.* 2011	2011	Biotemas	24(4)	39-48	
78	PB	Vários-Barra de Santana como ref.	Mata Ciliar	7º31’12’’	35º59’59’’	Trovão *et al.*	2010	Revista Caatinga	23(2)	78-86	
79	PE	Petrolina	Caatinga	9º23’39’’	40º30’34’’	Albuquerque	1999	Journal of Range Management	52(3)	241-248	Albuquerque et al. (2004; 2008)
80	PE	Petrolina	Caatinga	9º23’39’’	40º30’34’’	Albuquerque & Bandeira	1995	Pesquisa Agropecuária	30(6)	885-891	

								Brasileira			
81	PE	Petrolina	Caatinga	9º23’39’’	40º30’34’’	Albuquerque *et al*.	2008	Revista Caatinga	21(4)	17-28	
82	PE	Petrolina	Caatinga	9º23’39’’	40º30’34’’	Albuquerque *et al.*	2004	Sitientibus Série Ciências Biológicas	4(1/2)	52-58	
83	PE	Caruaru	Transição-Caatinga/Agreste	8º14’18’’	35º55’20’’	Alcoforado-Filho *et al*.	2003	Acta Botanica Brasilica	17(2)	287-303	
84	PE	Buíque	Caatinga	8º34’38’’	37º11’50’’	Andrade *et al.*	2004	Hoehnea	31(3)	337-348	
85	PE	Brejo da Madre de Deus	Caatinga	8º09’00’’	36º19’15’’	Andrade *et al.*	2009	Revista de Geografia	26(2)	161-184	
86	PE	Petrolina	Mata Ciliar	9º05’49’’	40º17’01’’	Aranha *et al*.	2010	Revista do Instituto Florestal	22(1)	1-14	
87	PE	Floresta	Caatinga	8º30’	38º00’	Araújo *et al*.	1995	Revista Brasileira de Biologia	55(4)	595-607	
88	PE	Floresta	Caatinga	8º37’	38º17’	Araújo *et al*.	1995	Revista Brasileira de Biologia	55(4)	595-607	
89	PE	Custódia	Caatinga	8º06’	37º19’	Araújo *et al*.	1995	Revista Brasileira de Biologia	55(4)	595-607	
90	PE	Caruaru	Transição-Caatinga/Agreste	8º14’	35º55’	Araújo *et al*.	2005	Acta Botanica Brasilica	19(2)	285-294	Reis et al. (2006)
91	PE	Petrolina	Caatinga	9º23’39’’	40º30’34’’	Calixto Jr. & Drumond	2011	Revista Caatinga	24(2)	67-74	
92	PE	Serra Talhada	Caatinga	7º49’	38º11’	Cantalice *et al.*	2008	Revista Caatinga	21(4)	201-211	
93	PE	Betânia/Floresta	Caatinga	8º18’45’’	38º11’43’’	Costa *et al*.	2009	Revista Brasileira de Ciências Agrárias	4(1)	48-54	
94	PE	Petrolina	Caatinga	9º23’39’’	40º30’34’’	Drumond *et al*.	2002	Brasil Florestal	74	37-43	
95	PE	Serra Talhada	Caatinga	7º57’	38º17’	Ferraz *et al*.	2003	Phytocoenologia	33(1)	71-92	
96	PE	Serra Talhada	Caatinga	7º59’	38º19’	Ferraz *et al*.	2003	Phytocoenologia	33(1)	71-92	
97	PE	Serra Talhada	Caatinga	7º57’	38º17’	Ferraz *et al*.	1998	Revista Brasileira de Botânica	21(1)	7-15	
98	PE	Serra Talhada	Caatinga	7º59’	38º19’	Ferraz *et al*.	1998	Revista Brasileira	21(1)	7-15	

								de Botânica		
99	PE	Floresta	Mata Ciliar	8º35’60’’	38º34’05’’	Ferraz *et al*.	2006	Acta Botanica Brasilica	20(1)	125-134
100	PE	Buíque	Caatinga	8º24’11’’	37º21’30’’	Figueiredo *et al*.	2000	Naturalia	25	205-224
101	PE	Buíque	Caatinga	8º35’	37º15’	Gomes *et al*.	2006	Acta Botanica Brasilica	20(1)	37-48
102	PE	Bezerros	Inselberg-Agreste	8º20’	35º50’	Gomes & Alves	2009	Edinburgh Journal of Botany	66(2)	329-346
103	PE	São Joaquim do Monte	Inselberg-Agreste	8º22’55’’	35º50’38’’	Gomes & Alves	2010	Revista Brasileira de Botânica	33(4)	661-676
104	PE	Altinho/Agrestina	Inselberg-Agreste	8º23’29’’	36º00’37’’	Gomes & Alves	2010	Revista Brasileira de Botânica	33(4)	661-676
105	PE	Venturosa	Inselberg-Agreste	8º34’30’’	36º52’45’’	Gomes *et al.*	2011	Check List	7(2)	173-181
106	PE	Cumarú	Plantas aquáticas - região do Agreste	7º58’02’’	35º44’33’’	Lima *et al*.	2011	Rodriguésia	62(4)	771-783
107	PE	Pedra	Plantas aquáticas – região da caatinga s	8º33’33’’	36º59’07’’	Lima *et al*.	2011	Rodriguésia	62(4)	771-783
108	PE	Petrolina	Mata Ciliar	9º02’	40º14’	Nascimento *et al*.	2003	Revista Brasileira de Botânica	26(3)	271-287
109	PE	Betânia; Floresta	Caatinga	8º18’43’’	38º11’45’’	Pessoa *et al*.	2004	Revista Nordestina de Biologia	18(1)	27-53
110	PE	Mirandiba	Caatinga	8º03’35’’	38º43’07’’	Pinheiro & Alves	2007	Revista Brasileira de Biociências	5(sup)	426-428
111	PE	Mirandiba	Caatinga	8º04’10’’	38º44’20’’	Pinheiro *et al*.	2010	Revista Caatinga	23(2)	68-77
112	PE	Caruaru	Transição-Caatinga/Agreste	8º14’	35º55’	Reis *et al.*	2006	Revista Brasileira de Botânica	29(3)	497-508
113	PE	Buíque	Caatinga	8º37’14’’	37º09’23’’	Rodal *et al.*	1998	Revista Brasileira de Biologia	58(3)	517-526
114	PE	Floresta; Betânia	Caatinga	8º18’43’’	38º11’45’’	Rodal *et al.*	2008	Hoehnea	35(2)	209-217
115	PE	Floresta	Caatinga	8º30’	38º00’	Rodal *et al.*	2008	Revista Caatinga	21(3)	192-205
116	PE	Floresta	Caatinga	8º37’	38º17’	Rodal *et al.*	2008	Revista Caatinga	21(3)	192-205

117	PE	Custódia	Caatinga	8º05’25’’	37º39’05’’	Rodal *et al.*	2008	Revista Caatinga	21(3)	192-205
118	PE	Custódia	Caatinga	8º05’25’’	37º39’05’’	Rodal *et al.*	2008	Revista Caatinga	21(3)	192-205
119	PE	Ibimirim	Caatinga	8º39’	37º35’	Rodal *et al.*	1999	Acta Botanica Brasilica	13(1)	15-28
120	PE	Serra Talhada	Caatinga	7º59’00’’	38º19’16’’	Sampaio *et al*.	1993	Biotropica	25(4)	452-460
121	PE	Floresta	Caatinga	8º35’27’’	38º32’02’’	Santos *et al*.	2009	Rodriguésia	60(2)	389-402
122	PE	Petrolândia	Caatinga	9º04’57’’	38º13’47’’	Silva *et al*.	2009	Acta Botanica Brasilica	23(1)	100-110
123	PE	Petrolândia	Caatinga	9º05’27’’	38º13’43’’	Silva *et al*.	2009	Acta Botanica Brasilica	23(1)	100-110
124	PE	Floresta	Mata Ciliar	8º34’26’’	38º32’45’’	Souza & Rodal	2010	Revista Caatinga	23(4)	54-62
125	PI	Campo Maior; Jatobá do Piauí	Transição Caatinga/Cerrado	4º49’42’’	42º10’11’’	Barros & Castro	2006	Interações	8(13)	119-130
126	PI	?	Caatinga	8º50’	43º00’	Emperaire	1987	Bull. Ecol.	18(4)	431-438
127	PI	Campo Maior	Transição Caatinga/Cerrado	4º52’	42º03’	Farias & Castro	2004	Acta Botanica Brasilica	18(4)	949-963
128	PI	Vários-S.R. Nonato como referência	Caatinga	8º26’50’’	42º19’47’’	Lemos	2004	Rodriguésia	55(85)	55-66
129	PI	Vários-S.R. Nonato como referência	Caatinga	8º44’01’’	42º29’21’’	Lemos & Rodal	2002	Acta Botanica Brasilica	16(1)	23-42
130	PI	São José do Piauí	Caatinga	6º51’13’’	41º28’15’’	Mendes & Castro	2010	Check List	6(1)	39-44
131	PI	Padre Marcos	Transição Caatinga/Carrasco	7º07’	40º58’	Oliveira *et al*.	1997	Naturalia	22	131-150
132	RN	Serra Negra do Norte	Caatinga	6º35’	37º20’	Amorim *et al*.	2005	Acta Botanica Brasilica	19(3)	615-623
133	RN	Carnaúba dos Dantas	Caatinga	6º32’56’’	36º35’34’’	Andrade *et al*.	2009	Acta Botanica Brasilica	23(4)	935-943
134	RN	Acari	Caatinga	6º27’35’’	36º38’27’’	Andrade *et al*.	2009	Acta Botanica Brasilica	23(4)	935-943

135	RN	Caraúbas	Caatinga	5º43'14''	37º42'22''	Benevides *et al.*	2007	Revista Verde	2(1)	33-44	
136	RN	Carnaubais	Caatinga e Mata Ciliar	5º18'14''	36º58'44''	Cavalcanti & Rodal	2010	Revista Caatinga	23(2)	41-50	
137	RN	Serra do Mel	Caatinga costeira	5º10'12''	37º01'46''	Cezar *et al.*	2006	Revista Verde	1(2)	100-112	
138	RN	Vários-Jardim do Seridó como referência	Caatinga	6º38'40''	36º47'02''	Costa *et al.*	2009	Revista Brasileira de Engenharia Agrícola e Ambiental	13	961-974	
139	RN	Messias Targino	Caatinga	6º08'	37º26'	Freitas *et al.*	2007	Revista Verde	2(1)	135-147	
140	RN	Açu	Caatinga	5º34'20''	36º54'33''	Lira *et al.*	2007	Agropecuária Científica no Semi-Árido	3	23-30	
141	RN	Serra do Mel	Caatinga	5º10'12''	37º01'46''	Maracajá *et al.*	2003	Revista de Biologia e Ciências da Terra	3(2)	Sem numeração	
142	RN	Caraúbas	Caatinga	5º43'14''	37º42'22''	Maracajá & Benevides	2006	Revista de Biologia e Ciências da Terra	6(1)	165-175	Benevides et al. (2007)
143	RN	Açu	Caatinga	5º34'20''	36º54'33''	Miranda *et al.*	2007	Agropecuária Científica no Semi-Árido	3	31-43	
144	RN	Caraúbas	Caatinga	5º47'33''	37º33'24''	Moreira *et al.*	2007	Revista Verde	2(1)	113-126	
145	RN	Apodi	Caatinga	5º32'16''	37º53'44''	Pessoa *et al.*	2008	Revista Caatinga	21(3)	40-48	
146	RN	Serra Negra do Norte	Caatinga	6º39'46''	37º24'01''	Santana *et al.*	2009	Revista Verde	4(4)	83-89	
147	RN	Serra Negra do Norte	Caatinga	6º39'46''	37º24'01''	Santana & Souto	2006	Revista de Biologia e Ciências da Terra	6(2)	232-242	Santana et al. (2009)
148	RN	Jucurutú	Caatinga	5º57'06''	36º56'41''	Santos *et al.*	2006	Revista Verde	1(2)	86-99	
149	RN	Bento Fernandes	Caatinga	5º41'38''	35º49'11''	Silva *et al.*	2008	Revista Verde	3(4)	47-57	
150	RN	Messias Targino	Caatinga	6º08'	37º26'	Sizenando Filho *et al.*	2007	Revista de Biologia e Ciências da Terra	7(2)	?	

Anexo 2- Caracterização dos 150 levantamentos florísticos ou fitossociológicos compilados para a região do semiárido brasileiro (domínio fitogeográfico da Caatinga). *Multi área* indica quando um trabalho traz mais de uma lista de espécies, que podem ser fundidas ou separadas, dependendo do interesse do leitor. *Flora Le*: indica que o trabalho traz uma lista da flora lenhosa da área; *Flora He*: indica que o trabalho traz uma lista da flora herbácea da área; *Fito Le*: indica que há dados de estrutura voltados ao componente lenhoso; *Fito He*: indica que há dados de estrutura voltados ao componente herbáceo; *Fito Roc*: indica que há dados de estrutura voltados a ambientes rochosos, onde lenhosas e herbáceas são amostradas pelas mesmas unidades amostrais; *Fito Reg*: indica que há dados de estrutura voltados às plantas regenerantes; *Método fito*: método fitossociológico aplicado ao estudo do componente lenhoso; *Área (ha)*: área amostral, em hectares, utilizada em estudos com parcelas voltado ao componente lenhoso; *Nº pq*: número de pontos quadrantes utilizados em estudos fitossociológicos voltados ao componente lenhoso; *CI*: critério de inclusão adotado por estudos fitossociológicos voltados ao componente lenhoso; *Abd.*: Abundância; se refere ao número de indivíduos vivos amostrados por cada levantamento de fitossociologia voltado ao componente lenhoso; *Den (ha)*: Densidade, por hectare, em cada área onde há dados de estrutura voltada ao componente lenhoso (os valores reportados aqui eventualmente diferem dos informados nos trabalhos originais porque recontamos o número de indivíduos nas tabelas considerando apenas as plantas vivas, enquanto alguns autores computaram as mortas no cálculo da densidade); Ab m2/ha: área basal total (dominância) da comunidade, em m2/ha (quando levantamentos menores foram fundidos em um maior – levantamentos marcados como Multi área- tirou-se a média das dominâncias das subáreas para se obter a dominância do total); *Riq fito*: Riqueza de espécies registrada por cada levantamento fitossociológico voltado ao componente lenhoso; *Riq total*: Riqueza total de espécies registradas por cada trabalho, somando-se todas as espécies reportadas em tabelas fitossociológicas voltadas para o componente lenhoso, tabelas fitossociologicas voltadas ao componente herbáceo, tabelas de espécies regenerantes e tabelas florísticas. Valores em branco indicam que a riqueza total é igual à riqueza fitossociológica. * indica que o trabalho traz uma lista florística ou fitossociológica para a respectiva categoria da tabela; *a.p.*: o trabalho faz adições pontuais de espécies à florística da área, mas o foco do trabalho é fitossociológico; *T*: o trabalho trás uma tabela fitossociológica, mas ela está truncada e não é possível obter os dados de estrutura para todas as espécies; *P*: o trabalho pretende fornecer dados de fitossociologia, mas pela organização dos dados não é possível resgatar a abundância e densidade das espécies para comparações; *Abu*: Fitossociologia que informa apenas a densidade ou abundância das plantas, omitindo outros dados de estrutura, ou apresenta os outros dados de estrutura em uma forma em que os valores absolutos de freqüência e dominância não podem ser resgatados para comparações; *DNS*: diâmetro ao nível do solo; *DAP*: diâmetro à altura do peito (1,3m); *PNS*: perímetro ao nível do solo; *PAP*: perímetro à altura do peito (1,3m); *?*: dados não informados pelos autores. O código de cada área (Cod. área) é o mesmo entre os anexos 1 e 2. Autores que desejem utilizar esses dados em comparações devem avaliar a utilidade de cada trabalho individualmente para seus propósitos, pois parte dos levantamentos listados aqui são de áreas degradadas, com riqueza de espécies e área basal diminuídas. Ademais, os levantamentos marcados no campo “Multi área” podem ser mais apropriados para comparações se forem desmembrados em áreas menores, usando seus respectivos valores sociológicos individuais.

Cod. área	UF	Multi área	Flora Le	Flora He	Fito Le	Fito He	Fito Roc	Fito Reg	Método fito	Área (ha)	Nº pq	CI	Abd.	Den (ha)	Ab m2/ha	Riq fito	Riq total
1	BA		*	*					-	-	-	-	-	-	-	-	32
2	BA		*	*					-	-	-	-	-	-	-	-	46
3	BA		*	*					-	-	-	-	-	-	-	-	40
4	BA		*	*					-	-	-	-	-	-	-	-	30
5	BA		*	*					-	-	-	-	-	-	-	-	51
6	BA		*	*					-	-	-	-	-	-	-	-	47
7	BA						*		-	-	-	-	-	-	-	34	-
8	BA		*	*					-	-	-	-	-	-	-	-	48
9	BA		*	*					-	-	-	-	-	-	-	-	180
10	BA		*	*					-	-	-	-	-	-	-	-	196
11	BA	*	*	*					-	-	-	-	-	-	-	-	112
12	BA		*		T				Parcelas	1	-	DAP 5cm	2897	2897	-	-	71
13	BA	*	*	*					-	-	-	-	-	-	-	-	21
14	BA	*	*	*					-	-	-	-	-	-	-	-	21
15	BA	*	*	*					-	-	-	-	-	-	-	-	30
16	BA		*						-	-	-	-	-	-	-	-	52
17	BA		*						-	-	-	-	-	-	-	-	62
18	BA		*	*	Abu				quadrantes	-	210	Altura	832	1083	-	22	85
19	CE		*	*					-	-	-	-	-	-	-	-	136
20	CE		*	*					-	-	-	-	-	-	-	-	137
21	CE		*	*					-	-	-	-	-	-	-	-	250
22	CE				*				parcelas	1	-	DNS 3cm	4254	4254	?	74	-

23	CE		*	*				-	-	-	-	-	-	-	-	77
24	CE	*	*	*				-	-	-	-	-	-	-	-	184
25	CE				*			parcelas	0,25	-	DNS 3cm	1429	5716	14,2	49	-
26	CE				*			parcelas	0,25	-	DNS 3cm	1411	5644	27,7	54	-
27	CE				*			parcelas	0,25	-	DNS 3cm	1590	6360	19,5	49	-
28	CE	*			*			parcelas	0,3	-	DNS 3cm	393	1310	5,46	16	-
29	CE		*	*				-	-	-	-	-	-	-	-	133
30	CE		*	*				-	-	-	-	-	-	-	-	160
31	CE				*			parcelas	1	-	PNS 9cm	5683	5683	47	88	-
32	CE		*	*				-	-	-	-	-	-	-	-	104
33	CE				*	*	*	parcelas	1	-	PNS 9cm	-	5683	47	88	102
34	CE	*			*			parcelas	0,48	-	PAP 12cm	924	1925	6,29	25	-
35	CE		a.p.		T			parcelas	0,4	-	DNS 3cm	-	-	?	?	27
36	CE				Abu			parcelas	0,5	-	PNS 9cm	2790	5580	?	39	-
37	MG		*					-	-	-	-	-	-	-	-	42
38	MG		*		*			parcelas	0,8	-	PAP 10cm	1322	1652.5	16,10	47	64
39	MG	*	*					-	-	-	-	-	-	-	-	59
40	MG	*	*					-	-	-	-	-	-	-	-	36
41	MG	*	*					-	-	-	-	-	-	-	-	40
42	MG	*	*					-	-	-	-	-	-	-	-	34
43	MG	*	*					-	-	-	-	-	-	-	-	37
44	MG	*	*					-	-	-	-	-	-	-	-	37
45	MG	*	*		*			parcelas	0,4	-	PAP	723	1807.5	19,25	33	44

											10cm					
46	PB				*			parcelas	0,99	-	DNS 3cm	2850	2879	12,12	22	-
47	PB						P	-	-	-	-	-	-	-	-	13
48	PB				P			parcelas	0,8	-	Hábito	3176	3970	?	42	-
49	PB				P		P	parcelas	0,4	-	DNS 3cm	-	-	?	39	-
50	PB				*		*	parcelas	0,4	-	DNS 3cm	885	2212.5	23,85	37	45
51	PB	*			*			parcelas	0,48	-	PNS 10cm	920	1916.67	18,79	17	-
52	PB	*		*		T		-	-	-	-	-	-	-	-	40
53	PB		*		P			-	-	-	-	-	-	-	-	14
54	PB		*		*			parcelas	0,5	-	DNS 3cm	1940	3880	16,93	20	67
55	PB		*		*			parcelas	0,108	-	DNS 3cm	304	2814.81	12,01	12	26
56	PB				*			parcelas	1	-	PAP 6cm	2756	2756	11,55	23	-
57	PB				*		*	parcelas	0,4	-	DNS 3cm	1252	3130	22,74	20	20
58	PB		*	*				-	-	-	-	-	-	-	-	27
59	PB	*	*	a.p.	T			parcelas	1	-	Diâmetro 5cm	-	-	?	-	40
60	PB	*			*			parcelas	0,04	-	Altura	363	9075	4,39	27	-
61	PB	*	*					-	-	-	-	-	-	-	-	43
62	PB	*	*					-	-	-	-	-	-	-	-	62
63	PB		*					-	-	-	-	-	-	-	-	68
64	PB		*					-	-	-	-	-	-	-	-	63
65	PB		*					-	-	-	-	-	-	-	-	56
66	PB		*	*				-	-	-	-	-	-	-	-	125
67	PB	*		a.p.	*			parcelas	0,32	-	DNS 3cm	746	2331.25	11,77	11	15

68	PB	*	*	a.p.				-	-	-	-	-	-	-	-	33
69	PB	*			*		*	parcelas	0,8	-	DNS 3cm	968	1210	19,49	39	49
70	PB	*	a.p.		*			parcelas	1,2	-	DNS 3cm	3278	2732	22	53	57
71	PB		a.p.		*			parcelas	0,6	-	DNS 3cm	3111	5185	34,77	49	55
72	PB	*					*	-	-	-	-	-	-		26	-
73	PB		*	*				-	-	-	-	-	-	-	-	127
74	PB				*			parcelas	0,2	-	DNS 3cm	508	2540	Provavel mente 30,5	28	-
75	PB		*	*				-	-	-	-	-	-	-	-	47
76	PB				Abu			parcelas	0,4	-	DNS 3cm	2359	5897.5	-	22	-
77	PB		*	*				-	-	-	-	-	-	-	-	97
78	PB	*			*			parcelas	0,24	-	DNS 3cm	357	1487.5	?	17	-
79	PE				T	P	T	quadrante composto	-	450	Altura	-	-	-	?	?
80	PE				T	P	T	parcelas	0,174	-	Altura	1754	10080.7	?	23	43
81	PE	*			T		T	quadrante composto	-	450	Altura	?	1196.25	?	36	-
82	PE					P	T	-	-	-	-	-	-	-	-	31
83	PE		*	*	*			parcelas	0,72	-	DNS 3cm	2246	3119.4	24,9	55	97
84	PE		*	*				-	-	-	-	-	-	-	-	158
85	PE				*			parcelas	1	-	DNS 3cm	2828	2828	19,46	32	-
86	PE				*		*	parcelas	0,54	-	DNS 3cm	131	242.6	6,01	24	32
87	PE		a.p.		*			quadrantes	-	100	PNS 5cm	388	5385	31,8	22	28
88	PE		a.p.		*			quadrantes	-	100	PNS	373	3023	19,8	27	35

											5cm					
89	PE		a.p.		*			quadrantes	-	100	PNS 5cm	370	3975	32,5	25	29
90	PE	*		*		*		-	-	-	-	-	-	-	-	62
91	PE				*			parcelas	0,32	-	DAP 3cm	432	1350	7,28	16	-
92	PE				*			quadrante composto	-	10	DNS 3cm	79	1327.5	?	11	-
93	PE		*	*				-	-	-	-	-	-	-	-	101
94	PE				*			parcelas	2	-	DAP 5cm	723	361.5	?	21	-
95	PE				*			parcelas	0,1	-	DNS 3cm	359	3590	52,4	22	-
96	PE				*			parcelas	0,2	-	DNS 3cm	707	3535	30,6	34	-
97	PE		*					-	-	-	-	-	-	-	-	34
98	PE		*					-	-	-	-	-	-	-	-	43
99	PE		*		P			parcelas	0,96	-	PAP 10cm	-	-	32,03	-	24
100	PE		*	*	*			quadrantes	-	100	DNS 3cm	361	1824	8,2	33	120
101	PE		*	*				-	-	-	-	-	-	-	-	192
102	PE		*	*				-	-	-	-	-	-	-	-	201
103	PE		*	*			*	-	-	-	-	-	-		-	154
104	PE		*	*			*	-	-	-	-	-	-		-	125
105	PE		*	*				-	-	-	-	-	-	-	-	125
106	PE		*	*				-	-	-	-	-	-		-	26
107	PE		*	*				-	-	-	-	-	-		-	27
108	PE	*	a.p.		*			parcelas	1,4	-	DNS 3cm	2108	1505.7	18,7	39	48
109	PE			*				-	-	-	-	-	-	-	-	54
110	PE				*			parcelas	0,16	-	DNS 3cm	518	3237.5	?	18	-

111	PE	*	*	*				-	-	-	-	-	-	-	-	150
112	PE	*		*		*		-	-	-	-	-	-	-	-	71
113	PE		*		*			quadrantes	-	100	DNS 3cm	343	2207.7	6,07	35	45
114	PE				*			parcelas	1	-	DNS 3cm	3140	3140	18,5	28	-
115	PE	*	a.p.		*			parcelas	0,25	-	DNS 3cm	469	1876	16,51	23	27
116	PE	*	a.p.		*			parcelas	0,25	-	DNS 3cm	543	2172	14,62	26	28
117	PE	*	a.p.		*			parcelas	0,25	-	DNS 3cm	269	1076	34,29	23	27
118	PE	*	a.p.		*			parcelas	0,25	-	DNS 3cm	468	1872	20,28	29	31
119	PE		*	*				-	-	-	-	-	-	-	-	139
120	PE				T			parcelas	0,05	-	DNS 1cm	-	-		-	-
121	PE	*			Abu	Abu	*	parcelas	0,42	-	Altura	223	532	-	11	65
122	PE			*		P		-	-	-	-	-	-	-	-	78
123	PE	*		*		P		-	-	-	-	-	-	-	-	69
124	PE	*	*	*				-	-	-	-	-	-	-	-	78
125	PI	*	*					-	-	-	-	-	-	-	-	115
126	PI	*	*					-	-	-	-	-	-	-	-	79
127	PI	*	*		*			quadrantes	-	200	DNS 3cm	400	2764.5	38,4	46	68
128	PI	*	*	*				-	-	-	-	-	-	-	-	210
129	PI				*			parcelas	1	-	DNS 3cm	5655	5655	31,9	56	-
130	PI		*	*				-	-	-	-	-	-	-	-	136
131	PI		*	*	*			parcelas	0,45	-	DNS 3cm	2078	4617.78	24,2	57	81
132	RN				*			parcelas	1	-	PAP 3cm	3247	3247	6,1	15	-

133	RN	*	*		*	parcelas	0,8	-	DNS 3cm	1166	1457.5	3,3	35	41
134	RN	*	*		*	parcelas	0,8	-	DNS 3cm	1527	1908.75	2,8	17	19
135	RN	*		*		-	-	-	-	-	-		-	37
136	RN	*	P		P	parcelas	0,3	-	DNS 3cm	?	?	?	29	-
137	RN	*	*			parcelas	0,48	-	PNS 12cm	411	856.25	?	15	-
138	RN	*	*			quadrantes	-	868	DNS 1cm	3472	?	?	31	-
139	RN	*	*			parcelas	0,48	-	DNS 3cm	684	1425	?	12	-
140	RN	*	*			parcelas	0,48	-	PNS 10cm	304	633.33	?	21	-
141	RN		*			parcelas	0,48	-	PNS 10cm	581	1210.42	?	17	-
142	RN	*		*		-	-	-	-	-	-		-	37
143	RN	*		*		-	-	-	-	-	-	-	-	38
144	RN	*	*			parcelas	0,48	-	PNS 12cm	398	829.5	10,7	11	-
145	RN		*			parcelas	0,48	-	PNS 10cm	374	779.17	-	11	-
146	RN		*			parcelas	0,6	-	DNS 3cm	2448	4080	?	22	-
147	RN		*			parcelas	0,6	-	DNS 3cm	2448	4080	17,5	22	-
148	RN	*		*		-	-	-	-	-	-	-	-	47
149	RN	*	*			parcelas	0,48	-	DNS 3cm	281	585.42	?	22	-
150	RN	*		*		-	-	-	-	-	-	-	-	18

Anexo 3- Levantamentos florísticos ou fitossociológicos na região do semiárido brasileiro (domínio fitogeográfico da Caatinga) publicados em boletins técnicos

N°	Autores	Ano	Título	Publicação
1	Tavares, S., Paiva, F.A.F., Tavares, E.J.S. & Lima, J.L.S.	1969	Inventário florestal do Ceará: estudo preliminar das matas remanescentes do município de Quixadá	Boletim de Recursos Naturais. SUDENE, 7, 93-111.
2	Tavares, S., Paiva, F.A.F., Tavares, E.J.S., Neves, M.A. & Carvalho, G.H.	1969	Inventário florestal de Pernambuco I. Estudo preliminar das matas remanescentes do município de São José do Belmonte	Boletim de Recursos Naturais. SUDENE, 7, 113-139.
3	Tavares, S., Paiva, F.A.F., Tavares, E.J.S., Carvalho, G.H. & Lima, J.L.S.	1970	Inventário florestal de Pernambuco. Estudo preliminar das matas remanescentes dos municípios de Ouricuri, Bodocó, Santa Maria da Boa Vista e Petrolina	Boletim de Recursos Naturais. SUDENE, 8, 149-194.
4	Carvalho, G.H.	1971	Contribuição para a determinação da reserva madeireira no Sertão Central do estado de Pernambuco	Boletim de Recursos Naturais. SUDENE, 9, 289-312.
5	Tavares, S., Paiva, F.A.F., Carvalho, G.H., Tavares, E.J.S., Machado, O.F., Lima, J.L.S. & Souza, S.A.	1971	Inventário florestal em Alagoas: contribuição para o potencial madeireiro dos municípios de São Miguel dos Campos, Chão do Pilar, Colônia de Leopoldina e União dos Palmares	Boletim de Recursos Naturais. SUDENE, 9, 123-231.
6	Tavares, S., Paiva, F.A.F., Tavares, E.J.S., Neves, M.A. & Lima, J.L.S.	1971	Inventário florestal de Alagoas I. Nova contribuição para o estudo preliminar das matas remanescentes do estado de Alagoas	Boletim de Recursos Naturais. SUDENE, 9, 5-122.
7	Souza Sobrinho, J.	1974	Contribuição à determinação do potencial madeireiro do Vale do Jaguaribe, Estado do Ceará.	Boletim de Recursos Naturais. SUDENE, 12, 91-120.
8	Tavares, S., Paiva, F.A.F., Tavares, E.J.S. & Lima, J.L.S.	1974	Inventário florestal do Ceará II. Estudo preliminar das matas remanescentes do município de Tauá	Boletim de Recursos Naturais. SUDENE, 12, 5-19.
9	Tavares, S., Paiva, F.A.F., Tavares, E.J.S. & Lima, J.L.S.	1974	Inventário florestal do Ceará III. Estudo preliminar das matas remanescentes do município de Barbalha	Boletim de Recursos Naturais. SUDENE1, 12, 20-46.
10	Tavares, S., Paiva, F.A.F., Tavares, E.J.S. & Carvalho, G.H.	1975	Inventário florestal na Paraíba e no Rio Grande do Norte I. Estudo preliminar das matas remanescentes do vale do Piranhas.	SUDENE. Série Recursos Vegetais, 3.
11	Tavares, S., Paiva, F.A.F., Tavares, E.J.S., Lima, J.L.S. & Carvalho, G.H.	1975	Inventário florestal na Paraíba e no Rio Grande do Norte. I: estudo preliminar das matas remanescentes do Vale do Piranhas	SUDENE. Série Recursos Naturais, 3, 5-31.
12	Tavares, S., Tavares, E.J.S., Paiva, F.A.F. & Carvalho, G.H.	1975	Nova contribuição para o inventário florestal de Alagoas.	SUDENE. Série Recursos Vegetais, 1.

13	Carvalho, G.H., Carvalho, M.L.R., Leite, C.R. & Neri, A.F.O.	1979	Contribuição para a determinação da potencialidade madeireira da bacia do São Francisco - estado da Bahia.	SUDENE. Série Recursos Vegetais, 8.
14	Albuquerque, S.G., Soares, J.G.G. & Araújo Filho, J.A.	1982	Densidade de espécies arbóreas e arbustivas em vegetaçao de caatinga	EMBRAPA-CPATSA. Pesquisa em Andamento, 16.
15	Drumond, M.A., Lima, P.C.F., Souza, S.M. & Lima, J.L.S.	1982	Sociabilidade das espécies florestais da Caatinga em Santa Maria da Boa Vista-PE	Boletim de Pesquisa Florestal, 4, 47-59.
16	Fotius, G.A. & Sá, I.B.	1985	Esboço da vegetação da bacia hidrográfica do Sipaúba, Bodocó, PE	EMBRAPA-CPATSA. Documentos, 29.
17	Fotius, G.A. & Sá, I.B.	1988	Prospecção botânica em área de exploração petrolífera, no município de Pendências, RN	EMBRAPA-CPATSA. Documentos, 47.

Anexo 4- Levantamentos florísticos ou fitossociológicos na região do semiárido brasileiro (domínio fitogeográfico da Caatinga) publicados em livros e capítulos de livro.

N°	Autores	Ano	Referência
1	Araújo, F.S. de, Costa, R.C. da, Figueiredo, M.A. & Nunes, E.P.	2005	Vegetação e flora fanerogâmica da área Reserva Serra das Almas, Ceará. *In:* Análise das variações da biodiversidade do bioma Caatinga. (eds F.S. de Araújo, M.J.N. Rodal & M.R. de V. Barbosa), pp. 91-119. Ministério do Meio Ambiente, Brasília.
2	Barbosa, M.R. de V., Lima, R.B. de, Agra, M. de F., Cunha, J.P. da & Pessoa, M. do C.R.	2005	Vegetação e flora fanerogâmica do Curimataú, Paraíba. *In:* Análise das variações da biodiversidade do bioma Caatinga. (eds F.S. de Araújo, M.J.N. Rodal & M.R. de V. Barbosa), pp. 121-138. Ministério do Meio Ambiente, Brasília.
3	Castro, A.A.J.F., Printz, A., Mendes, M.R. de A., Soares, F. de A.R., Oliveira, J.O.S., Albino, R.S., Lange, F.-M. & Farias, R.R.S. de.	2003	Cerrado and Caatinga in the Picos area. *In:* Global change and regional impacts: water availability and vulnerability of ecosystems and society in the semiarid Northeast Brazil (eds T. Gaiser, M. Krol, H. Frischkorn & J.C. de Araújo), pp. 323-333. Springer, Berlin.
4	Fabricante, J.R. & Andrade, L.A. de.	2007	Relações sinecológicas da faveleira - Cnidoscolus phyllacanthus (Mul. Arg.) Pax L. Hoffm. na Caatinga. *In:* Ecologia da faveleira na Caatinga: bases para a exploração como lavoura xerófila. pp. 1-132. Impressos Adilson, Campina Grande.
5	Farias, R.R.S. de, Castro, A.A.J.F. & Mendes, M.R. de A.	2010	Estudo Florístico em Trechos de Vegetação do Complexo de Campo Maior, Jatobá do Piauí (PI, Brasil). *In:* Biodiversidade e ecótonos da região setentrional do Piauí (eds A.A.J.F. Castro, N.M.C.F. Castro & C. Arzabe), pp. 44-65. Editora da Universidade Federal do Piauí, Teresina.
6	Figueiredo, M.A.	1987	A microregião salineira norte-riograndense no domínio das caatingas. Escola Superior de Agricultura de Mossoró. Coleção Mossoroense, Mossoró.
7	Figueiredo, M.A.	1983	A região dos Inhamuns-CE no domínio das Caatingas. Escola Superior de Agricultura de Mossoró. Coleção Mossoroense, Mossoró.
8	Gadelha-Neto, P. da C. & Barbosa, M.R.V.	2000	Levantamento florístico e fitossociológico em um remanescente de Caatinga no município de Souza, Paraíba. *In:* Iniciados (ed M.F.V. Souza), pp. 64-87. Editora da Universidade Federal da Paraíba, João Pessoa.
9	Leal, I. R., Vicente, A. & Tabarelli, M.	2003	Herbivoria por caprinos na Caatinga da região de Xingó: uma análise preliminar. *In:* Ecologia e conservação da Caatinga (eds. Leal, I.R.,

			Tabarelli, M., Silva, JM.C.), pp. 695-715. Editora da Universidade Federal de Pernambuco, Recife.
10	Lima, M.M. de, Monteiro, R., Castro, A.A.J.F. & Costa, J.M. da.	2010	Levantamento florístico e fitossociológico do morro do Cascudo, área de entorno do Parque Nacional de Sete cidades (PN7C), Piauí, Brasil. *In*: Biodiversidade e ecótonos da região setentrional do Piauí (Castro, A.A.J.F., Castro, N.M.C.F., Arzabe, C.). pp. 186-207. Editora da Universidade Federal do Piauí, Teresina.
11	Oliveira, J.G.B. de, Quesado, H.L.C., Nunes, E.P., Figueiredo, M.A. & Bezerra, C.L.F.	1988	Vegetação da estação ecológica de Aiuaba, Ceará. Escola Superior de Agricultura de Mossoró. Coleção Mossoroense, Mossoró.
12	Queiroz, L.P. de, França, F., Giulietti, A.M., Melo, E. de, Gonçalves, C.N., Funch, L.S., Harley, R.M., Funch, R.R. & Silva, T.S.	2005	Caatinga. *In:* Biodiversidade e conservação da Chapada Diamantina. (eds F.A. Juncá, L. Funch & W. Rocha), pp. 95-120. Ministério do Meio Ambiente, Brasília.
13	Rodal, M.J.N., Lins e Silva, A.C.B., Pessoa, L.M. & Cavalcanti, A. de D.C.	2005	Vegetação e flora fanerogâmica da área de Betânia, Pernambuco. *In:* Análise das variações da biodiversidade do bioma Caatinga. (eds F.S. de Araújo, M.J.N. Rodal & M.R. de V. Barbosa), pp. 139-166. Ministério do Meio Ambiente, Brasília.
14	Roque, A.A., Queiroz, R.T. de & Loiola, M.I.B.	2009	Diversidade Florística do Seridó Potiguar. In: Recursos Naturais das caatingas: uma visão multidisciplinar. pp. 11-49. Editora da Universidade Federal do Rio Grande do Norte, Natal.
15	Sampaio, E.V.S.B., Souto, A., Rodal, M.J.N., Castro, A.A.J.F. & Hazin, C.	1994	Caatingas e cerrados do NE - biodiversidade e ação antrópica. *In:* Anais da conferência nacional e seminário latino-americano da desertificação. Fundação Grupo Esquel do Brasil, Brasília.
16	Silva, R.A. da, Santos, A.M.M. & Tabarelli, M.	2003	Riqueza e diversidade de plantas lenhosas em cinco unidades de paisagem da Caatinga. *In:* Ecologia e conservação da Caatinga. (eds I.R. Leal, M. Tabarelli & J.M.C. da Silva), pp. 337-366. Editora da Universidade Federal de Pernambuco, Recife.
17	Silva, V.M., Araújo Filho, J.A., Leite, E.R., Pereira, V.L.A. & Ugiette, S.A.	1995	Manipulação da caatinga e seu efeito sobre parâmetros fitossociológicos e de produção em Serra Talhada, Pernambuco. Anais da XXXII Reunião da Sociedade Brasileira de Zootecnia. pp. 58-61. Sociedade Brasileira de Zootecnia, Brasília.
18	SUDENE	1979	Projeto para o desenvolvimento integrado da Bacia Hidrográfica do Jatobá; levantamento da vegetação. SUDENE, Recife.
19	Tavares, S.	1988	Inventário da vegetação dos tabuleiros do Nordeste. Escola Superior de Agricultura de Mossoró. Coleção Mossoroense, Mossoró.

20	Trovão, D.M. de B.M., Alves, R.R.N., Dantas Neto, J., Fernandes, P.D. & Andrade, L.A.	2010	Fragments of Caatinga in the Sub-Basin of Rio Bodocongó: A Conservation Study in the Brazilian Semi-Arid Tropics. *In*: Semi-Arid Environments: Agriculture, Water Supply and Vegetation (ed. Degenovine, K.M.). Nova Science Publishers, New York.
21	Ururahy, J.C. & Oliveira Junior, L.C.	1986	Estimativa do volume de fitomassa parcial das formações arbóreas da caatinga. *In:* Anais do Simpósio sobre a Caatinga e sua exploração racional, Feira de Santana. pp. 243-269. Embrapa, Brasília.

Anexo 5- Levantamentos florísticos ou fitossociológicos na região do semiárido brasileiro (domínio fitogeográfico da Caatinga) disponíveis na forma de teses e dissertações.

N°	Autor	Ano	Título	Universidade
1	Gomes, M.A.F.	1979	Padrões de caatinga nos Cariris Velhos, Paraíba	Universidade Federal Rural de Pernambuco
2	Lira, O.C.	1979	Continuum vegetacional nos Cariris Velhos, Paraíba	Universidade Federal Rural de Pernambuco
3	Oliveira, J.G.B.	1979	Characterization of range sites	University of Arizona
4	Lyra, A.L.R.T.	1982	Efeito do relevo na vegetação de duas áreas do município do Brejo da Madre de Deus (PE)	Universidade Federal Rural de Pernambuco
5	Souza, G.V.	1983	Estrutura da vegetação da Caatinga hipoxerófila do estado de Sergipe	Universidade Federal Rural de Pernambuco
6	Lima, G.F.C.	1984	Determinação da fitomassa aérea disponível ao uso animal em caatinga pastejada na região de Ouricuri - PE	Universidade Federal Rural de Pernambuco
7	Rodal, M.J.N.	1984	Fitoecologia de uma área do médio vale do Moxotó, Pernambuco	Universidade Federal Rural de Pernambuco
8	Ferraz, E.M.N.	1985	Florística e fitossociologia de uma área da Caatinga arbórea da fazenda Boa Vista, Custódia-PE	Universidade Federal Rural de Pernambuco
9	Silva, G.C.	1985	Flora e vegetação das depressões inundáveis da região de Ouricuri - PE	Universidade Federal Rural de Pernambuco
10	Carvalho, V.C.	1986	Structure et dynamique de la vegetation en milieu tropical semi-aride	Université de Toulouse - Le Mirail
11	Emperaire, L.	1987	Vegetation et gestion des ressources naturelles dans la Caatinga du sud-est du Piaui (Bresil)	Université Pierre et Marie Curie - Paris 6
12	Moura, J.W.S.	1987	Disponibilidade e qualidade de pastos nativos e de capim buffel (Cenchrus ciliaris L.) diferido no semi-árido de Pernambuco	Universidade Federal Rural de Pernambuco
13	Santos, M.F.A.V.	1987	Características de solo e vegetação em sete áreas de Parnamirim, Pernambuco	Universidade Federal Rural de Pernambuco
14	Ferreira, R.L.C.	1988	Análise estrutural da vegetação da Estação Florestal de Experimentação de Açu-RN, como subsídio básico para o manejo florestal	Universidade Federal de Viçosa
15	Araújo, E.L.	1990	Composição florística e estrutura da vegetação de três áreas de	Universidade Federal Rural de

			Caatinga de Pernambuco	Pernambuco
16	Vasconcelos, A.J.N.	1990	Otimização de parcelas em levantamentos botânicos em áreas de solos bruno não cálcicos do estado de Pernambuco	Universidade Federal Rural de Pernambuco
17	Fonseca, M.R.	1991	Análise da vegetação arbustivo-arbórea da caatinga hiperxerófila do noroeste do estado de Sergipe	Universidade Estadual de Campinas
18	Silva, I.H.	1991	Correlações entre a vegetação e tipos distintos de solos no baixio de Irecê, Bahia	Universidade Federal Rural de Pernambuco
19	Araújo, F.S.	1992	Composição florística e fitossociologia da vegetação de Carrasco, Novo Oriente - CE	Universidade Federal Rural de Pernambuco
20	Rodal, M.J.N.	1992	Fitossociologia da vegetação arbustivo-arbórea em quatro áreas de Caatinga em Pernambuco	Universidade Estadual de Campinas
21	Alcoforado Filho, F.G.	1993	Composição florística e fitossociologia de uma área de Caatinga arbórea no município de Caruaru, PE	Universidade Federal Rural de Pernambuco
22	Ferraz, E.M.N.	1994	Variação forístico-vegetacional na região do vale do Pajeú, Pernambuco	Universidade Federal Rural de Pernambuco
23	Oliveira, M.E.A.	1995	Vegetação e flora de uma área de transição Caatinga-Carrasco em Padre Marcos - PI	Universidade Federal de Pernambuco
24	Araújo, F.S.	1998	Estudos fitogeográficos do carrasco no nordeste do Brasil	Universidade Estadual de Campinas
25	Luna, R.G.	1998	Microbiota edáfica e fitocenose como indicadores de degradação ambiental do semi-árido paraibano	Universidade Federal da Paraíba
26	Nascimento, C.E.S.	1998	Estudo florístico e fitossociológico de um remanescente de caatinga à margem do rio São Francisco, Petrolina-Pernambuco	Universidade Federal Rural de Pernambuco
27	Gomes, A.P.S	1999	Florística e fitossociologia da vegetação arbustiva subcaducifólia no município de Buíque - Pernambuco	Universidade Federal Rural de Pernambuco
28	Lemos, J.R.	1999	Fitossociologia do componente lenhoso de um trecho de vegetação arbustiva caducifólia espinhosa no Parque Nacional Serra da Capivara, Piauí, Brasil	Universidade Federal de Pernambuco
29	Andrade, W.M.	2000	Variações de abundância em populações de plantas da Caatinga	Universidade Federal Rural de Pernambuco
30	Figueirêdo, L.S.	2000	Influência dos sítios de estabelecimentos na forma das plantas de populações simpátricas da caatinga	Universidade Federal Rural de Pernambuco
31	Pereira, I.M.	2000	Levantamento florístico do estrato arbóreo e análise da estrutura	Universidade Federal da Paraíba

			fitossociológica de ecossistemas de Caatinga sob diferentes níveis de antropismo	
32	Barbosa, F.M.	2001	O extrativismo do angico-vermelho (Anadenanthera colubrina (Vell.) Brenan) no Cariri ocidental da Paraíba: uma perspectiva para o manejo florestal sustentado da Caatinga	Universidade Federal da Paraíba
33	Camacho, R.G.V.	2001	Estudo fitofisiográfico da Caatinga do Seridó - Estação Ecológica do Seridó, RN	Universidade de São Paulo
34	Lima, C.E.L.	2002	Levantamento Florístico de um Fragmento de Mata de Agreste, em Lagoa Seca, Paraíba	Universidade Federal de Pernambuco
35	Silva, R.A.	2002	Riqueza e diversidade de espécies vegetais lenhosas da Caatinga na região de Xingó, Alagoas	Universidade Federal de Pernambuco
36	Farias, R.R.S.	2003	Florística e fitossociologia em trechos de vegetação do Complexo de Campo Maior, Campo Maior, Piauí	Universidade Federal de Pernambuco
37	Mendes, M.R.A.	2003	Florística e fitossociologia de um fragmento de Caatinga Arbórea, São José do Piauí, Piauí	Universidade Federal de Pernambuco
38	Pereira, D.D.	2003	O caroá Neoglaziovia variegata Mez no Cariri paraibano: ocorrência, antropização e possibilidades de manejo no assentamento Estrela D’alva	Universidade Federal da Paraíba
39	Rodarte, A.T.A.	2003	Flora fanerogâmica das dunas interiores da margem esquerda do médio rio São Francisco, Ibiraba, Barra, Bahia, com ênfase na flora apícola (10º47’37''S e 42º49'25''W)	Universidade Federal da Bahia
40	Carvalho, K.C.B.	2004	Florística e fitossociologia de uma área de Caatinga na RPPN Maurício Dantas, Betânia, Pernambuco	Universidade Federal Rural de Pernambuco
41	Costa, K.C.C.	2004	Fitossociologia do componente lenhoso da vegetação caducifólia espinhosa da depressão sertaneja no Nordeste do Brasil	Universidade Federal Rural de Pernambuco
42	Feitoza, M.O.M	2004	Diversidade e caracterização fitossociológica do componente herbáceo em áreas de Caatinga no Nordeste do Brasil	Universidade Federal Rural de Pernambuco
43	Silva, K.A.	2004	Caracterização florística e fitossociológica do componente herbáceo ocorrente em áreas de Caatinga do cristalino e sedimentar em Petrolândia, PE	Universidade Federal Rural de Pernambuco
44	Barros, J.S.	2005	Compartimentação geoambiental no complexo de Campo Maior, PI: uma área de tensão ecológica	Universidade Federal do Piauí

45	Chaves, E.M.F.	2005	Florística e potencialidades econômicas da vegetaçao de carrasco no município de Cocal, Piauí, Brasil	Universidade Federal do Piauí
46	Lucena, R.F.P.	2005	A hipótese da aparência ecológica poderia explicar a importância local de recursos vegetais em uma área de Caatinga?	Universidade Federal Rural de Pernambuco
47	Oliveira, R.L.C.	2005	Prioridade de conservação e sustentabilidade do extrativismo de plantas medicinais da Caatinga	Universidade Federal Rural de Pernambuco
48	Santana, J.A.S.	2005	Estrutura fitossociológica, produção de serapilheira e ciclagem de nutrientes em uma área de Caatinga no Seridó do Rio Grande do Norte	Universidade Federal da Paraíba
49	Funch, R.R.	2006	Avaliação dos limites do Parque Nacional da Chapada Diamantina, Bahia, Brasil, através de análise da vegetação	Universidade Estadual de Feira de Santana
50	Lemos, J.R.	2006	Florística, estrutura e mapeamento da vegetação da Estação Ecológica de Aiuaba, Ceará	Universidade de São Paulo
51	Lima, A.L.A.	2006	Padrões fenológicos de espécies lenhosas e cactáceas em uma área do semi-árido do nordeste do Brasil	Universidade Federal Rural de Pernambuco
52	Lima, J.R.	2006	Florística e estrutura da floresta estacional decídua montana da Reserva Natural Serra das Almas, município de Crateús, Ceará	Universidade Federal Rural de Pernambuco
53	Pitrez, S.R.	2006	Florística, fitossociologia e citogenética de angiospermas ocorrentes em inselbergues	Universidade Federal da Paraíba
54	Queiroz, R.T.	2006	Diversidade florística do componente herbáceo da Estação Ecológica do Seridó, Serra Negra do Norte - RN, Brasil	Universidade Federal do Rio Grande do Norte
55	Vasconcelos, S.F.	2006	Fenologia e síndromes de dispersão de espécies arbustivas e arbóreas ocorrentes em uma área de Carrasco no planalto da Ibiapaba, Ceará	Universidade Federal de Pernambuco
56	Araújo, L.V.C	2007	Composiçao florística, fitossociologia e influência dos solos na estrutura da vegetaçao em uma área de Caatinga no semi-árido paraibano	Universidade Federal da Paraíba
57	Aurino, A.N.B.	2007	Avaliação dos impactos da extração de lenha sobre a diversidade vegetal no município de Tenório, Seridó Oriental Paraibano: uma perspectiva biológica e social	Universidade Federal da Paraíba
58	Fabricante, J.R.	2007	Relações sinecológicas da faveleira - Cnidoscolus phyllacanthus (Mul. Arg.) Pax L. Hoffm. no semiárido nordestino	Universidade Federal da Paraíba

59	Freire, Á.M.	2007	Composição florística e fitossociológica do componente lenhoso de um trecho da mata ciliar do riacho de Bodocongó no cariri paraibano	Universidade Estadual da Paraíba
60	Freitas, A.C.	2007	Caracterização florística e fitossociológica da mata ciliar arbórea do Riacho Boa Vista, Lagarto, SE	Universidade Federal de Sergipe
61	Pessoa, L.M.	2007	Variação espacial e sazonal do banco de sementes do solo em uma área de Caatinga, Serra Talhada, PE	Universidade Federal Rural de Pernambuco
62	Silva, M.D.R.O.	2007	Hidráulica do escoamento superficial e erosão numa área de Caatinga no semi-árido do Brasil	Universidade Federal Rural de Pernambuco
63	Cavalcanti, A.D.C	2008	Variação temporal do componente lenhoso de uma área de Caatinga em Betânia/PE	Universidade Federal Rural de Pernambuco
64	Nascimento, C.E.S.	2008	Comportamento invasor da algarobeira Prosopis juliflora (Sw) DC. nas planícies aluviais da caatinga	Universidade Federal de Pernambuco
65	Araujo, G.M.	2009	Matas ciliares da Caatinga: florística, processo de germinação e sua importância na restauração de áreas degradadas	Universidade Federal Rural de Pernambuco
66	Menezes, M.O.T.	2009	Viabilidade da compartimentação pedo-climática para o planejamento da conservação biológica - estudo de caso na microbacia do riacho Capitão-Mor (Ceará)	Universidade Federal do Ceará
67	Menino, G.C.O.	2009	Florística e estrutura da regeneração natural da vegetação ciliar do Rio Pandeiros, Norte de Minas Gerais	Universidade Estadual de Montes Claros
68	Santos, C.S.	2009	Diagnóstico da flora apícola para sustentabilidade da apicultura no estado de Sergipe	Universidade Federal de Sergipe
69	Santos, P.R.G.	2009	A vegetação em afloramentos rochosos no semi-árido: diversidade e respostas ao ambiente	Universidade Federal de Pernambuco
70	Santos, R.M.D.	2009	Identidade e relações florísticas da caatinga arbórea do norte de Minas Gerais e sudeste da Bahia	Universidade Federal de Lavras
71	Silva, S.O.	2009	estudo de duas áreas de vegetação da Caatinga com diferentes históricos de uso no agreste pernambucano	Universidade Federal Rural de Pernambuco
72	Alves Junior, F.T.	2010	Estrutura, biomassa e volumetria de uma área de Caatinga, Floresta-PE	Universidade Federal Rural de Pernambuco
73	Azevedo, I.F.P	2010	Fenologia de espécies arbóreas de vegetação ciliar em região de transição Cerrado - Caatinga	Universidade Estadual de Montes Claros

74	Carvalho, E.C.D.	2010	Diversidade, estrutura e sucessão ecológica em vegetação de Caatinga no trópico semi-árido	Universidade Estadual da Paraíba
75	Menezes, B.S.	2010	Dinâmica espaço-temporal em um fragmento de savana decídua espinhosa, semi-árido do Brasil	Universidade Federal do Ceará
76	Nascimento, K.R.P.	2010	Composição florística e variações morfo-pedológicas em uma área de Caatinga em Pernambuco	Universidade Federal de Pernambuco
77	Santos, J.M.F.F.	2010	Diversidade e abundância interanual no componente herbáceo da Caatinga: paralelos entre uma área preservada e uma área antropizada em regeneração natural	Universidade Federal Rural de Pernambuco
78	Tabosa, A.B.	2010	A comunidade de macrófitas aquáticas em uma lagoa temporária do semiárido brasileiro: variações estruturais e coexistência de espécies	Universidade Federal do Ceará
79	Almeida, V.S.	2011	Uso, manejo e estrutura da vegetação da Caatinga por duas comunidades quilombolas do município de Jeremoabo, Bahia, Brasil	Universidade Estadual de Feira de Santana
80	Damascena, L.S.	2011	Caracterização da savana estépica parque no baixo médio São Francisco, Bahia, Brasil	Universidade Estadual de Feira de Santana
81	Ferraz, J.S.F.	2011	Análise da vegetação de Caatinga arbustivo-arbórea em Floresta, PE, como subsídio ao manejo florestal	Universidade Federal Rural de Pernambuco
82	Ferreira, E.V.R.	2011	Composição florística, estrutura da comunidade e síndrome de dispersão de um remanescente de Caatinga em Poço Verde - Sergipe	Universidade Federal de Sergipe
83	Machado, W.J.	2011	Composição florística e estrutura da vegetação em área de Caatinga e Brejo de Altitude na Serra da Guia, Poço Redondo, Sergipe, Brasil	Universidade Federal de Sergipe
84	Marangon, G.P.	2011	Estrutura e padrão espacial em vegetação de Caatinga	Universidade Federal Rural de Pernambuco
85	Mariano, K.R.S.	2011	Composição, estrutura e funcionamento da vegetação em um gradiente de mata ciliar no submédio São Francisco, Bahia, Brasil	Universidade Estadual de Feira de Santana
86	Marroquim, P.M.G.	2011	Florística e fitossociologia do estrato arbustivo-arbóreo de um fragmento de mata ciliar na região do baixo São Francisco	Universidade Federal de Sergipe
87	Mateus, F.A.P.S.	2011	Arbóreas forrageiras: pastagem o ano todo na Caatinga	Universidade Federal de Santa

			sergipana	Catarina
88	Nogueira Junior, F.C.	2011	Estrutura e composição de uma vegetação ripária, relações dendrocronológicas e climáticas na Serra dos Macacos em Tobias Barreto, Sergipe-Brasil	Universidade Federal de Sergipe
89	Normando, L.R.O.	2011	Fatores espaço-temporais e riqueza de macrófitas aquáticas de lagoas temporárias do semiárido do Brasil	Universidade Federal do Ceará
90	Silva, A.C.C.	2011	Monumento Natural Grota do Angico: florística, estrutura da comunidade, aspectos autoecológicos e conservação	Universidade Federal de Sergipe
91	Silva, S.S.L.	2011	Caracterização ecológica e estrutural de macrófitas em reservatórios no estado de Pernambuco	Universidade Federal Rural de Pernambuco
92	Veloso, M.D.M.	2011	Estrutura, diversidade florística e variações espaciais do componente arbóreo-arbustivo da vegetação ciliar do Rio Pandeiros, norte de Minas Gerais	Universidade Federal de Lavras

CAPÍTULO 2- A catalogue of the flora of the Caatinga Phytogeographical Domain: a synthesis of the data available on floristic and phytosociological surveys

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ABSTRACT

A catalogue is presented of plant names in use in the Caatinga Phytogeographical Domain (CPD), the largest semiarid ecorregion of South America. We compiled all pubished papers we could locate with floristic and/or phytosociological data relating to the CPD and created a database of all site-based surveys, all names reported in these surveys and the basic ecological data associated with each species. We then mapped the names used in survey reports to those currently accepted in Brazil, consulting specialists to resolve taxonomic and nomenclatural issues before synthesizing the data in order to present here a list of all names in use. Thus this compilation represents the taxonomic data in use by generalist botanists on a sub continental scale. Synthesizing the previously dispersed ecological data available for the species, we explored general ecological patterns in the CPD. We also classified each survey as documenting the flora of a specific type of environment within the CPD and compared the general floristic resemblance between different environments within CPD on a biogeographical scale. Rarefaction curves and species richness estimator indices were employed in order to address the question as to whether or not the Caatinga Phytogeographical Domain, one of the largest seasonally dry tropical areas in the world, can be described as well-sampled. To date over 1700 species were reported in site-based floristic and phytosociological studies in the CPD. Most surveys focused only on woody plants, ignoring the non woody component, but we show here that a large proportion of the plant biodiversity in the Caatinga is comprised of non woody plants. We estimate that 40% of the existing species were not sampled by site-based surveys. Moreover, most of the species in our database were recorded from a single site, while a few species were considered widespread. When comparing the number of widespread species in our dataset to results published for the cerrado savannas, we show that species in Caatinga seems to have a much more restricted distribution than plants in the Cerrado. We present here a catalogue of all plant names recorded and discuss sampling and geographical issues related to the floristic study of Caatinga.

Key-words: Brazil, Compilation, Semiarid, Seasonally Dry Tropical Forests

Introduction

Seasonally dry tropical areas are among the most threatened of the world's ecoregions (Miles *et al.* 2006). They represent dry scrublands, woodlands and forests under semiarid climate, which have relatively rich soils and are under pressure from logging, clearing for agriculture, fragmentation, desertification and overgrazing (Sampaio 1995, Miles *et al.* 2006, Pennington *et al.* 2006). South America has many different ecoregions (Olson *et al.* 2001) and among them many scattered and disjunct sites under seasonally dry tropical climates, exposed annually to a dry season over five months long (Sarmiento 1975, Pennington *et al.* 2000). Although diverse in physiognomy and geographical location, these seasonally dry tropical formations have some ecological features in common, the most notable being a long dry season and a number of shared disjunct taxa (e.g. Prado & Gibbs 1993, Oliveira *et al*. 2013). Of the seasonally dry tropical areas of South America, the largest one and subject of the present study is located in the Northeastern part of Brazil [Fig. 1] and is known as Caatinga (Prado & Gibbs 1993, Sampaio 1995, Pennington *et al.* 2000, Linares-Palomino *et al.* 2011).

The Caatinga Phytogeographical Domain (CPD) is one of the six major Brazilian Phytogeographical Domains [Fig. 1] (IBGE 2004) and is one of the largest semiarid areas in South America, comprising more than 800,000Km^2 (Ab'Sáber 1974; Ab'Sáber 2003; IBGE 2004). Located in Northeastern Brazil and surrounded by the Atlantic Rain Forest and the Cerrado domains [Fig. 1] the CPD experiences a semiarid climate due to a stable low pressure atmospheric zone (Nimer 1972). This semiarid climate is characterised by low rainfall, strong seasonality and unpredictable and erratic precipitation (Nimer 1972). To a first approximation, the extent of the CPD is defined by areas with less than 1,000mm annual rainfall (Reddy 1983, Prado 2003), and usually the annual evapotranspiration is twice the precipitation or more. This results in a severe shortage of edaphic water for plants during the dry season, which can last well over six months (Nimer 1972). Areas with increasingly higher rainfall regimes mark the transition from caatinga vegetation to the atlantic forest in the east. The ecotone between atlantic forest and caatinga is called *Agreste* and supports a mix of caatinga vegetation in some stretches and wet forests in others (Porto *et al.* 2004). At its western extremity, the CPD shows a transition to the cerrado savannas, characterized by a climate which, though seasonal, is more predictable and stable, and by the differences in soil and fire regime that govern the occurrence of savannas (Eiten 1972).

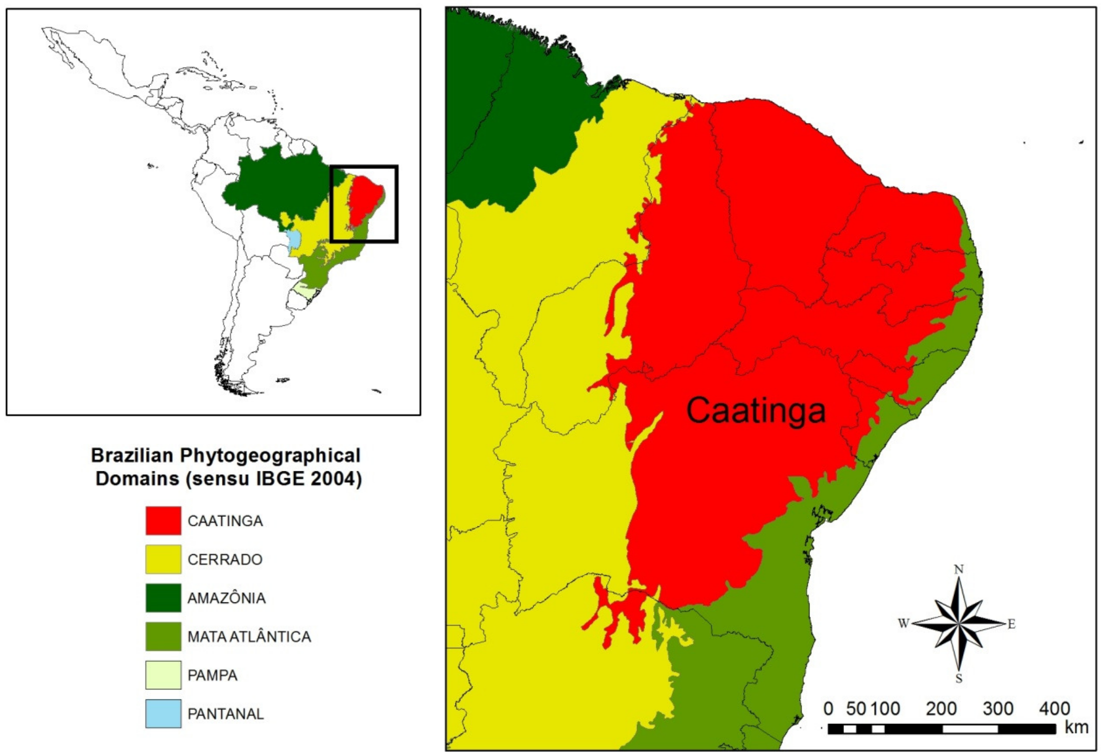

FIGURE 1. Geographical location for the Caatinga Phytogeographycal Domain (after IBGE 2004), bounded by the Atlantic rainforest to the east and the cerrado savannas to the west.

During most of the 20th century it was said that the CPD had a flora poor in species and endemism (Sampaio *et al.* 2002). This region was also deemed to lack distinctive, characteristic taxa, the flora being comprised predominantly by species and genera from the surrounding phytogeographical domains surviving under drier conditions (e.g. Rizzini 1963). In the absence of recognition of its conservation value, there has been limited support for studies and for the establishment of natural reserves in Caatinga. As a result the CPD is one of the least protected natural regions of Brazil (Castelletti *et al.* 2003). However, the assumption that the CPD was a species poor region was in great part due to the minimal scientific attention paid to the area, which remained one of the least studied during the 20th century (Santos *et al.* 2011). It is now recognized that the CPD was scientifically neglected by biologists as compared to the Atlantic rainforest or the Cerrado savannas (Tabarelli & Vicente 2002, Santos *et al.* 2011) and that the CPD is relatively rich in species (Sampaio *et al.* 2002, Giulietti *et al.* 2006, Forzza *et al.* 2010). Towards the end of the 20th century the number of publications on the flora of the CPD increased, redressing in part the previous lack of data for many regions in the domain.

Within the CPD many different kinds of vegetation occur. The main type is the caatinga *sensu stricto* vegetation, located in the widespread "Depressão Sertaneja" crystalline lowlands (Sampaio 1995, Velloso *et al.* 2002). In addition to the crystalline terrains that dominate the landscape, large sedimentary basins also play an important role in the biodiversity composition of the semiarid region of Brazil, because these areas have a very different soil type and harbor a flora that is different to that found in crystalline areas (Gomes *et al.* 2006, Queiroz 2006, Cardoso & Queiroz 2007, Santos *et al.* 2012). The Crystalline Caatinga and the Sedimentary Caatinga, are the two main and most widespread habitats in the CPD, but there are also other environment types such as inselbergs, aquatic communities and riverine forests, and these formations are usually overlooked within the CPD. Moreover, the CPD has two very large ecotones with the surrounding phytogeographical domains: the Agreste, where caatinga has a transition to the Atlantic Forest in the east, and the ecotone with the Cerrado, to the west [Fig. 1]. Over the last two decades, an increasing number of floristic and phytosociological papers have been published about plant communities of the CPD, presenting the opportunity for a synthesis of the literature produced and a search for general patterns.

Floristic and phytosociological papers represent one of the most widespread uses and compilations of plant names by generalist botanists and data from these papers can be integrated in studies with a biogeographical approach (e.g. Oliveira-Filho & Fontes 2000, Ratter *et al.* 2003). Moreover, floristic and phytosociological studies are a good source of ecological and biogeographical data not available from strictly taxonomic catalogues. Floristic studies often record information on plant habits, vegetation types and the geographical location of plant communities which can be integrated into biogeographical and macroecological studies. Once synthesized, these data can provide interesting insights about species, communities, and patterns, which could not be discerned from the individual studies. Thus, our project aimed to produce a catalogue of plants of the CPD, with a view to achieving the following objectives:

1) Document the scientific names used by botanists publishing floristic and phytosociology studies in the Caatinga Phytogeographical Domain.
2) Characterize the plant diversity sampled in Caatinga by floristic and phytosociological studies, reporting the number of species sampled to date in each family and genus and documenting the richest taxa and the most widespread species in the CPD;

3) Analyse the floristic differences between environment types within the CPD;
4) Compare the plant habit spectra in different environments within the CPD and understand the proportions of species referable to woody and non woody plant guilds;
5) Assess through rarefaction curves and species estimator indices how well sampled is the diversity in the CPD, and how many species can be expected to occur there;
6) Determine which are the most problematic genera and families for identification in floristic and phytosociological studies.

Materials and Methods

This catalogue was built upon an extensive bibliographical survey. We consulted all published volumes of the main biological and botanical Brazilian journals, as well as international bibliographical electronic databases (Web of Science, Scielo and Scholar Google) in search of floristic and phytosociological papers published about the CPD. We also checked the bibliography of most of these papers looking for cited articles not previously compiled. In a further attempt to locate any overlooked publications we consulted botanical researchers in Northeastern Brazilian universities. We considered all papers published in periodicals up to the end of 2011. We then built a bibliographical database of papers dealing with the floristics and phytosociology of plant communities in the CPD [Appendix 1]. Studies restricted to seedling diversity were excluded, as were phytosociological papers presenting only truncated tables, where rare species were omitted. The remaining studies [Appendix 1] were registered in a database using Brahms software (http://herbaria.plants.ox.ac.uk/bol/), developed by Oxford University. All species sampled in these papers were included in the database together with their habit (when available), geographic location and basic ecological information.

The plant communities within the Brazilian semiarid are not homogeneous. There are many subtypes of plant community typical of the CPD as well as some enclaves of vegetation belonging to the surrounding Cerrado domain (to the west) and to the Atlantic forest domain (to the east). Furthermore, in the middle of the CPD there is a range of highlands called the Chapada Diamantina. These highlands have a mix of caatinga vegetation, rocky grasslands, cerrado savannas and wet forests in a complex mosaic. We considered in our catalogue all plant communities within the CPF [as mapped by Velloso *et al.* 2002 - see Fig. 2] and its transitional areas, but we excluded enclaves of rocky grasslands of Chapada Diamantina (campos rupestres), cerrados and rainforests, because these three formations are related floristically to other Brazilian phytogeographical domains. All other plant communities (including aquatic communities and ecotonal areas) were included in our synthesis. We thus classified each published study in one of the following plant community types that occur within the CPD:

1) *Crystalline Caatinga*: is the most widespread formation in the CPD, dominating the landscape in the *depressão sertaneja* lowlands over crystalline bedrocks. The crystalline caatinga (or caatinga *sensu stricto*) comprises most of the landscape in the CPD;
2) *Sedimentary Caatinga*: is the main formation in the sedimentary basins of the CPD. These sedimentary basins provide very different pedological conditions to plant communities when compared to the *depressão sertaneja* areas and harbor a floristically and physiognomically different form of caatinga, which we called Sedimentary Caatinga (elsewhere termed *carrascos* and *caatingas de areia*);
3) *Transition crystalline/sedimentary*: occurs in the areas of transition between crystalline and sedimentary caatingas;
4) *Inselbergs*: in sites where soils are very shallow or absent, there are inselberg communities, usually where granitic hills are emergent above the lower and flatter surrounding landscape. Although inselbergs can be found in both crystalline and sedimentary landscapes, all surveys published to date for this environment type were within crystalline terrains;
5) *Riverine forests*: alongside rivers that cross the CPD there are gallery forests. These grow in soils that are usually deeper and with higher edaphic moisture than in areas of typical crystalline caatinga. Although riverine forests can be found in both crystalline and sedimentary landscapes, all surveys published to date for this environment type were within crystalline terrains;
6) *Agreste communities*: Sites with crystalline caatinga vegetation located in the ecotone between the CPD and the Atlantic Forest Domain. We considered here only the dry formations of the Agreste, excluding patches of rainforests (known as "brejos de altitude"), as these have a flora related to the Atlantic Forest;
7) *Caatinga of the Chapada Diamantina*: in the Chapada Diamantina Highlands there is a mix of floras from different Brazilian phytogeographical domains, including caatinga, wet forest, cerrado and rocky grasslands. We included here only studies dealing with caatinga sites in the Chapada Diamantina.
8) *Arboreal Caatinga*: a taller and less seasonal subtype of Caatinga (which according to Santos *et al.* 2012 is a distinctive plant community within Caatinga) that occurs in the south of Bahia and north of Minas Gerais states;
9) *Caatinga in Campo Maior*: this is an area of complex transition between the Cerrado and Caatinga in Piauí state. We considered here only studies in Campo Maior that sampled the Caatinga vegetation, but not studies in the cerrado;
10) *Aquatic communities*: aquatic plant communities in rivers, lakes or artificial reservoirs;
11) *Unclassified Caatinga*: Not all of our sites could be assigned unambiguously to one of the above categories. Although the larger sedimentary basins of Northeastern Brazil are well charted, there are smaller ones spread over the CPD. Also, the relatively large Apodi sedimentary basin, on the boundary between the states of

Ceará and Rio Grande do Norte was not charted by Velloso *et al.* (2002) and studies located in these places are difficult to classify with confidence as crystalline or sedimentary caatingas. We also found some studies in degraded crystalline caatinga sites, where marked modifications in plant communities occur for anthropogenic reasons (especially agriculture). If a study was located in an area where we were unsure about the geology or if the study concerned a degraded site we placed the study site in the "*Unclassified Caatinga*" category.

Objective 1: Documenting the scientific names applied in floristic and phytosociological studies of the Caatinga Phytogeographical Domain

In order to attain the first objective of this catalogue, all species reported in each paper we compiled were added to a database in Brahms software. With this we built a complete list of names reported in all papers. We then checked each name against the database of the *Lista de Espécies da Flora do Brasil* (Forzza *et al.* 2011) and treated the names as accepted or synonym following this list. When a name encountered in one of the studies was not present in the *Lista de Espécies da Flora do Brasil*, we tried to contact specialists in order to check if the name was an unusual but published synonym, a valid but misapplied name or a *nomen nudum*. All taxonomic information obtained through the *Lista de Espécies da Flora do Brasil*, including updates to Forzza *et al*. (2011) found as a result of queries, and through personal communication with specialists was entered in the Brahms database, giving each compiled name the status of accepted, synonym, misapplied or *nomen nudum*. In cases where a specialist informed us of a nomenclatural novelty or taxonomic change which has not yet appeared in the *Lista do Brasil*, we included these in taxonomic notes under the relevant accepted name. We also recorded exotic species reported in the floristic papers and a list of exotic species is presented in a separate Appendix from the native specie list, in order to not lose data on non native plants and keep the exotics clearly labeled, following the recommendations of Moro *et al.* (2012). Once all the data were registered, we generated reports using Brahms, in order to produce a catalogue of all plant names in use in the CPD, with associated ecological and geographical data.

Objective 2: Determining the richest families and genera and the more frequent species throughout the Caatinga Phytogeographic Domain

To reach our second objective, we took the complete list of names, mapped all synonyms to their accepted names and eliminated exotic plants and records not identified to species level. Based on this list of accepted names, we calculated which were the families and genera represented by most species in the dataset – which we considered the 'richest' families and genera. We also evaluated which are the most widespread species, based on the frequency of the species in the dataset. We built a presence/absence matrix for all species at all sites and drew from there the number of occurrences we had for each species, in order to determine the most common ones and the number of rare species. Some papers present data for woody and non woody plants, while others deal only with woody or only with non woody plants. We calculated the number of studies with information for woody plants (studies addressing total flora plus woody only studies) and the number of papers with information for the non-woody plants (total flora plus non-woody only studies) and produced two lists of "frequent species", being those reported in at least one quarter (25%) of the sites, for woody and non-woody species respectively.

Objective 3: Quantifying and comparing the floristic differences between environment types within the Caatinga Phytogeographical Domain

To determine the floristic similarities and differences between environment types within CPD, we built matrices of the presence/absence (incidence table) and also the number of records (frequency table) of each species in each environment type. We then compared the floristic resemblance of the environment types within the CPD using group and ordination analysis (Legendre & Legendre 1998, McCune & Grace 2002). We grouped the environment types using the Unweighted Pair Group Method with Arithmetic Mean (UPGMA) algorithm with Sorensen index, in order to determine which environments were more similar in floristic composition. We also applied the Nonmetric Multidimensional Scaling (NMS) using Sorensen (Bray-Curtis) distance and stability criterion of 0.00001 to obtain the best two dimensional solution for the same dataset (McCune & Grace 2002). NMS is considered an efficient technique to ordinate ecological samples based on the occurrence of species (McCune & Grace 2002, McCune & Mefford 2011). UPGMA and NMS were applied using both the incidence and frequency matrices in order to show the general floristic resemblance of the different environment types with respect to one another using PCOrd 6.0 software (McCune & Mefford 2011).

Objective 4: Accounting the habit spectra of communities in the CPD

To address our fourth point we selected from the compiled papers only those dealing with general flora (i.e. both woody and non woody) that reported the habit for each individual species. The most commonly reported habits were trees and treelets, climber/lianas/vines, shrubs, subshrubs and herbs, but occasionally other categories such as "succulent", "cactus" and "rupicolous" were employed, as well as hemiparasites and epiphytes. To calculate the habit spectra we considered all tree, treelets and shrubs as "Woody Plants", and all herbs and subshrubs as "Non Woody Plants". Climbers, lianas and vines were considered in the category of "Climber Woody Plants" or "Climber Non Woody Plants", depending on the level of lignification of the adult plant, based on our field experience. Plants whose habits were reported as cactus, succulent or rupicolous were reclassified as "Woody" or "Non Woody" plants, following our field experience. Hemiparasites and epiphytes were kept as a separate category. Having all species reclassified as "Woody Plants", "Climber Woody Plants", "Non Woody Plants", "Climber Non Woody Plants", "Hemiparasites" and "Epiphytes", we built a matrix with the habit spectrum for each area. We then calculated the "mean spectrum" for the whole CPD, taking the mean number of occurrences for each habit in all areas summed.

Objective 5: Is the Caatinga Phytogeographical Domain well collected and how many species are out there?

In order to have an idea whether a study site (from local to continental scales) is well collected and what might be the real richness of a site one can use both rarefaction curves and species richness estimator indices (Gotelli & Colwell 2011). These are techniques that use resampling procedures to generate smoothed collection curves, with the observed number of species for each sampling effort. Based on the number and distribution of rare species in the sample (those occurring in only one or two sampling units) one can estimate the expected "actual" number of species in an area (Gotelli & Colwell 2011). We used these procedures to show the observed number of species and the estimated richness in each environment type of the CPD and also in the CPD as a whole, using the ICE, Chao 2, Jackknife 1 and Jackknife 2 indices, which are based on incidence data (Colwell *et al.* 2004, Chao *et al.* 2005, Gotelli & Colwell 2011).

We built presence/absences matrices for each environment in the CPD and for the Caatinga Domain as a whole. We then calculated the rarefaction curves and richness estimator indices for the total dataset and for each environment type separately using EstimateS software (Colwell 2009) with 1,000 randomizations. We didn't calculate these indices for the caatingas of Campo Maior and Chapada Diamantina because these environments had only two and three published studies, respectively (not enough to calculate Chao 2 and ICE indices), nor for the Unclassified Caatinga category because this category grouped studies in degraded areas or in undetermined types of vegetation, which makes it difficult to interpret the results. Nevertheless, these sites were included in the computation of the richness of the CPD as a whole, because in the context of the CPD, these sites represent extra sampling observations. We then addressed the questions: 1) are the currently available floristic and phytosociological samples sufficient to stabilize the collector curves, or are the curves still steep, indicating that new species can be expected with more sampling effort?; and 2) what is the expected total richness for each environment type and for the CPD as a whole?

Objective 6: Determining which are the most problematic genera and families for identification in floristic and phytosociological studies.

We extracted from our database the number of times when a record was assigned to a genus, but not to a species, or when a record was assigned to a family, but not to a genus. These were considered "partial identifications". We also calculated the number of records not assigned to any family. We considered as most problematic those genera for which at least ten records in the database which had not been assigned to species. Similarly, the most problematic families were those with at least ten records not assigned to species or not assigned to a genus.

Results

1- Documenting the scientific names applied in floristic and phytosociological studies of the Caatinga Phytogeographical Domain

We found in the published literature 131 floristic and/or phytosociological lists of species for inclusion in our study [Appendix 1]. The geographic coverage of published papers is more concentrated in Pernambuco and Paraíba states, while in Bahia, the largest state of Northeastern Brazil, there are relatively few studies. Rio Grande do Norte state had a relatively high number of studies, but these were generally smaller surveys, many in degraded caatinga or in not clearly defined ecosystems types. We found no papers on the CPD in Sergipe, Alagoas and Maranhão states up to 2011. Of the 131 lists, 78 focus exclusively on woody plants, nine exclusively on non woody plants, and 44 on the general flora (woody + non woody plants) [Table 1]. Together these papers represented collections made in 10 different subtypes of plant communities within Caatinga [Fig. 2] and provided 8076 plant records representing 1928 plant names (1568 accepted names, 355 synonyms and five names with uncertain status) for 1714 native species distributed in 629 genera and 131 families [Appendix 2], plus 32 exotic species [Appendix 3]. Besides validly published names, we also found 39 *nomina nuda* and/or names used in error (including some names bearing no close resemblance to any formally published binomial, which are most likely misspellings) [Appendix 4].

TABLE 1. Number of studies that sampled the general flora (woody and non woody plants), woody only flora, and non woody only flora in each environment type within the Caatinga Phytogeographical Domain.

Environment type	General flora	Woody only	Non woody only	Total
Aquatic communities	11	0	0	11
Arboreal Caatinga	0	9	0	9
Caatinga (unclassified subtype)	1	16	4	21
Caatinga in Agreste (Ecotone to the Atlantic Forest)	2	3	1	6
Caatinga in Campo Maior (Ecotone to the Cerrado)	0	2	0	2
Caatinga in the Chapada Diamantina	0	3	0	3
Crystalline Caatinga	4	27	3	34
Inselberg	11	0	0	11
Riverine forest	1	9	0	10
Sedimentary Caatinga	11	7	0	18
Transition crystalline/sedimentary	3	2	1	6
Total	44	78	9	131

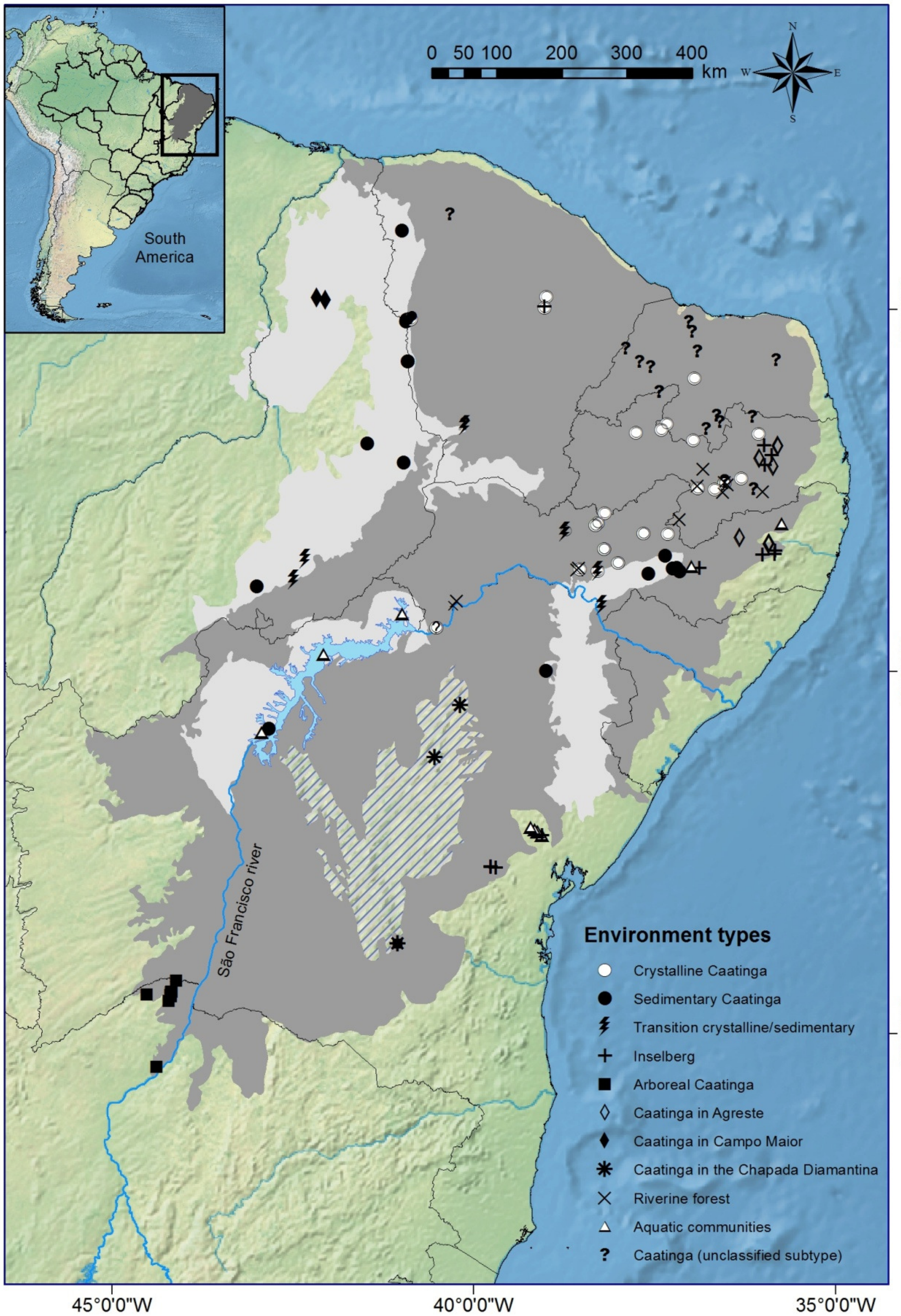

FIGURE 2. Surveys in the Caatinga Phytogeographical Domain used to build the catalogue, differentiated by environment types within the Domain. Dark gray areas are ecorregions in the Caatinga Domain (sensu Velloso *et al.* 2002) mainly in crystalline terrains. Light gray areas are ecorregions in the Caatinga Domain mainly in sedimentary terrains. The hatched area is the *Chapada Diamantina* ecorregion, where caatinga, cerrado, wet forests and rocky grasslands (campos rupestres) intermix.

2- Determining the richest families and genera and the more frequent species throughout the Caatinga Phytogeographic Domain

The richest family in the CPD was Fabaceae, with 292 accepted species, followed by Euphorbiaceae (103), Malvaceae (82) and Asteraceae (67) [Table 2, Appendix 2]. The richest genera were *Croton* Linnaeus (1753: 1004-1005) (37 species), *Ipomoea* Linnaeus (1753: 159-162) (28 species), *Mimosa* Linnaeus (1753: 516-523) (28), *Senna* Miller (1754) (21), *Chamaecrista* Moench (1794: 272) (24) and *Erythroxylum* Browne (1756: 278) (24) [Table 3, Appendix 2]. Only 40 families (30.5% of the total 131) and 24 genera (4% of the total 629) were represented in our database by 10 species or more. At the other extreme, 36 species were the sole representative of their family and 16 families were represented by just two species each. A similar pattern was seen at genus level: 120 genera had only two and 330 only one reported species.

TABLE 2. Families with at least 10 species recorded in the database of the Caatinga Phytogeographical Domain. See Appendix 2 for a complete list of all accepted genera and species in all families.

Family	Number of species	Family	Number of species	Family	Number of species
Fabaceae	292	Sapindaceae	31	Combretaceae	13
Euphorbiaceae	103	Bromeliaceae	31	Salicaceae	12
Malvaceae	82	Cactaceae	28	Rutaceae	12
Asteraceae	67	Lamiaceae	26	Commelinaceae	12
Convolvulaceae	66	Erythroxylaceae	24	Annonaceae	11
Poaceae	62	Verbenaceae	23	Rhamnaceae	10
Bignoniaceae	52	Solanaceae	23	Portulacaceae	10
Cyperaceae	52	Polygalaceae	18	Polygonaceae	10
Rubiaceae	51	Capparaceae	17	Oxalidaceae	10
Apocynaceae	43	Turneraceae	16	Nyctaginaceae	10
Myrtaceae	42	Araceae	16	Dioscoreaceae	10
Malpighiaceae	38	Acanthaceae	14	Celastraceae	10
Orchidaceae	34	Amaranthaceae	13		
Boraginaceae	32	Plantaginaceae	13		

TABLE 3. Genera with at least 10 species recorded in the database of the Caatinga Phytogeographical Domain. See Appendix 2 for a complete list of all accepted species in all genera.

Genus	Number of species	Genus	Number of species
Croton	37	Fridericia	13
Mimosa	28	Jacquemontia	13
Ipomoea	28	Polygala	12
Chamaecrista	24	Machaerium	12
Erythroxylum	24	Lippia	11
Senna	21	Turnera	11
Cyperus	20	Hyptis	11
Eugenia	19	Manihot	11
Sida	17	Casearia	10
Evolvulus	16	Oxalis	10
Solanum	14	Dioscorea	10
Cordia	14	Aspidosperma	10

The most constant species throughout the CPD in the woody component was *Aspidosperma pyrifolium* Martius (1824: vol I, 60), reported in 78 (64%) of the 122 surveys presenting data for woody plants, followed by *Commiphora leptophloeos* (Martius) J.B. Gillett (1980: 582) (72 areas), *Jatropha mollissima* (Pohl) Baillon (1864: 268) (70), then *Cereus jamacaru* Candolle (1828: vol. 3, 467) and *Myracrodruon urundeuva* Allemão e Cysneiro (1862: 3) (69 areas each) [Table 4]. A total of 21 woody species were found in 25% or more of all the surveys which included woody plants. In the non woody component, the most constant species were *Melochia tomentosa* Linnaeus (1759: 1140) and *Tacinga palmadora* (Britton & Rose) Taylor & Stuppy (2002: 112), reported in 24 (44%) of the 54 surveys presenting data for non woody plants, followed by *Tacinga inamoena* (Karl Schumann) Taylor & Stuppy (2002: 119) (20 sites) and *Neoglaziovia variegata* (Arruda) Mez in Martius (1894: 427), *Mollugo verticillata* Linnaeus (1753: 89) and *Waltheria americana* Linnaeus (1753: 673), with 16 records each [Table 5]. Just 11 species of non-woody plants were found in 25% or more of the compiled surveys. Thus for both the woody and the non-woody components just a few species are frequent throughout the CPD, while most of the species reported were rare. Of the species recorded (native and exotic), 744 were reported from a single site, 293 from two and 174 from three, thus 70% of the species were reported from three sites or fewer, and 81% of species reported from five or fewer of the 131 areas [Fig. 3].

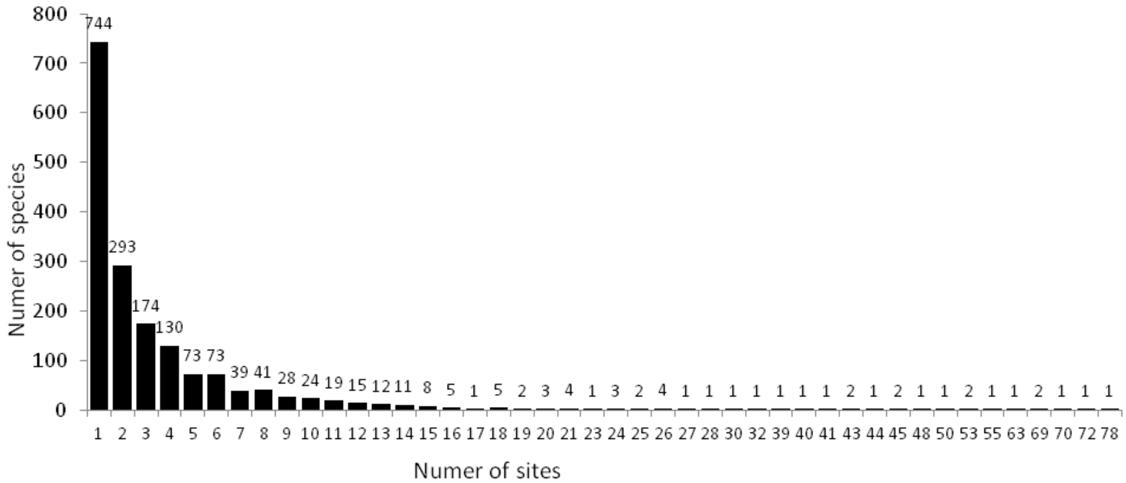

FIGURE 3. Histogram of the constancy of species throughout the Caatinga Phytogeographical Domain. Most species were recorded at only one site.

TABLE 4. Most constant woody species (occurring in at least 25% of the 122 compiled surveys with data on woody plants) throughout the Caatinga Phytogeographical Domain. For a complete list of species, consult appendix 2.

Species	Crystalline Caatinga (n= 34)	Sedimentary Caatinga (n= 18)	Transition Crystalline / Sedimentary (n= 6)	Inselberg (n= 11)	Agreste (n=6)	Arboreal Caatinga (n= 9)	Campo Maior Ecotone (n= 2)	Chapada Diamantina (n= 3)	Riverine forest (n= 10)	Unclassified (n= 21)	Aquatic Communities (n= 11)	Total number of occurrences in terrestrial ecosystems (n= 120)	Total number of occurrences in the CPD (n= 131)
Aspidosperma pyrifolium	27	4	4	3	4	8	2	0	10	16	0	78	78
Commiphora leptophloeos	27	9	2	2	4	7	0	2	5	14	0	72	72
Jatropha mollissima	30	4	3	5	4	0	0	1	8	15	0	70	70
Cereus jamacaru	21	10	0	7	5	5	2	3	8	8	0	69	69
Myracrodruon urundeuva	24	3	4	4	4	9	1	2	7	11	0	69	69
Anadenanthera colubrina	25	2	4	2	2	8	1	1	7	11	0	63	63
Bauhinia cheilantha	26	2	5	1	3	0	0	0	5	13	0	55	55
Mimosa tenuiflora	18	3	2	2	2	6	0	1	7	12	0	53	53
Poincianella pyramidalis	23	2	1	4	4	0	0	1	8	10	0	53	53
Cynophalla flexuosa	20	4	2	3	5	0	0	0	9	7	0	50	50
Spondias tuberosa	15	3	3	4	3	6	0	3	6	5	0	48	48
Piptadenia stipulacea	14	7	2	2	3	0	0	0	5	12	0	45	45
Schinopsis	12	2	3	0	4	8	0	3	8	5	0	45	45

brasiliensis													
Libidibia ferrea	12	4	3	1	3	0	2	0	9	10	0	44	44
Combretum leprosum	12	5	0	1	0	6	2	0	5	12	0	43	43
Ziziphus joazeiro	10	3	2	4	4	1	0	1	10	8	0	43	43
Pilosocereus gounellei	15	3	1	4	2	0	1	0	8	7	0	41	41
Croton sonderianus	15	4	1	0	3	0	0	0	5	12	0	40	40
Lantana camara	8	8	4	7	3	0	0	2	4	3	0	39	39
Croton heliotropiifolius	9	6	2	4	2	0	0	0	4	3	2	30	32
Amburana cearensis	12	2	2	0	1	0	2	2	3	6	0	30	30

TABLE 5. Most constant non woody species (occurring in at least 25% of the 53 compiled surveys with data on non woody plants) throughout the Caatinga Phytogeographical Domain. For a complete list of species, consult appendix 2.

Species	Crystalline Caatinga (n= 34)	Sedimentary Caatinga (n= 18)	Transition Crystalline / Sedimentary (n= 6)	Inselberg (n= 11)	Agreste (n=6)	Arboreal Caatinga (n= 9)	Campo Maior Ecotone (n= 2)	Chapada Diamantina (n= 3)	Riverine forest (n= 10)	Unclassified (n= 21)	Aquatic Communities (n= 11)	Total number of occurrences in terrestrial ecosystems (n= 120)	Total number of occurrences in the CPD (n= 131)
Melochia tomentosa	9	3	1	4	1	0	0	1	3	2	0	24	24
Tacinga palmadora	13	2	1	2	2	0	0	2	0	2	0	24	24
Tacinga inamoena	4	6	2	4	0	0	0	0	1	3	0	20	20
Mollugo verticillata	4	3	2	5	0	0	0	0	1	0	1	15	16

Neoglaziovia variegata	4	6	3	2	0	0	0	0	0	1	0	16	16
Waltheria americana	1	5	1	4	0	0	0	0	0	3	2	14	16
Alternanthera brasiliana	2	3	2	6	1	0	0	0	0	1	0	15	15
Delilia biflora	4	0	1	4	2	0	0	0	0	2	2	13	15
Sida galheirensis	2	6	3	4	0	0	0	0	0	0	0	15	15
Euphorbia hyssopifolia	6	1	1	3	0	0	0	0	0	1	2	12	14
Tillandsia recurvata	2	4	0	8	0	0	0	0	0	0	0	14	14

3- Quantifying and comparing the floristic differences between environment types within the Caatinga Phytogeographical Domain

The most widespread environment types within the CPD are the crystalline and sedimentary caatingas. We consider these environments to be the “core” caatinga flora. Added to these “core” environments, there are more restricted habits (e.g. riverine forests) or transitional areas (Agreste, Caatinga in Campo Maior and Arboreal Caatinga) that add more species to the flora of the CPD. Crystalline Caatinga, Sedimentary Caatinga, the Transition Crystalline/Sedimentary, the Agreste ecotone, inselbergs and riverine forest grouped together in both group and ordination analyzes. More peripheral sites like the Caatinga in Campo Maior and the Arboreal Caatinga formed, together with the Caatinga in the Chapada Diamantina, areas reasonably different from the core sites [Fig. 4; Fig. 5]. The most distinctive environments within the CPD were 1) the Aquatic communities, 2) the Caatinga in Campo Maior, and 3) the group formed by the caatingas of Chapada Diamantina and Arboreal Caatinga of Minas Gerais.

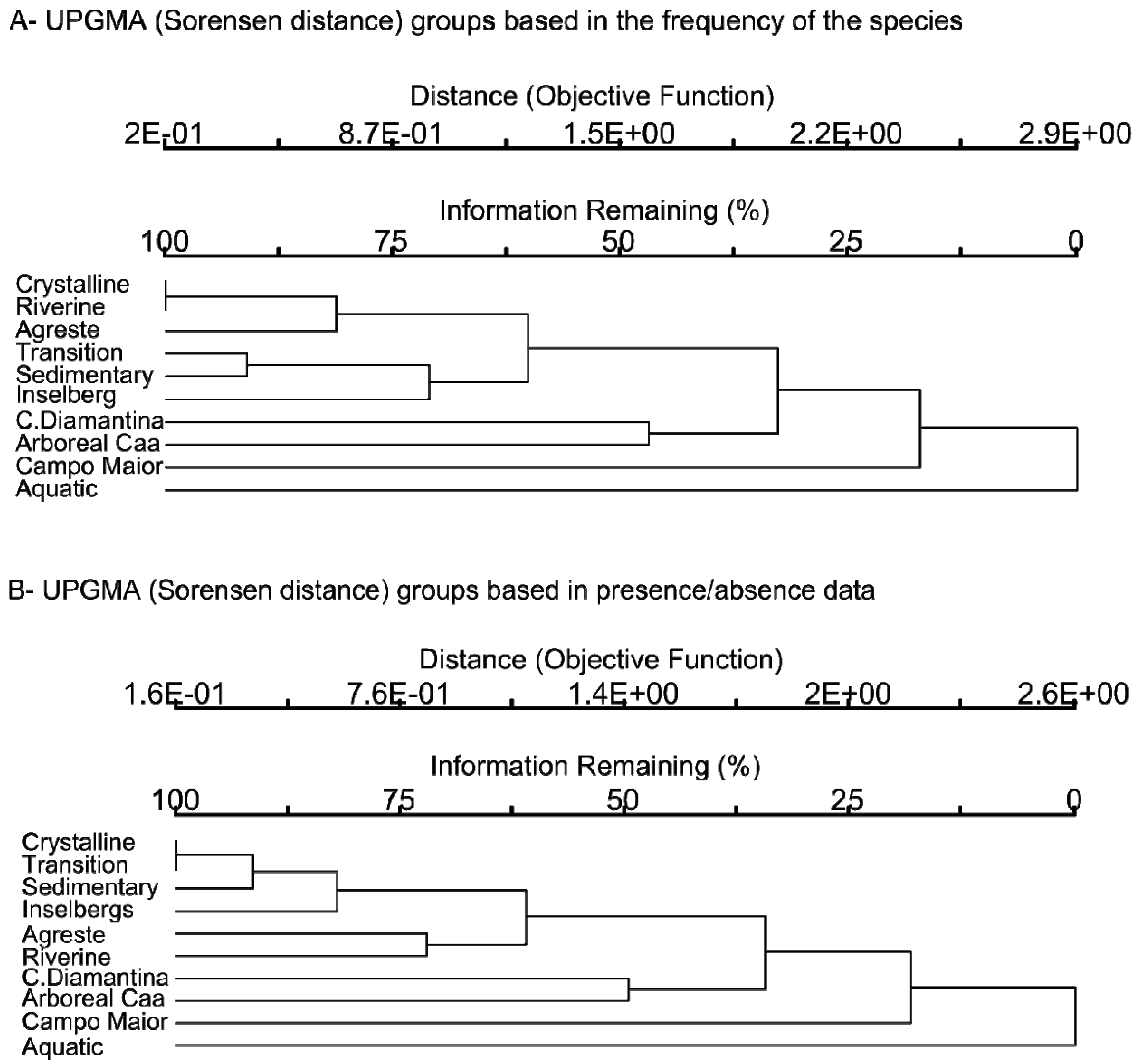

FIGURE 4. UPGMA dendrogram showing the floristic relationsips among the environment types in the Caatinga Phytogeographic Domain using (A) the frequency of the species in each environment type, and (B) incidence data. Crystalline: Crystalline caatinga; Transition: Transitional areas between crystalline and sedimentary caatingas; Sedimentary: sedimentary caatinga; Inselbergs: Inselberg rocky outcrop communities; Riverine: Riverine forests within the Caatinga Domain; Agreste: Dry forests in the Agreste ecotone between Caatinga Domain and Atlantic Forest Domains (wet forests in Agreste were not considered in the analysis); Arboreal Caa: Arboreal caatinga of northern Minas Gerais; Campo Maior: sites in Campo maior region, ecotone between Caatinga and Cerrado domains; Aquatic: Aquatic communities within the Caatinga domain.

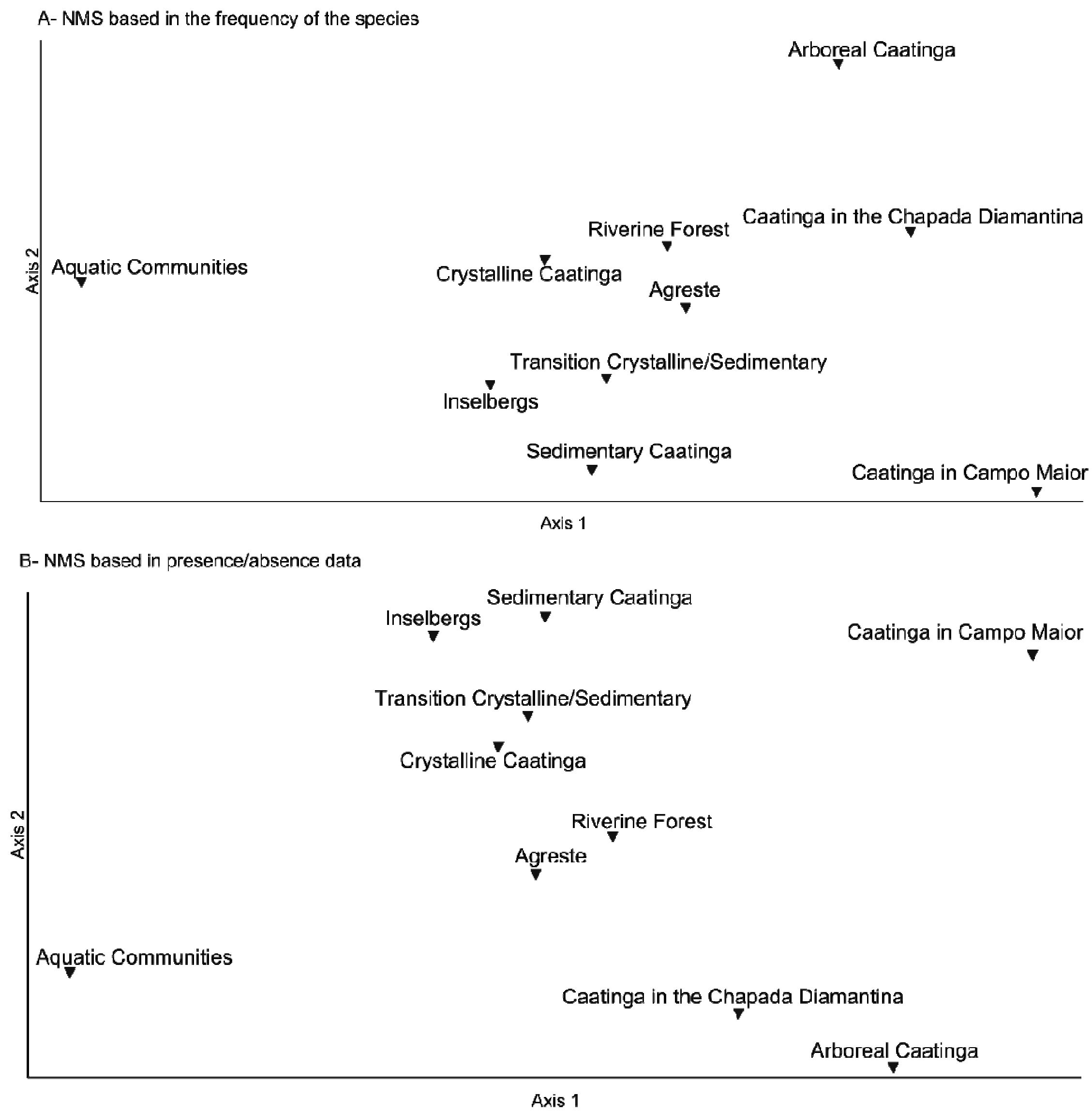

FIGURE 5. NMS ordination showing the floristic relationsips among the environment types in the Caatinga Phytogeographic Domain based in (A) the frequency of each species in each environment type, and (B) incidence data. Final stress for two dimensional solution= 4.53722.

4- Accounting the habit spectra of communities in the CPD

We found 18 papers that sampled both woody and non-woody plants (general floristic sampling) and reported, in the floristic tables, the habit of each species collected. These papers resulted in 2421 records of habits, of which 1247 records were for woody plants, 234 for woody climbers, 790 for non-woody plants, 118 for climbing non-woody plants and 32 for hemiparasites and epiphytes [Table 6]. The woody habit was predominant in sedimentary areas and in the only Agreste site included in this analysis, while the non-woody habit was predominant in crystalline areas and in the single inselberg and riverine forest sites for which we have data suitable for this analysis. When we evaluate the mean habit spectrum for all 18 sites we see that the summed sites had a predominance of woody plants (51.5% of the records plus 9.7% of woody climbers), followed by non woody species (32.6% plus 4.9% of non woody climbers).

Both epiphytes and hemiparasites comprise a small number of species in the Caatinga domain [Table 6; Fig. 6]. Epiphytes corresponded to 0.6% of the records and hemiparasites 0.7%, being always a minor component in the Caatinga Domain [Table 6; Fig. 6]. We recorded only 11 species of epiphytes in the Caatinga Domain, with only three families represented (Bromeliaceae – eight species; Orchidaceae – two species; Araceae – one species), *Tillandsia* Linnaeus (1753: 286) being the richest epiphytic genus (with six species) [Appendix 2]. Hemiparasites were similarly poorly represented, with only seven species recorded (but some records were assigned only to genus level, including records of *Phthirusa* Martius (1830: 110), *Oryctanthus* (Grisebach) Eichler in Martius (1868: 22), *Struthanthus* Martius (1830: 102-104) and *Phoradendron* Nuttall (1848: 185-186) in two families (Loranthaceae and Santalaceae). These totals take into account three species of Loranthaceae and Santalaceae, incorrectly reported by papers as epiphytes, but actually hemiparasites, and thus reclassified here [Appendix 2].

TABLE 6. Habit spectra of plant communities in the Caatinga Phytogeographic Domain.

References	Environment type	Woody (%)	Climber Woody (%)	Non woody (%)	Climber Non Woody (%)	Epiphytes (%)	Hemiparasites (%)	% Total	Number of species
Santos & Melo (2010)	Caatinga (unclassified subtype)	61.7	2.1	27.7	8.5	0.0	0.0	100	47
Tölke *et al.* (2011)	Inselberg	24.7	11.3	46.4	16.5	1.0	0.0	100	97
Souza & Rodal (2010)	Riverine forest	33.3	1.3	60.3	3.8	0.0	1.3	100	78
Alcoforado-Filho *et al.* (2003)	Caatinga in Agreste	61.5	11.5	20.8	6.3	0.0	0.0	100	96
Pinheiro *et al.* (2010)	Transition crystalline/sedimentary 3	58.7	6.7	18.7	16.0	0.0	0.0	100	150
Lemos (2004)	Transition crystalline/sedimentary 2	71.0	5.7	21.4	1.4	0.0	0.5	100	210
Lemos & Meguro (2010)	Transition crystalline/sedimentary 1	59.4	15.6	17.5	5.6	1.3	0.6	100	160
Araújo *et al.* (2011)	Sedimentary Caatinga 9	49.6	11.2	34.0	4.8	0.0	0.4	100	250
Araújo *et al.* (2011)	Sedimentary Caatinga 8	50.0	9.6	39.0	1.5	0.0	0.0	100	136
Rodal *et al.* (1999)	Sedimentary Caatinga 7	54.7	7.9	24.5	8.6	2.2	2.2	100	139
Rocha *et al.* (2004)	Sedimentary Caatinga 6	57.6	4.7	28.2	5.9	0.0	3.5	100	85
Oliveira *et al.* (1997)	Sedimentary Caatinga 5	59.3	16.0	23.5	1.2	0.0	0.0	100	81
Gomes *et al.* (2006)	Sedimentary Caatinga 4	51.0	8.9	32.8	2.6	3.1	1.6	100	192
Figueiredo *et al.* (2000)	Sedimentary Caatinga 3	53.3	15.8	23.3	2.5	1.7	3.3	100	120
Araújo *et al.*	Sedimentary Caatinga 2	63.0	13.6	21.2	2.2	0.0	0.0	100	184

(1998)									
Andrade *et al.* (2004)	Sedimentary Caatinga 1	42.4	13.3	42.4	1.3	0.6	0.0	100	158
Araújo *et al.* (2011)	Crystalline Caatinga 2	26.3	6.6	63.5	3.6	0.0	0.0	100	137
Costa *et al.* (2009)	Crystalline Caatinga 1	30.7	3.0	64.4	2.0	0.0	0.0	100	101
Total % of all records	Mean spectrum of all 18 sites	**51.5**	**9.7**	**32.6**	**4.9**	**0.6**	**0.7**	**100.0**	**-**
Total number of records		**1247**	**234**	**790**	**118**	**15**	**17**	**2421 records**	**-**

In general, both woody and non woody plants are major components in Caatinga, with a predominance of woody species in sedimentary sites and non-woody in crystalline sites. Roughly speaking woody plants comprised 60% of the records in these 18 sites against 40% of non woody plants, a ratio of 1:0.66 woody:non woody records.

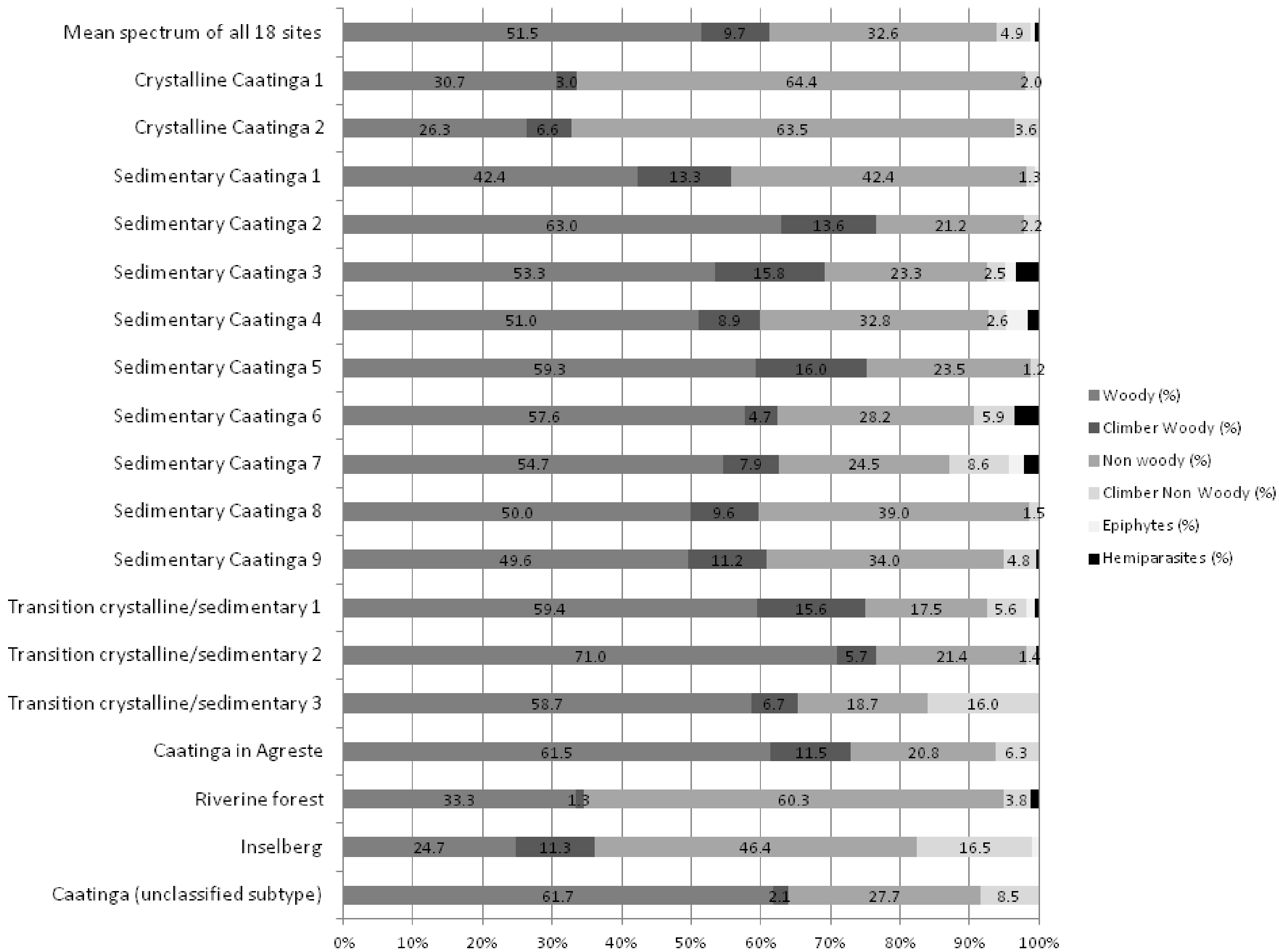

FIGURE 6. Habit spectra reported in the 18 floristic papers in the Caatinga Phytogeographical Domain where general flora (woody + non woody plants) was sampled and habit data reported for each species.

5- Is the Caatinga Phytogeographical Domain well collected and how many species are out there?

The environment type with the largest number of observed species in the CPD was the sedimentary caatinga, with 753 species reported in 1704 records, followed by the inselbergs (665 species in 1162 records), the transitional areas between crystalline and sedimentary caatingas (436 species in 635 records) and the crystalline caatinga (396 species in 1122 records) [Table 7; Fig. 7; 8]. The number of records for each species in each environment type is presented in Appendix 5. The sedimentary Caatinga had also the largest estimated richness, ranging from 1126 (Jackkinfe 1 index) to 1368 species (ICE index), followed by the inselbergs (992-1196 estimated species). The environment with the smallest estimated number of species was the arboreal caatinga, with richness estimates ranging from 161-181 species, followed by the aquatic communities (estimated richness 233 to 278 species). But it must be noted that all nine papers on arboreal caatinga sampled only woody plants [Table 1], ignoring the non-woody component [that usually comprises a considerable proportion of the biodiversity in Caatinga – Fig. 6] and thus the estimated species richness for arboreal caatinga is lower than if non-woody plants had been available for inclusion.

TABLE 7. Number of species lists available for each environment type within the Caatinga Phytogeographical Domain, with the observed number of species in each environment, the confidence interval for the observed number of species (calculated through 1,000 randomizations) and the expected number of species estimated by ICE, Chao 2, Jackknife 1 and Jackknife 2 richness estimators indices calculated with EstimateS software (Colwell 2009). We also present the gap between the largest richness estimate by indices and the actual reported number of species. The estimators were not calculated for Chapada Diamantina and Campo Maior caatingas due the small number of studies available for these environments.

Environment type	Number of sites	Observed number of species	Observed number of species (95% CI Lower Bound)	Observed number of species (95% CI Upper Bound)	Estimated richness - ICE Index	Estimated richness - Chao 2 Index	Estimated richness - Jackknife 1 Index	Estimated richness - Jackknife 2 Index	Difference between the largest estimated richness and observed richness	estimated % of the sampled biodiversity
Crystalline Caatinga	34	396	373.2	418.8	679.3	606.8	588.2	689.7	293.7	57.4
Sedimentary Caatinga	18	753	719.0	786.9	1368.0	1280.1	1126.1	1353.4	615.0	55.0
Transition Crystalline/Sedimentary	6	436	408.4	463.6	984.1	872.6	681.0	824.2	548.1	44.3
Arboreal Caatinga	9	118	97.4	138.6	173.7	164.1	160.7	181.0	55.7	67.9
Agreste	6	240	211.4	268.6	732.0	658.6	386.7	484.3	492.0	32.8
Inselberg	11	655	624.4	685.6	1196.5	1082.5	992.3	1177.3	541.5	54.7
Riverine forest	10	196	169.9	222.1	425.1	569.8	300.4	380.4	373.8	34.4
Aquatic communities	11	160	136.3	183.7	265.5	274.3	232.7	277.6	117.6	57.7
Chapada Diamantina	3	108	-	-	-	-	-	-	-	-
Campo Maior	2	85	-	-	-	-	-	-	-	-
Unclassified Caatinga subtype	21	181	-	-	-	-	-	-	-	-
Total	131	1737	1688.6	1785.4	2639.1	2681.6	2475.3	2921.7	1184.7	59.5

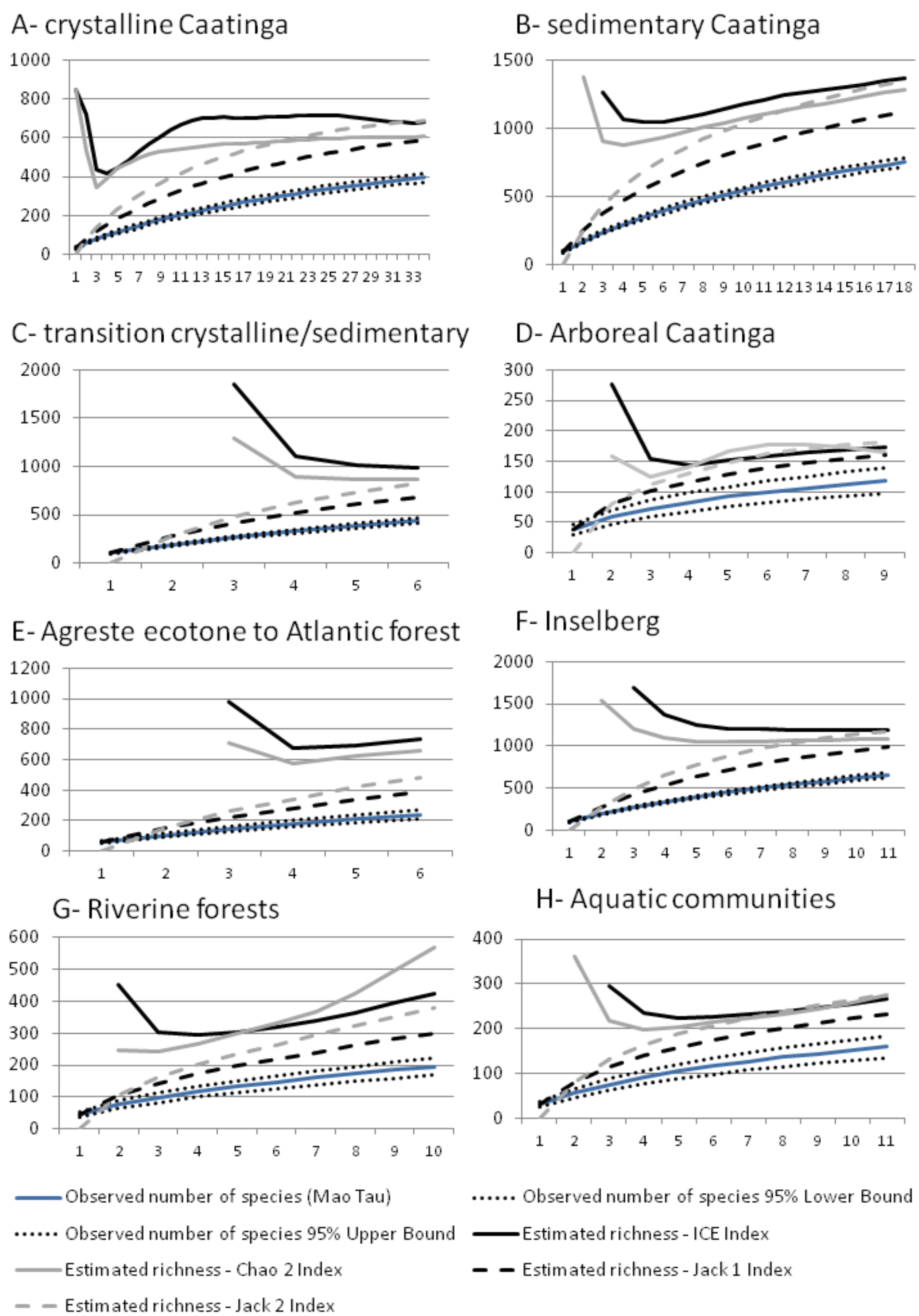

FIGURE 7.Rarefaction curves showing the number of observed species in the different environmental types within the Caatinga Phytogeographic Domain, with the 95% confidence interval for the observations (calculated with 1,000 randomizations), and the number of species estimated by ICE, Chao 2, Jackknife 1 and Jackknife 2 indices. Available data for Campo Maior and Chapada Diamantina (two and three areas, respectively), were insufficient for calculation of ICE and Chao 2 indices.

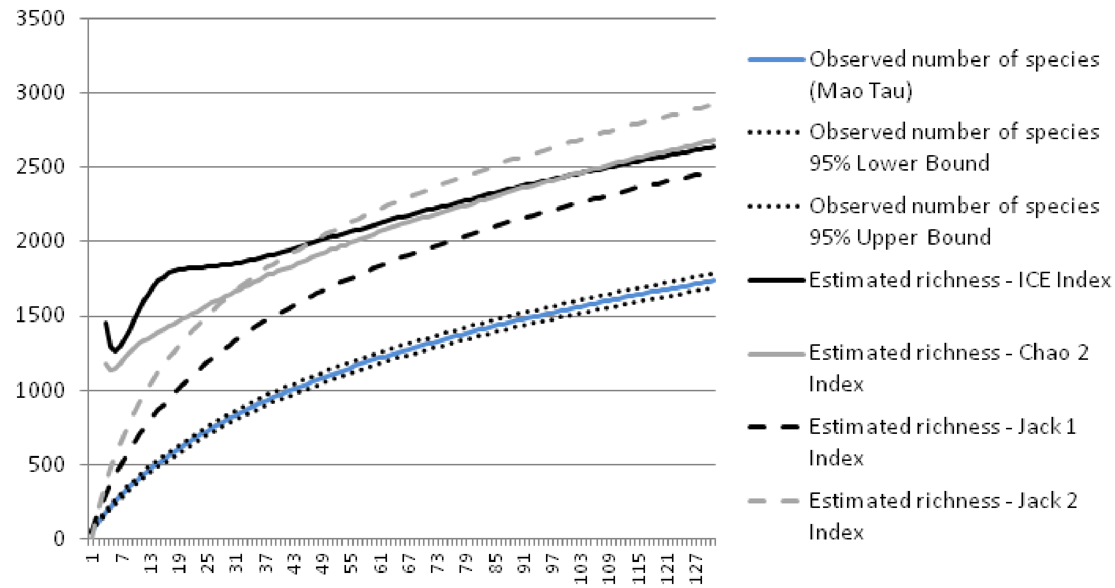

FIGURE 8. Rarefaction curve showing the total observed number of species (with the 95% confidence interval obtained with 1,000 randomizations) for the Caatinga Phytogeographical Domain as a whole (summing all 131 surveys) and the expected total number of species in CPD estimated by ICE, Chao 2, Jackknife 1 and Jackknife 2 indices.

In general it can be seen from both rarefaction curves and richness estimator indices that the number of recorded species in all environments is still growing as new studies are added [Fig. 7; 8]. The gap between the estimated richness and the sampled richness ranged from 33 to 68% of the estimated total number of species [Table 7]. When we computed the observed and estimated number of species in the whole CPD we see that there was an estimated 1185 uncollected species. This suggests that at least 40% of the species of the CPD have not yet been included in site-based floristic or phytosociological studies [Table 7].

6- Determining which are the most problematic genera and families for identification in floristic and phytosociologica studies

Of the 8076 records collated from the 131 surveys in our database, 1138 (14.1%) were records not assigned to species level. These included 1082 partial identifications (i.e. those identified only to genus or to family level) and a further 56 records not assigned even to a family. The most problematic genera for generalist botanists to identify in floristic and phytosociological studies were *Croton* Linnaeus (1753: 1004-1005) (49 records not assigned to species level), *Eugenia* Linnaeus (1753: 470-471) and *Mimosa* Linnaeus (1753: 516-523) (30 records each), and *Solanum* Linnaeus (1753: 184–188) (20 records) [Table 8;

Appendix 6] and the families presenting most problems were Fabaceae (134 records not assigned to species level), Euphorbiaceae (118), Myrtaceae (70) and Bignoniaceae and Malvaceae (52 records each) [Table 9; Appendix 7].

TABLE 8.Genera with at least 10 records not determined to species level in our database of the Caatinga Phytogeographical Domain. For the complete list of genera with partial identifications see Appendix 6.

Genus	Number of unidentified records	Genus	Number of unidentified records
Croton	49	*Sida*	14
Eugenia	30	*Erythroxylum*	12
Mimosa	30	*Sapium*	12
Solanum	20	*Cyperus*	11
Ipomoea	17	*Arrabidaea*	10
Cordia	15	*Banisteriopsis*	10
Manihot	14		
Total number of records not identified to species level		1138	

TABLE 9.Families with at least 10 partial identifications (records assigned only to genus or only to family level) in our database of the Caatinga Phytogeographical Domain. For the complete list of families with numbers partial identifications see Appendix 7.

Family	Number of unidentified records	Family	Number of unidentified records
Fabaceae	134	Amaranthaceae	16
Euphorbiaceae	118	Nyctaginaceae	16
Myrtaceae	70	Lamiaceae	15
Bignoniaceae	52	Cucurbitaceae	13
Malvaceae	52	Erythroxylaceae	13
Rubiaceae	38	Lythraceae	13
Convolvulaceae	36	Turneraceae	13
Malpighiaceae	34	Commelinaceae	12
Asteraceae	30	Sapindaceae	12
Poaceae	28	Acanthaceae	11
Solanaceae	27	Cactaceae	11
Cyperaceae	22	Portulacaceae	11
Boraginaceae	21	Celastraceae	10
Apocynaceae	20	Records not assigned to any family	56

Verbenaceae	18	
Total number of records not identified to species level		1138

Discussion

1 and 2- Documenting the scientific names applied in floristic and phytosociological studies of the Caatinga Phytogeographical Domain and determining the richest families and genera and the more frequent species throughout the Caatinga Phytogeographic Domain

Most of the names reported in our dataset (1568) are accepted names for species recognized in the Lista do Brasil (Forzza *et al.* 2010; 2011). It is important to note that whether the taxonomic identification of individual collections was accurate or not is a question beyond the scope of this study. However, the literature also included 355 synonyms i.e. names not currently considered the correct name for an accepted species. Resolution of such synonymy is an important first step in comparing lists from different sites. Without such a reconciliation step, the diversity of the Caatinga as a whole would be over-estimated in our study and the degree of floristic resemblance between sites would, in general, be underestimated. Globally, about 60% of plant names at species level are considered to be synonyms (Paton *et al.* 2008). A comparable figure for all the species names in papers included in our study is just 18%. So, viewed in the global context the proportion of synonyms encountered in our study may appear relatively low. We attribute this to the relative recency of the literature being surveyed, the vast majority being published after 2000. The number of synonyms in use might be expected to decrease further in the very latest floristic papers because of the electronic taxonomic databases which are now widely available. While access by non-specialists to taxonomic information was until very recently rather restricted and primarily via print format (which is quickly outdated), a complete checklist of plant species from Brazil is now available on the internet and is continuously updated (Forzza *et al.* 2011; Thomas *et al.* 2012). We hope that having access to this up to date, specialist maintained, freely accessible data source, generalist botanists will improve the quality of their data, reported through floristic and phytosociological work. The use of misapplied names can also be expected to decline, as now botanists can check the Brazilian official list of species to see if the name they intend to use is or not consistent with the taxonomic data available.

One of the worst problems for those gathering data from floristic papers is presented by very oddly misspelled names (orthographic variants) or names which have never been validated (principally *nomina nuda* for which descriptions have not been published), because these names lack taxonomic information unambiguously associated with them.

Fortunately electronic databases as IPNI (http://www.ipni.org/) and The Plant List (http://www.theplantlist.org/) are powerful tools to allow one to check the names. Name strings at species level which cannot be matched in these large, international databases are very likely to be *nomina nuda* or misspelled names. The coverage of these resources is less complete at infraspecific level. The digital era now enables the evaluation even of very large species lists quickly and automatically using on line tools as the Taxonomic Name Resolution Service (http://tnrs.iplantcollaborative.org/) or Plant Miner (Carvalho *et al.* 2010), which checks a whole list of names at once.

During the updating of our species lists, we relied mainly on the on line database of the "*Lista de Espécies da Flora do Brasil*" (http://floradobrasil.jbrj.gov.br), complemented by the "The Plant List" and IPNI databases to check our dataset. Names reported as accepted in The Plant List, but not recorded in the Flora of Brazil database were the most obvious candidates to be misapplied names and we consulted specialists to get more information on them (and a few proved to be genuine omissions from the Flora of Brazil). We present here the complete list of names gathered, in order to provide a comprehensive catalogue, including also the *nomina nuda* and misapplied names, what was enormously facilitated by the recent availability of on-line taxonomic databases.

We consider the catalogue presented here to be one of the most comprehensive available listing of the plant species of the Caatinga Phytogeographical Domain. However, the coverage of the catalogue is, of necessity, limited by the distribution and quality of the surveys from which the catalogue records are synthesized. Thus the catalogue can be expected to provide a fuller and more informative picture of the caatinga flora of Pernambuco and Paraíba states than, for example of the relatively poorly sampled caatinga of Bahia or indeed the states of Sergipe, Alagoas and Maranhão for which no lists suitable for inclusion in our study have been found up to 2011. Furthermore, since more than half of the studies to date focused exclusively on woody plants [Table 1], the non-woody component is clearly under-represented in our list. Moreover, while some environment types, such as sedimentary caatinga and inselbergs, were represented mostly by studies sampling general flora (both woody and non woody plants), crystalline caatinga, arboreal caatinga and riverine forests had sampling strongly skewed towards woody plants, with most studies ignoring the non woody component. Arboreal caatinga, for example, was among the least rich in our analysis [Table 7; Fig. 7], and this seems to be related to the fact that non woody plants were omitted from the sampling of these environments, reducing the number of species reported in each paper, which, in turn, were used to estimate the total number of species. These inherent biases are unavoidable in any study of this kind and should be taken into account in any analysis of the content of the catalogue as a whole.

Another bias in the data is that some plant groups were clearly underreported. Only one species of non vascular plant (*Ricciocarpos natans* (Linnaeus) Corda in Opiz (1829: 651), with two occurrences) was reported, while the number of bryophyte species reported to Caatinga by Forzza *et al.* (2010) was 93 species. Although there are some studies focused on non vascular plants in the CPD (e.g. Pôrto *et al*. 1994; Pôrto & Bezerra 1996), it is clear that generalist botanists collecting in the CPD are paying little attention to these plants. As non vascular plants are small, and not easily identified by general botanists, they often ignore them when collecting. Nevertheless we found a better picture related to Ferns. While Xavier *et al.* (2012) lists 36 species for the Caatinga, 14 species were reported by the compiled studies.

The same situation occurs with invasive species. Moro *et al.* (2012) called attention to the fact that in Brazil there is great variation in approaches dealing with exotic plants in botanical studies. Some researchers exclude from their species lists all non native species, resulting in a situation where invasive plants are underreported. While Fabricante and Siqueira Filho (2012), for example, recorded over 60 exotic species in one more localized region of the CPD, we found, in the whole dataset only 32 exotic species reported. It would be of great utility for botanists to collect and report invasive species, allowing ecologists to map the distribution of these plants. We recommend that invasive plants in the study site of floristic surveys should be reported and clearly tagged as exotic plants in the species lists as suggested elsewhere (Moro *et al.* 2012).

In summary, a range of taxonomic, geographic and life-form biases can be detected in the dataset as a whole. However, for the analyses designed to address aims 3-6, described above and discussed below, every care has been taken to select subsets of the data in which any such biases are eliminate or at least minimized. Acknowledging the known biases in the Catalogue as a whole, it is nonetheless of interest, to a naturalist at least, to compare the salient features of this caatinga synthesis with those of other syntheses. The families represented by most species in our catalogue coincide closely with the top ten families listed by Forzza *et al.* (2010) for the Caatinga phytogeographic domain sensu lato. Fabaceae tops the list in each case and no fewer than eight families are common to the top ten of both lists. Family differences between the lists can be explained primarily by (i) the bias of the present list in favour of woody species and (ii) the broader definition of Caatinga employed by Forzza *et al.* (2010). Thus, Orchidaceae and Melastomataceae, the ninth and tenth most speciose families for Caatinga in the Lista do Brasil, are certainly under-represented in our list not only because data for non-woody species are available from fewer than half of our sites, but also because Forzza's broader definition of the Caatinga would include the *campos rupestres* which are particularly rich in Melastomes and Orchids. The two families which feature among the top ten most diverse in our list, but not in Forzza's list for Caatinga are Convolvulaceae and Bignoniaceae, again attributable to the woody bias in our list. Similarly, the herbaceous families Poaceae and Cyperaceae occupy lower ranks on our list (6^{th} and 9^{th} respectively) than they do on the Lista do Brasil Caatinga table (2^{nd} and 7^{th} respectively).

In terms of the most species-rich genera, the *Lista do Brasil* for Caatinga shows that the genera represented by most species in our list [Table 3] are typically reported as having almost twice as many species for the Caatinga as a whole by Forzza *et al.* (2010). Comparison of these lists might suggest that genera such as *Chamaecrista* Moench (1794: 272) and *Turnera* Linnaeus (1753: 271) are particularly under-represented in our database but, again, this is attributable to the inclusion of the *campos rupestres* in the circumscription of caatinga used in the Lista do Brasil. The genera for which species numbers for our list most closely match species numbers reported for Caatinga *s.l.* in Forzza *et al.* (2010) are woody taxa such as *Machaerium* Persoon (1807: 276), *Hyptis* Jacquin (1786: 101) and *Erythroxylum* Browne (1756: 278).

Concerning species distributions, our analysis suggests that plants in Caatinga have distributions which are more restricted than those of the Cerrado savannas, with relatively few species which can be considered widespread. Among the woody plants of our dataset only six out of 849 species were reported at 50% or more of the sites [Table 4]. In contrast, in their larger Cerrado metanalysis Ratter *et al.* (2003) found that 38 out of 951 woody species occurred in at least 50% of the sites surveyed. Pennington *et al.* (2009) argued that the woody species of the dry forests of South America are dispersal limited, and that this influences the ecological and evolutionary patterns of this whole ecosystem. Our findings, showing a lower proportion of widespread woody species in caatinga than in cerrado, agree with Pennington's argument. Furthermore, although far less complete, and subject to the biases discussed above, the data for non woody species show a similar pattern. None of the recorded non woody species was reported from 50% or more of sites [Table 5], suggesting that herbaceous species in the caatinga are even more dispersal-limited.

3- Quantifying and comparing the floristic differences between environment types within the Caatinga Phytogeographical Domain

The CPD is the largest area of seasonal dry formations in South America and is exposed to a range of environmental factors, as different soil types, geologies, and gradients in temperature and rainfall. But among all these factors, two major types of environment are highlighted: crystalline and sedimentary terrains. Several authors have demonstrated that crystalline and sedimentary sites have distinct floras (Gomes *et al.* 2006, Queiroz 2006, Cardoso & Queiroz 2007, Araújo *et al.* 2011). We extended this analysis to the whole set of CPD environments for which floristic information was available and show that the picture is more complex. Taken as a whole, the data available to date support the differences between crystalline and sedimentary formations, but on a sub continental scale, these two environments seem to form, jointly with the inselbergs, the "floristic core" of Caatinga.

Aquatic communities were the most distinctive community within the CPD, as would be expected, since the aquatic environment is a completely different type of habitat, requiring specific adaptations and thus home to a specific flora which is adapted to it. It is worth noting that studies in Aquatic communities in Caatinga are very recent. The first paper on the topic which we could locate (França *et al.* 2003) was published less than ten years ago and only now, with more studies on aquatic plants available (Lima *et al.* 2011, Moura Júnior *et al.* 2011), an initial synthesis became possible.

Considering, the ordination and the group analysis we see that close to the core flora of Caatinga are both the Agreste ecotone to the atlantic forest and the riverine forests. Each of these had a relatively high number of species in common with the core Caatinga, but while the seasonality and water shortage is very harsh in the core Caatinga ecosystems, in Agreste region the climate is milder and the rainfall is usually more abundant (Porto *et al.* 2004). In general, the closer to the ocean or the greater the altitude the greater the rainfall, and this allows the presence of species of the Atlantic Domain in these ecotonal areas (Porto *et al.* 2004, Rodal *et al.* 2008).

Because of the less marked seasonality, one could expect to encounter some floristic elements from Mata Atlantica in the Agreste environment (Porto *et al.* 2004; Rodal *et al.* 2008), but the close resemblance between Agreste and Riverine forest is notable here. Apparently these latter two environments have many species in common with the core CPD, but also share species not present in the core environments. In their classic paper on gallery forests in the Cerrado, Oliveira-Filho & Ratter (1995) showed that these riverine forests acted as an ecological corridor for moisture adapted Atlantic and Amazonian species to cross the seasonal cerrado savanna areas. Our results suggest that something similar could be happening in the CPD, with the transitional Agreste having some distinctive species not found in the Core Caatinga (probably coming from the Atlantic Forest) and the Riverine forest acting as an ecological corridor for these species. While plants adapted to wet environments could have problems to survive in the core Caatinga environments, the more humid riverine forests could offer a pathway for some of these plants to cross the semiarid region. We cannot test this hypothesis here but it could explain the pattern we observed in our data.

The inselberg surveys we compiled range from those in the Agreste region, in the transition to the Atlantic forest, to those located within the Crystalline Caatinga. While inselbergs in drier areas include species very typical of the crystalline caatinga, those in more humid sites show species adapted to more humid condictions, as *Begonia* Linnaeus (1753: 1056), Orchidaceae and other taxa (see also Chapters 3 and 4).

More distinctive floristic conjuncts were observed in the caatingas of Chapada Diamantina, Campo Maior and Arboreal Caatinga of northern Minas Gerais [Fig. 4; Fig. 5]. These were the most distinctive terrestrial ecosystems in our data and are known to be in three ecotonal areas. The Campo Maior is the area where the CPD has a complex transition to the Cerrado Domain and represents the northewestern most transitional site of the CPD (Velloso *et al.* 2002, Farias & Castro 2004). The Arboreal Caatinga of Minas Gerais represented the southwestern most transition to the Cerrado and also had a distinct flora within the CPD [Fig. 4; Fig. 5]. This result supports those of Santos *et al.* (2012) who tested the influence of environment in structuring plant communities in the CPD and concluded that the Arboreal Caatinga is a particular subtype within the domain.

The Caatinga of the Chapada Diamantina formed a group together with the Arboreal Caatinga [Fig. 4] and was positioned between Arboreal Caatinga and the Caatinga in Campo Maior in the NMS ordination, a result consistent with the geographic position of the Chapada Diamantina highlands between these two ecotones. But the biogeographical picture may be much more complex, because the Chapada Diamantina is a region where caatinga, cerrado, wet forests and rocky grasslands meet in complex transitions (Juncá *et al.* 2005). How the transitions occur within the Chapada Diamantina and how the many subtypes of communities relate floristically to each other are points for future studies, but our data suggest that the caatinga in the Chapada Diamantina is floristically very different from the core CPD areas and approaches the floras of the Arboreal Caatingas, a result which may be more readily explained when more floristic studies (preferably not confined to woody plants) become available. The matrix with the frequency of all species on each environment type is available on appendix 5.

4- Accounting the habit spectra of communities in the CPD

A clear characteristic of the Caatinga Domain is that non-woody plants represent a considerable proportion of the plant diversity [Table 6; Fig. 6]. The contribution of non-woody plants (including non-woody climbers and self sustaining non woody plants) ranged from lowest values of 23% in a sedimentary caatinga and a transitional area to over 60% of species in the crystalline caatinga sites. When we compare these data with spectra in studies of life-forms (Costa *et al.* 2007, Araújo *et al.* 2011), it is clear that although non-woody plants constitute a considerable proportion of the species in both crystalline and sedimentary communities, crystalline caatinga sites generally have much larger proportions of non-woody plants, while in sedimentary sites woody plants tend to be the most prominent component (Araújo *et al.* 2011) [Table 6; Fig. 6]. Thus in crystalline areas, which comprise the most extensive environment type in the Caatinga Domain (Velloso *et al.* 2002), and where the majority of studies focused only on woody plants (27 of 34 studies – 79%), half or more of the local plant diversity has been ignored by most studies.

Moreover, only a small number of floristic surveys in crystalline caatinga report the habit of individual species, reducing the availability of habit data for the communities within the CPD. We recommend that further floristic studies should sample both woody and non-woody plants and report the habits (and when possible life-forms) of all species observed, in order to achieve a better characterization of their studied plant communities. Even when one is doing phytosociological work focused primarily on the woody component it is possible to devote some effort to random floristic collections, a suggestion already made in our manual of phytosociological methods for Brazil (Moro & Martins 2011).

Both epiphytes and hemiparasites were secondary elements in communities within the Caatinga Domain. But while hemiparasites are not especially diverse in other Brazilian phytogeographical domains (Moro, personal observation), epiphytes are a very species rich component of the neighbouring Atlantic Forest Domain, but not in Caatinga. The dearth of epiphytes is no doubt because Caatinga is a semiarid, highly seasonal domain, a harsh environment for tender epiphytes, more used to surviving in humid forests with closed canopy.

The dearth of habit data for the Crystalline Caatinga in the literature almost certainly reduced the proportion of non-woody plants in the mean spectrum we calculated, but these proportions are likely to change if more crystalline sites (likely to be more rich in herbs) are added. Nevertheless, our result is of value as a conservative, first approximation of the important role that non-woody plants play in the biodiversity of the CPD and is the first attempt of which we are aware to calculate a mean habit spectrum for the Caatinga. Based on our data we expect that in general non-woody plants will be a more prominent component in Crystalline Caatinga than in Sedimentary Caatinga and show that despite the many studies focused only on woody plants, a considerable proportion of the known plant diversity of the CPD is represented in the non-woody stratum.

5- Is the Caatinga Phytogeographical Domain well collected and how many species are out there?

The Catalogue of Plants and Fungi of Brazil (Forzza *et al.* 2010) reported 4,320 species of Angiosperms, 93 Bryophytes and 25 ferns and two Gymnosperms in the Caatinga *sensu latissimo*, including species reported from enclaves of other biomes (e.g. wet forest) occurring within the Caatinga. We have compiled for the CPD (excluding cerrado, Atlantic forest and campos rupestres enclaves inside Caatinga) over 1,700 species and estimated the number of species in the CPD to be 2,921 species. Forzza's and ours can be seen as estimates at either extreme of the true number of species present in the CPD. Forzza's number seems high because it uses a very broad definition of Caatinga, including in their account also enclaves of cerrado, Atlantic forest and campos rupestres (renowned for their species richness and endemism) within the Caatinga Domain. Thus Forzza *et al.*

(2010) give a good general list of species for this region of Brazil, but this probably exceeds the actual number of species in the CPD. Our data, on the other hand, support a very conservative figure. The steep slope of most collection curves and richness estimators, for example, suggests that we can expect the observed number of species to grow when the sampling effort is increased.

The CPD is recognized to have a high environmental heterogeneity, both climatic and pedologic, that is thought to be reflected in its biodiversity (Araújo *et al.* 2005). From the map showing locations of published floristic and phytosociological lists [Fig. 2], it is clear that large areas of caatinga remain unsampled by floristic and phytosociological studies, and are thus as yet unavailable for inclusion in metanalyses. The 131 papers used to build this catalogue collectively contain records of more than 1700 native species, but this number is likely to increase, as all richness estimator indices show that the expected number of species is much higher than the observed number. We estimate that at least 40% of the plant diversity of the CPD has not been reported by site-based floristic and phytosociological surveys. In general, richness estimator indices tend to underestimate the actual richness. Because of this our figures can be seen as a conservative estimate of the true richness (Brose *et al.* 2003, Chao *et al.* 2006, Gotelli & Colwell 2011). Moreover, when we look at our rarefaction and richness estimation graphs [Fig. 7; 8] it is clear that the richness estimated by most indices is growing as the sampling effort increases. Thus it can be argued that our estimates are doubly conservative and thus a good lower bound to the CPD diversity.

The sedimentary caatinga was sampled by only 18 surveys, but these papers are generally based on relatively large collection efforts, some involving sampling an area for more than one year. On the other hand, we had 34 surveys in crystalline caatinga, but some of them were very short term surveys, many of them ignoring the herbs and collecting only woody plants. In fact, 22 of the crystalline caatinga surveys reported fewer than 30 species, probably influencing the low estimated number of species for crystalline caatinga as a whole. In total we collated 1122 plant records (for 396 species) from these 34 crystalline caatinga papers as compared to 1704 records (for 753 plant species) from the 18 surveys dealing with sedimentary areas. Thus although crystalline caatinga appears less rich than sedimentary caatinga, the relatively low numbers of observed and estimated species [see table 7] for crystalline sites are at least partly attributable to the lower sampling effort invested there as compared to sedimentary sites which in general had a larger sampling effort, with more time devoted to collect species. Moreover, 79% of the studies in crystalline areas sampled only woody plants [Table 1], while the majority of its biodiversity seems to be in the non woody component [Table 6; Fig. 6].

Site-based floristic work is an important precursor to biogeographic work, modelling studies, and to mapping the potential distribution of species (e.g. Oliveira-Filho & Fontes 2000, Ratter *et al.* 2003, Queiroz, 2006; Oliveira *et al*. 2013). Such studies are therefore not only desirable in their own right but as a foundation for futher study and they often have the added advantage of augmenting the coverage of herbaria collections. Here we estimate the scale of the plant diversity of Caatinga and suggest (taking into consideration the negative bias of indices) that almost half of plant diversity in Caatinga is still not documenteded by site-based floristic and phytosociological studies. It is clear where we should direct the sampling effort in future studies: there are vast areas in Bahia state (especially in the south), and also in central Ceará, western Pernambuco and eastern Piauí for which no site-based floristic or phytosociological studies have been published. These are obvious places where botanists should focus in order to improve coverage of Caatinga [Fig. 2].

6- Determining which are the most problematic genera and families for identification in floristic and phytosociological studies

The partial identifications, to genus or just to family, under which many records were published can provide valuable insights into the specific challenges facing botanists documenting the flora of the Caatinga. In general the genera providing most problems for generalist botanists to identify are also the richest genera. *Croton* Linnaeus (1753: 1004-1005), *Eugenia* Linnaeus (1753: 470-471), *Mimosa* Linnaeus (1753: 516-523), *Ipomoea* Linnaeus (1753: 159-162), *Cyperus* Linnaeus (1753: 44–47), *Erythroxylum* Browne (1756: 278) and *Solanum* Linnaeus (1753: 184–188), for example, are all represented in our study by at least 10 different species and by at least 10 further records which could not be identified to species level [Table 3; Table 8]. Some of these genera, such as *Eugenia* and *Erythroxylum* are also recognized as problematic for botanists engaged in studies in the Atlantic Forest (Caiafa & Martins 2007), but other problematic genera common in Atlantic Forest (e.g. *Ocotea* Aublet (1775: 780-781), *Myrcia* Candolle (1827: 406), *Miconia* Ruiz & Pavón (1794: 60) - Caiafa and Martins 2007) are not often found in the Caatinga, so pose relatively few problems for botanists there [Appendix 6]. On the other hand, species-rich genera of more open formations such as *Croton*, *Mimosa* and *Ipomoea* posed greater difficulties for generalist botanists in the CPD [Table 8; Appendix 6]. Similarly, at family level, the families presenting most problems for identifcation were usually represented in the list of richest families [Table 2; Table 9; Appendix 7], with Fabaceae, Euphorbiaceae, Myrtaceae, Bignoniaceae and Malvaceae having the ones with the largest number of unidentified records.

That comparison of the lists of most speciose families/genera [Table 2; Table 3] with those of the most problematic families/genera [Table 8; Table 9] should show a high degree of congruence is scarcely surprising, since the taxa with most species will be more frequently collected by botanists (e.g. *Croton* and *Mimosa* are in 1st and 3rd place respectively in each list). The anomalies between the lists are arguably even more informative with respect to which taxa are most challenging to identify. For example, *Senna* and *Chamaecrista* legume genera are very rich in species, but are identified to species level in most of the collections, perhaps reflecting the very substantial taxonomic work on Leguminosae of Northeastern Brazil in recent decades (e.g. Queiroz 2009). In contrast, *Eugenia* is 8th in terms of species diversity but second in terms of partial identifications, *Solanum* is 12th in terms of species diversity but 4th for partial identifications and *Cordia* Linnaeus (1753: 190–191), joint 18th in terms of species diversity takes 6th place for partial identifications. These latter genera present identification problems out of proportion to their documented diversity in the Caatinga, suggesting (i) a need for more taxonomic work on these groups in the CPD and (ii) the possibility that these many partial identifications mask as yet undocumented species diversity for these groups in the CPD (see Oliveira *et al*. 2013 for an example of a Caatinga species that remained decades unidentified in herbaria and floristic papers).

We consider that a joint effect of lack of accessible taxonomic data sources is a major problem for generalist botanists in Northeastern Brazil. While a specialist generally feels comfortable in determining material from his/her group of speciality and in using very specific taxonomic keys, generalists tend to rely much more on comparisons with material deposited in herbaria and with photographs in plant guides to match their material to a species. But in Northeastern Brazil there are relatively few large herbaria, and identifications on specimens in those smaller herbaria tend to be much less reliable than those in larger, much visited (and corrected/updated) herbaria. Nevertheless the access to taxonomic data for future studies is increasing rapidly. Now the Flora of Brazil website (Forzza *et al.* 2011, Thomas *et al.* 2012) offers together with an extensive list of accepted names (and the most common synonyms) high resolution images of many herbarium sheets confirmed by specialists. Moreover, free, high quality electronic keys are already available to family level in the neotropics (Milliken *et al.* 2010), allowing botanists to assign a collection to the correct family and then check in the Flora of Brazil website the accepted names in that family. When eventually a complete Flora of Brazil is available, with electronic keys for all genera/species, associated with images, descriptions and ecological data, the rate of identification to species level is expected to improve. Nevertheless, having a key to family level (e.g. the Neotropikey - http://www.kew.org/science/tropamerica/neotropikey.htm) accompanied by an updated checklist of names and reliable identified images in the Flora of Brazil (http://floradobrasil.jbrj.gov.br) is a reality only very recently achieved by Brazilian botanists. We expect these new resources to have a strong influence in the quality of floristic and phytosociological data produced in the future.

Conclusions

Contrary to what had been assumed during the majority of the 20th century, the Caatinga Phytogeographical Domain is a rich semiarid region. Its flora is being gradually better studied and the number of floristic and phytosociological studies published annually is increasing. Nevertheless there are large areas of Caatinga uncollected and some environment types within the CPD (e.g. the Caatinga in Chapada Diamantina and Campo Maior) have remarkably little data. Floristic and phytosociological works can be integrated in synthesis studies and provide useful ecological and biogeographical insights about the biodiversity of Caatinga. We see that although a large amount of information is already available, there are many gaps in the geographical coverage of the published information and we estimate that over 40% of the species existing in the domain were not sampled in site-based floristic studies. This is also in part result of the bias towards woody plants, as most of the papers published up to date deal only with trees and shrubs, ignoring the non-woody component. We have shown that for most sites in the CPD non woody plants comprise a considerable amount of the plant biodiversity (more than half of it in some sites). Thus, new studies should ideally focus on areas with little data available [Fig. 2] and should undertake sampling of both woody and non woody plants. We present here a synthesis of both the nomenclatural information available to the Caatinga Domain and the ecological information associated with this nomenclatural data. We hope this work can be a reference about the general patterns existing in the CPD and especially we hope to have offered a general picture about the existing knowledge on plant biodiversity within Caatinga, what can allow botanists to note where there is special need for more data, as a guide to where to focus future studies.

Acknowledgments

This work was only made possible through the kind support and cooperation of many people and institutions. The authors want to thank the Fundação de Amparo à Pesquisa do Estado de São Paulo (Fapesp processes 2009/14266-7 and 2011/22498-5) and the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes) for the PhD. grants awarded to the first author. We are specially grateful to Fapesp for the international grant provided to to first author that allowed an one year interchange at the Royal Botanic Gardens, Kew. We are grateful to libraries' staff that helped us to locate all the botanical literature necessary for this work, but specially the librarians of the State University of Campinas and Royal Botanic Gardens, Kew. A large number of researchers helped us to find rare papers and we are also grateful to them, with special reference to Professor Maria Jesus Nogueira Rodal. Most of the taxonomic positions adopted here follow the "Lista de Espécies da Flora do Brasil" database (http://floradobrasil.jbrj.gov.br/), but some two hundred names presented here (mostly synonyms or misapplied names) were not available in the Lista do Brasil and we had to consult taxonomists in order to determine the status of each name. We are grateful to the taxonomists who shared their knowledge in order to make this catalogue possible: Alessandro Rapini (Apocynaceae), Alexa Araujo de Oliveira Paes Coelho (Portulacaceae), Ana Luiza Andrade Côrtes (Acanthaceae), Ana Maria Azevedo Tozzi (Fabaceae), Anderson Ferreira P. Machado (Cannabaceae), André M. Amorim (Malpighiaceae), Cyl Farney Catarino-De-Sá (Nyctaginaceae), Daniela Santos

Carneiro-Torres (Euphorbiaceae), Daniela Zappi (Rubiaceae), Eduardo Gomes Gonçalves (Araceae), Efigênia de Melo (Polygonaceae), Elnatan Bezerra de Souza (Rubiaceae), Fátima Regina G. Salimena (Verbenaceae), Gerleni Lopes Esteves (Malvaceae), Gordon C. Tucker (Cyperaceae), Gustavo Hiroaki Shimizu (Vochysiaceae), Gwilym P. Lewis (Fabaceae), Jair Eustáquio Quintino de Faria Júnior (Myrtaceae), Jefferson Prado (Pteridophytes), João B. Baitello (Lauraceae), João Marcelo Alvarenga Braga (Menispermaceae), José Floriano Pastore (Polygalaceae), José Rubens Pirani (Anacardiaceae), Julie Dutilh (Liliaceae), Julio A. Lombardi (Vitaceae), Leonardo Biral (Celastraceae), Lúcia G. Lohmann (Bignoniaceae), Luciana dos Santos Dias de Oliveira (Euphorbiaceae), Luciano Paganucci de Queiroz (Fabaceae), Ludovic Jean Charles Kollmann (Begoniaceae), Luisa Senna (Amaranthaceae), M. Fátima Araújo (Euphorbiaceae), Marcelo Monge Egea (Asteraceae), Marccus Alves (Cyperaceae), Márcio Lacerda Lopes Martins (Euphorbiaceae), Marco O. Pellegrini (Commelinaceae, Araceae), Marcos Sobral (Myrtaceae), Margareth Ferreira de Sales (Euphorbiaceae), Maria Carolina Abreu (Oxalidaceae), Maria de Fátima Agra (Solanaceae), Maria Iracema Bezerra Loiola (Erythroxylaceae), Maria Mercedes Arbo (Turneraceae), Maria Salete Marchioretto (Amaranthaceae), Maria Stapf (Boraginaceae), Marlon Machado (Cactaceae), Massimo Bovini (Malvaceae), Nicholas Hind (Asteraceae), Pedro Fiaschi (Araliaceae), Raquel Fernandes Monteiro (Bromeliaceae), Raymond Harley (Lamiaceae), Regina Célia de Oliveira (Poaceae), Renato Goldenberg (Melastomataceae), Ricardo S. Couto (Dioscoreaceae), Rodrigo A. Camargo (Fabaceae), Rodrigo Sampaio Rodrigues (Poaceae), Ronaldo Marquete (Salicaceae), Rosangela Simão Bianchini (Convolvulaceae), Sérgio Romaniuc Neto (Cannabaceae), Shirley Graham (Lythraceae), Silvana Vieira (Marantaceae), Tânia R.S. Silva (Verbenaceae), Terry Pennington (Meliaceae, Sapotaceae), Victor Martins Gonçalez (Malvaceae), Vinicius Castro Souza (Plantaginaceae), Xavier Cornejo (Capparaceae). We would like to thank also Christine Barker from IPNI, who helped to determine the correct spelling of some species and to determine whether some names were *nomina nuda* or misspelled names. We did our best to update the names to reflect the best taxonomic information available to us, but given the broad scope of the catalogue some changes may have been overlooked. Any mistakes that remain are authors'.

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Appendix 1- Floristic and phytosociological lists used to build the catalogue of plants from Caatinga and their references**.**

Nº	State	Environment category	Authors	Year	Journal	Vol.	Pages
1	BA	Aquatic communities	França, F.; Melo, E.; Góes Neto, A.; Araújo, D.; Bezerra, M.G.; Ramos, H.M.; Castro, I.; Gomes, D.	2003	Acta Botanica Brasilica	17(4)	549-559
2	BA	Aquatic communities	França, F.; Melo, E.; Góes Neto, A.; Araújo, D.; Bezerra, M.G.; Ramos, H.M.; Castro, I.; Gomes, D.	2003	Acta Botanica Brasilica	17(4)	549-559
3	BA	Aquatic communities	França, F.; Melo, E.; Góes Neto, A.; Araújo, D.; Bezerra, M.G.; Ramos, H.M.; Castro, I.; Gomes, D.	2003	Acta Botanica Brasilica	17(4)	549-559
4	BA	Aquatic communities	França, F.; Melo, E.; Góes Neto, A.; Araújo, D.; Bezerra, M.G.; Ramos, H.M.; Castro, I.; Gomes, D.	2003	Acta Botanica Brasilica	17(4)	549-559
5	BA	Aquatic communities	França, F.; Melo, E.; Góes Neto, A.; Araújo, D.; Bezerra, M.G.; Ramos, H.M.; Castro, I.; Gomes, D.	2003	Acta Botanica Brasilica	17(4)	549-559
6	BA	Aquatic communities	França, F.; Melo, E.; Góes Neto, A.; Araújo, D.; Bezerra, M.G.; Ramos, H.M.; Castro, I.; Gomes, D.	2003	Acta Botanica Brasilica	17(4)	549-559
7	BA	Aquatic communities	Moura Júnior, E.G.; Abreu, M.C.; Severi, W.; Lira, G.A.S.T.	2011	Rodriguésia	62(4)	731-742
8	BA	Aquatic communities	Moura Júnior, E.G.; Abreu, M.C.; Severi, W.; Lira, G.A.S.T.	2011	Rodriguésia	62(4)	731-742
9	BA	Aquatic communities	Moura Júnior, E.G.; Abreu, M.C.; Severi, W.; Lira, G.A.S.T.	2011	Rodriguésia	62(4)	731-742
10	PE	Aquatic communities	Lima, L.F.; Silva, S.S.L.; Moura-Júnior, E.G.; Zickel, C.S.	2011	Rodriguésia	62(4)	771-783
11	PE	Aquatic communities	Lima, L.F.; Silva, S.S.L.; Moura-Júnior, E.G.; Zickel, C.S.	2011	Rodriguésia	62(4)	771-783
12	MG	Arboreal Caatinga	Ratter, J.A.; Askew, G.P.; Montgomery, R.F.; Gifford, D.R.	1978	Revista Brasileira de Botânica	1	47-58
13	MG	Arboreal Caatinga	Santos, R.M.; Barbosa, A.C.M.C.; Almeida, H.S.; Vieira, F.A.; Santos, P.F.; Carvalho, D.A.; Oliveira-Filho, A.T.	2011	Cerne	17(2)	247-258
14	MG	Arboreal Caatinga	Santos, R.M.; Vieira, F.A.; Fagundes, M.; Nunes, Y.R.F.; Gusmão, E.	2007	Revista Árvore	31(1)	135-144
15	MG	Arboreal Caatinga	Santos, R.M.; Vieira, F.A.; Fagundes, M.; Nunes, Y.R.F.; Gusmão, E.	2007	Revista Árvore	31(1)	135-144

16	MG	Arboreal Caatinga	Santos, R.M.; Vieira, F.A.; Fagundes, M.; Nunes, Y.R.F.; Gusmão, E.	2007	Revista Árvore	31(1)	135-144
17	MG	Arboreal Caatinga	Santos, R.M.; Vieira, F.A.; Fagundes, M.; Nunes, Y.R.F.; Gusmão, E.	2007	Revista Árvore	31(1)	135-144
18	MG	Arboreal Caatinga	Santos, R.M.; Vieira, F.A.; Fagundes, M.; Nunes, Y.R.F.; Gusmão, E.	2007	Revista Árvore	31(1)	135-144
19	MG	Arboreal Caatinga	Santos, R.M.; Vieira, F.A.; Fagundes, M.; Nunes, Y.R.F.; Gusmão, E.	2007	Revista Árvore	31(1)	135-144
20	MG	Arboreal Caatinga	Santos, R.M.; Vieira, F.A.; Santos, P.F.; Morais, V.M.; Medeiros, M.A.	2008	Revista Caatinga	21(4)	154-162
21	CE	Caatinga (unclassified subtype)	Campanha, M.M.; Araújo, F.S.; Menezes, M.O.T.; Silva, V.M.A.; Medeiros, H.R.	2011	Revista Caatinga	24(3)	94-101
22	CE	Caatinga (unclassified subtype)	Souza, J.T.; Mendes, P.G.A.; Sousa, J.R.; Silva, M.A.M.; Lima, A.S.; Souza, M.M.A.	2007	Cadernos de Cultura e Ciência	2(2)	1-10
23	PB	Caatinga (unclassified subtype)	Andrade, L.A.; Fabricante, J.R.; Oliveira, F.X.	2010	Acta Scientiarum. Biological Sciences	32(3)	249-255
24	PB	Caatinga (unclassified subtype)	Paes-Silva, A.P.; Chaves, I.B.; Sampaio, E.V.S.B.	2003	Agropecuária Técnica	24(1)	47-59
25	PB	Caatinga (unclassified subtype)	Queiroz, J.A.; Trovão, D.M.B.M.; Oliveira, A.B.; Oliveira, E.C.S.	2006	Revista de Biologia e Ciências da Terra	6(1)	251-259
26	PB	Caatinga (unclassified subtype)	Santos, A.C.J.; Melo, J.I.M.	2010	Revista Caatinga	23(2)	32-40
27	PE	Caatinga (unclassified subtype)	Albuquerque, S.G.; Soares, J.G.G.; Guimarães Filho, C. Oliveira, M.C. (includes Albuquerque et al 1999)	2004	Sitientibus Série Ciências Biológicas	4(1/2)	52-58
28	RN	Caatinga (unclassified subtype)	Andrade, L.A.; Fabricante, J.R.; Oliveira, F.X.	2009	Acta Botanica Brasilica	23(4)	935-943
29	RN	Caatinga (unclassified subtype)	Andrade, L.A.; Fabricante, J.R.; Oliveira, F.X.	2009	Acta Botanica Brasilica	23(4)	935-943
30	RN	Caatinga (unclassified subtype)	Benevides, D.S.; Maracajá, P.B.;Sizenando Filho, F.A.; Guerra, A.M.N.M.; Pereira, T.F.C.	2007	Revista Verde	2(1)	33-44
31	RN	Caatinga (unclassified subtype)	Cavalcanti, A.D.C.; Rodal, M.J.N.	2010	Revista Caatinga	23(2)	41-50
32	RN	Caatinga (unclassified subtype)	Cezar, A.F.; Sizenando Filho, F.A.; Mesquita, L.X.; Costa, Y.C.S.	2006	Revista Verde	1(2)	100-112
33	RN	Caatinga (unclassified subtype)	Costa, T.C.C.; Oliveira, M.A.J.; Accioly, L.J.O.; Silva, F.H.B.B.	2009	Revista Brasileira de Engenharia Agrícola e Ambiental	13	961-974

34	RN	Caatinga (unclassified subtype)	Freitas, R.A.C.; Sizenando Filho, F.A.; Maracajá, P.B.; Diniz Filho, E.T.; Lira, J.F.B.	2007	Revista Verde	2(1)	135-147
35	RN	Caatinga (unclassified subtype)	Lira, R.B.; Maracajá, P.B.; Miranda, M.A.S.; Sousa, D.D.; Melo, S.B.; Amorim, L.B.	2007	Agropecuária Científica no Semi-Árido	3	23-30
36	RN	Caatinga (unclassified subtype)	Maracajá, P.B.; Batista, C.H.F.; Sousa, A.H.; Vasconcelos, W.E.	2003	Revista de Biologia e Ciências da Terra	3(2)	?
37	RN	Caatinga (unclassified subtype)	Miranda, M.A.S.; Maracajá, P.B.; Sousa, D.D.; Lira, R.B.; Melo, S.B. Amorim, L.B.	2007	Agropecuária Científica no Semi-Árido	3	31-43
38	RN	Caatinga (unclassified subtype)	Moreira, A.R.P.; Maracaja, P.B.; Guerra, A.M.N.M.; Sizenando Filho, F.A.; Pereira, T.F.C.	2007	Revista Verde	2(1)	113-126
39	RN	Caatinga (unclassified subtype)	Pessoa, M.F.; Guerra, A.M.N.M.; Maracajá, P.B.; Lira, J.F.B.; Diniz Filho, E.T.	2008	Revista Caatinga	21(3)	40-48
40	RN	Caatinga (unclassified subtype)	Silva, J.S.; Linhares, P.C.F.; Sizenando Filho, F.A.; Mesquita, L.X.; Maracajá, P.B.	2008	Revista Verde	3(4)	47-57
41	RN	Caatinga (unclassified subtype)	Sizenando Filho, F.A.; Maracajá, P.B.; Diniz Filho, E.T.; Freitas, R.A.C.	2007	Revista de Biologia e Ciências da Terra	7(2)	?
42	PB	Caatinga in Agreste (Ecotone to the Atlantic Forest)	Andrade, L.A.; Oliveira, F.X.; Neves, C.M.L.; Felix, L.P.	2007	Revista Brasileira de Ciências Agrárias	2(2)	135-142
43	PB	Caatinga in Agreste (Ecotone to the Atlantic Forest)	Lourenço, C.E.L.; Barbosa, M.R.V.	2003	Revista Nordestina de Biologia	17(1/2)	23-58
44	PB	Caatinga in Agreste (Ecotone to the Atlantic Forest)	Pereira, I.M.; Andrade, L.A.; Sampaio, E.V.S.B.; Barbosa,M.R.V. (includes Pereira et al 2001; 2002)	2003	Biotropica	35(2)	154-165
45	PE	Caatinga in Agreste (Ecotone to the Atlantic Forest)	Alcoforado-Filho, F.G.; Sampaio, E.V.S.B.; Rodal, M.J.N.	2003	Acta Botanica Brasilica	17(2)	287-303
46	PE	Caatinga in Agreste (Ecotone to the Atlantic Forest)	Andrade, W.M.; Lima, E.A.; Rodal, M.J.N.; Encarnação, C.R.F.; Pimentel, R.M.M.	2009	Revista de Geografia	26(2)	161-184
47	PE	Caatinga in Agreste (Ecotone to the Atlantic Forest)	Reis, A.M.S.; Araújo, E.L.; Ferraz, E.M.N.; Moura, A.N. (includes Araújo et al 2005)	2006	Revista Brasileira de Botânica	29(3)	497-508
48	PI	Caatinga in Campo Maior (Ecotone to the Cerrado)	Barros, J.S.; Castro, A.A.J.F.	2006	Interações	8(13)	119-130
49	PI	Caatinga in Campo Maior (Ecotone to the Cerrado)	Farias; R.R.S.; Castro, A.A.J.F.	2004	Acta Botanica Brasilica	18(4)	949-963
50	BA	Caatinga in the Chapada Diamantina	Lima, P.C.F.; Lima, J.L.S.	1998	Acta Botanica Brasilica	12(3)	441-450
51	BA	Caatinga in the Chapada Diamantina	Ramalho, C.I.; Andrade, A.P.; Félix, L.P.; Lacerda, A.V.; Maracajá, P.B.	2009	Revista Caatinga	22(3)	182-190

52	BA	Caatinga in the Chapada Diamantina	Ramalho, C.I.; Andrade, A.P.; Félix, L.P.; Lacerda, A.V.; Maracajá, P.B.	2009	Revista Caatinga	22(3)	182-190
53	CE	Crystalline Caatinga	Araújo, F.S.; Costa, R.C.; Lima, J.R.; Vasconcelos, S.F.; Girão, L.C.; Sobrinho, M.S.; Bruno, M.M.A.; Souza, S.S.G. *et al.*	2011	Rodriguésia	62(2)	341-366
54	CE	Crystalline Caatinga	Costa, R.C.; Araújo, F.S.; Lima-Verde, L.W.	2007	Journal of Arid Environments	68	237-247
55	CE	Crystalline Caatinga	Santos, L.C.; Veloso, M.D.M.; Sizenando Filho, F.A.; Linhares, P.C.F.	2008	Revista Verde	3(2)	116-135
56	PB	Crystalline Caatinga	Almeida Neto, J.X.; Andrade, A.P.; Lacerda, A.V.; Félix, L.P.; Bruno, R.L.A.	2009	Revista Caatinga	22(4)	187-194
57	PB	Crystalline Caatinga	Andrade, L.A.; Pereira, I.M.; Leite, U.T.; Barbosa, M.R.V.	2005	Cerne	11(3)	253-262
58	PB	Crystalline Caatinga	Andrade, M.V.M.; Andrade, A.P.; Silva, D.S.; Bruno, R.L.A.; Guedes, D.S.	2009	Revista Caatinga	22(1)	229-237
59	PB	Crystalline Caatinga	Araujo, K.D.; Parente, H.N.; Éder-Silva, E.; Ramalho, C.I.; Dantas, R.T.; Andrade, A.P.; Silva, D.S.	2010	Revista Caatinga	23(1)	63-70
60	PB	Crystalline Caatinga	Barbosa, M.R.V.; Lima, I.B.; Lima, J.R.; Cunha, J.P.; Agra, M.F.; Thomas, W.W.	2007	Oecologia Brasiliensis	11(3)	313-322
61	PB	Crystalline Caatinga	Barbosa, M.R.V.; Lima, I.B.; Lima, J.R.; Cunha, J.P.; Agra, M.F.; Thomas, W.W.	2007	Oecologia Brasiliensis	11(3)	313-322
62	PB	Crystalline Caatinga	Dantas, J.G.; Holanda, A.C.; Souto, L.S.; Japiassu, A.; Holanda, E.M.	2010	Revista Verde	5(1)	134-142
63	PB	Crystalline Caatinga	Fabricante, J.R.; Andrade, L.A.	2007	Oecologia Brasiliensis	11(3)	341-349
64	PB	Crystalline Caatinga	Gomes, M.A.F.	1980	Vegetalia	14	1-27
65	PB	Crystalline Caatinga	Luna, R.G.; Coutinho, H.D.M.	2007	Revista Caatinga	20(2)	8-15
66	PB	Crystalline Caatinga	Santos, A.M.M.; Santos, B.A.	2008	Acta Botanica Brasilica	22(4)	1077-1084
67	PE	Crystalline Caatinga	Araújo, E.L.; Sampaio, E.V.S.B.; Rodal, M.J.N.	1995	Revista Brasileira de Biologia	55(4)	595-607
68	PE	Crystalline Caatinga	Araújo, E.L.; Sampaio, E.V.S.B.; Rodal, M.J.N.	1995	Revista Brasileira de Biologia	55(4)	595-607
69	PE	Crystalline Caatinga	Calixto Jr., J.T.; Drumond, M.A.	2011	Revista Caatinga	24(2)	67-74
70	PE	Crystalline Caatinga	Cantalice, J.R.B.; Silva, M.D.R.O.; Rodrigues, J.J.V.; Rodal, M.J.N.; Pessoa, L.M.	2008	Revista Caatinga	21(4)	201-211
71	PE	Crystalline Caatinga	Costa, K.C.; Lima, A.L.A.; Fernandes, C.H.M.; Silva, M.C.N.A.; Lins e Silva, A.C.B.; Rodal, M.J.N.	2009	Revista Brasileira de Ciências Agrárias	4(1)	48-54
72	PE	Crystalline Caatinga	Drumond, M.A.; Kiill, L.H.P.; Nascimento, C.E.S.	2002	Brasil Florestal	74	37-43

73	PE	Crystalline Caatinga	Ferraz, E.M.N.; Rodal, M.J.N.; Sampaio, E.V.S.B.	2003	Phytocoenologia	33(1)	71-92
74	PE	Crystalline Caatinga	Ferraz, E.M.N.; Rodal, M.J.N.; Sampaio, E.V.S.B.	2003	Phytocoenologia	33(1)	71-92
75	PE	Crystalline Caatinga	Ferraz, E.M.N.; Rodal, M.J.N.; Sampaio, E.V.S.B.; Pereira, R.C.A.	1998	Revista Brasileira de Botânica	21(1)	7-15
76	PE	Crystalline Caatinga	Ferraz, E.M.N.; Rodal, M.J.N.; Sampaio, E.V.S.B.; Pereira, R.C.A.	1998	Revista Brasileira de Botânica	21(1)	7-15
77	PE	Crystalline Caatinga	Pessoa, L.M.; Rodal, M.J.N.; Silva, A.C.B.L.; Costa, K.C.C.	2004	Revista Nordestina de Biologia	18(1)	27-53
78	PE	Crystalline Caatinga	Rodal, M.J.N.; Costa, K.C.C.; Lins e Silva, A.C.B.	2008	Hoehnea	35(2)	209-217
79	PE	Crystalline Caatinga	Rodal, M.J.N.; Martins, F.R.; Sampaio, E.V.S.B.	2008	Revista Caatinga	21(3)	192-205
80	PE	Crystalline Caatinga	Rodal, M.J.N.; Martins, F.R.; Sampaio, E.V.S.B.	2008	Revista Caatinga	21(3)	192-205
81	PE	Crystalline Caatinga	Rodal, M.J.N.; Martins, F.R.; Sampaio, E.V.S.B.	2008	Revista Caatinga	21(3)	192-205
82	PE	Crystalline Caatinga	Rodal, M.J.N.; Martins, F.R.; Sampaio, E.V.S.B.	2008	Revista Caatinga	21(3)	192-205
83	PE	Crystalline Caatinga	Santos, M.F.A.V.; Guerra, T.N.F.; Sotero, M.C.; Santos, J.I.N.	2009	Rodriguésia	60(2)	389-402
84	RN	Crystalline Caatinga	Amorim, I.L.; Sampaio, E.V.S.B.; Araújo, E.L.	2005	Acta Botanica Brasilica	19(3)	615-623
85	RN	Crystalline Caatinga	Santana, J.A.S.; Pimenta, A.S.; Souto, J.S.; Almeida, F.V.; Pacheco, M.V.	2009	Revista Verde	4(4)	83-89
86	RN	Crystalline Caatinga	Santos, L.C.; Moura, V.C.; Sizenando Filho, F.A.; Mesquita, L.X.; Costa, Y.C.S.	2006	Revista Verde	1(2)	86-99
87	BA	Inselberg	França, F.; Melo, E.; Santos, A.K.A.; Melo, J.A.N.; Marques, M.; Silva-Filho, M.F.B.; Moraes, L.; Machado, C.	2005	Hoehnea	32(1)	93-101
88	BA	Inselberg	França, F.; Melo, E.; Santos, C.C.	1997	Sitientibus	17	163-176
89	BA	Inselberg	França, F.; Melo, E.; Santos, C.C.	1997	Sitientibus	17	163-184
90	CE	Inselberg	Araújo, F.S.; Oliveira, R.F.; Lima-Verde, L.W.	2008	Rodriguésia	59(4)	659-671
91	PB	Inselberg	Fevereiro, P.C.A.; Fevereiro, V.P.B.	1980	Agropecuária Técnica	1(1)	126-131
92	PB	Inselberg	Porto, P.A.F.; Almeida, A.; Pessoa, W.J.; Trovão, D.; Félix, L.P.	2008	Revista Caatinga	21(2)	214-222
93	PB	Inselberg	Tölke, E.E.A.; Silva, J.B.; Pereira, A.R.L.; Melo, J.I.M.	2011	Biotemas	24(4)	39-48
94	PE	Inselberg	Gomes, P.; Alves, M.	2009	Edinburgh Journal of Botany	66(2)	329-346
95	PE	Inselberg	Gomes, P.; Alves, M.	2010	Revista Brasileira de Botânica	33(4)	661-676
96	PE	Inselberg	Gomes, P.; Alves, M.	2010	Revista Brasileira de Botânica	33(4)	661-676

97	PE	Inselberg	Gomes, P.; Costa, K.C.C.; Rodal, M.J.N.; Alves, M.	2011	Check List	7(2)	173-181
98	PB	Riverine forest	Andrade, L.A.; Fabricante, J.R.; Alves, A.S.	2008	Natureza & Conservação	6(2)	61-67
99	PB	Riverine forest	Lacerda, A.V.; Barbosa, F.M.; Barbosa, M.R.V.	2007	Oecologia Brasiliensis	11(3)	331-340
100	PB	Riverine forest	Lacerda, A.V.; Barbosa, F.M.; Soares, J.J.; Barbosa, M.R.V.	2010	Biota Neotropica	10(4)	275-284
101	PB	Riverine forest	Lacerda, A.V.; Barbosa, F.M.; Soares, J.J.; Barbosa, M.R.V.	2010	Biota Neotropica	10(4)	275-284
102	PB	Riverine forest	Lacerda, A.V.; Barbosa, F.M.; Soares, J.J.; Barbosa, M.R.V.	2010	Biota Neotropica	10(4)	275-284
103	PB	Riverine forest	Pegado, C.M.A.; Andrade, L.A.; Félix, L.P.; Pereira, I.M.	2006	Acta Botanica Brasilica	20(4)	887-898
104	PB	Riverine forest	Trovão, D.M.B.M.; Freire, A.M.; Melo, J.I.M.	2010	Revista Caatinga	23(2)	78-86
105	PE	Riverine forest	Ferraz, J.S.F.; Albuquerque, U.P.; Meunier, I.M.J.	2006	Acta Botanica Brasilica	20(1)	125-134
106	PE	Riverine forest	Nascimento, C.E.S.; Rodal, M.J.N.; Cavalcanti, A.C.	2003	Revista Brasileira de Botânica	26(3)	271-287
107	PE	Riverine forest	Souza, J.A.N.; Rodal, M.J.N.	2010	Revista Caatinga	23(4)	54-62
108	BA	Sedimentary Caatinga	Guedes, R.R.	1985	Rodriguésia	37(62)	5-8
109	BA	Sedimentary Caatinga	Rocha, P.L.B.; Queiroz, L.P.; Pirani, J.R.	2004	Revista Brasileira de Botânica	27(4)	739-755
110	CE	Sedimentary Caatinga	Araújo, F.S.; Costa, R.C.; Lima, J.R.; Vasconcelos, S.F.; Girão, L.C.; Sobrinho, M.S.; Bruno, M.M.A.; Souza, S.S.G. *et al.*	2011	Rodriguésia	62(2)	341-366
111	CE	Sedimentary Caatinga	Araújo, F.S.; Costa, R.C.; Lima, J.R.; Vasconcelos, S.F.; Girão, L.C.; Sobrinho, M.S.; Bruno, M.M.A.; Souza, S.S.G. *et al.* (includes Lima et al 2009)	2011	Rodriguésia	62(2)	341-366
112	CE	Sedimentary Caatinga	Araújo, F.S.; Martins, F.R.; Shepherd, G.J.	1999	Revista Brasileira de Biologia	59(4)	663-678
113	CE	Sedimentary Caatinga	Araújo, F.S.; Sampaio, E.V.S.B.; Figueiredo, M.A.; Rodal, M.J.N.; Fernandes, A.G.	1998	Revista Brasileira de Botânica	21(2)	105-116
114	CE	Sedimentary Caatinga	Araújo, F.S.; Sampaio, E.V.S.B.; Rodal, M.J.N.; Figueiredo, M.A.	1998	Revista Brasileira de Biologia	58(1)	85-95
115	CE	Sedimentary Caatinga	Araújo, F.S.; Sampaio, E.V.S.B.; Rodal, M.J.N.; Figueiredo, M.A.	1998	Revista Brasileira de Biologia	58(1)	85-95
116	CE	Sedimentary Caatinga	Araújo, F.S.; Sampaio, E.V.S.B.; Rodal, M.J.N.; Figueiredo, M.A.	1998	Revista Brasileira de Biologia	58(1)	85-95
117	CE	Sedimentary Caatinga	Vasconcelos, S.F.; Araújo, F.S.; Lopes, A.V.	2010	Biodiversity & Conservation	19	2263-2289
118	PE	Sedimentary Caatinga	Andrade, K.V.S.A.; Rodal, M.J.N.; Lucena, M.F.A.; Gomes, A.P.S.	2004	Hoehnea	31(3)	337-348

119	PE	Sedimentary Caatinga	Figueiredo, L.S.; Rodal, M.J.N.; Melo, A.L.	2000	Naturalia	25	205-224
120	PE	Sedimentary Caatinga	Gomes, A.P.S.; Rodal, M.J.N.; Melo, A.L.	2006	Acta Botanica Brasilica	20(1)	37-48
121	PE	Sedimentary Caatinga	Rodal, M.J.N.; Andrade, K.V.A.; Sales, M.F.; Gomes, A.P.S.	1998	Revista Brasileira de Biologia	58(3)	517-526
122	PE	Sedimentary Caatinga	Rodal, M.J.N.; Nascimento, L.M.; Melo, A.L.	1999	Acta Botanica Brasilica	13(1)	15-28
123	PI	Sedimentary Caatinga	Emperaire, L.	1987	Bull. Ecol.	18(4)	431-438
124	PI	Sedimentary Caatinga	Mendes, M.R.A.; Castro, A.A.J.F.	2010	Check List	6(1)	39-44
125	PI	Sedimentary Caatinga	Oliveira, M.E.A.; Sampaio, E.V.S.B.; Castro, A.A.J.F.; Rodal M.J.N.	1997	Naturalia	22	131-150
126	CE	Transition crystalline/sedimentary	Lemos, J.R.; Meguro, M.	2010	Revista Brasileira de Biociências	8(1)	34-43
127	PE	Transition crystalline/sedimentary	Araújo, E.L.; Sampaio, E.V.S.B.; Rodal, M.J.N.	1995	Revista Brasileira de Biologia	55(4)	595-607
128	PE	Transition crystalline/sedimentary	Pinheiro, K.; Rodal, M.J.N.; Alves, M.	2010	Revista Caatinga	23(2)	68-77
129	PE	Transition crystalline/sedimentary	Silva, K.A.; Araújo, E.L.; Ferraz, E.M.N.	2009	Acta Botanica Brasilica	23(1)	100-110
130	PI	Transition crystalline/sedimentary	Lemos, J.R.	2004	Rodriguésia	55(85)	55-66
131	PI	Transition crystalline/sedimentary	Lemos, J.R.; Rodal, M.J.N.	2002	Acta Botanica Brasilica	16(1)	23-42

Appendix 2- Catalogue with all names reported in the 131 floristic and phytosociological papers compiled by this study. Numbers in brackets represent the number of records of each species with a given habit, Raunkiaer life-form or within a Brazilian state. Environment types: **Arb**- Arboreal Caatinga in Northern Minas Gerais; **Aqua**- aquatic ecosystems; **Agre**- Agreste ecotone between the Caatinga and Atlantic forest; **CMaior**- Caatinga in the Campo Maior Ecotone to the Cerrado; **Cryst**-Crystalline Caatinga; **Diam**- Caatinga in the Chapada Diamantina highlands; **Ins**- Inselbergs; **Riv**- Riverine forests; **Sed**- Sedimentary Caatinga; **Trans**- Transtional sites between Crystalline and Sedimentary Caatinga; **Unc**- Unclassified areas.

Reported Brazilian states: **BA**- Bahia; **CE**- Ceará; **MG**- Minas Gerais; **PB**- Paraíba; **PE**- Pernambuco; **PI**-Piauí; **RN**- Rio Grande do Norte. The ecological data (e.g. habit, life-forms) associated with each species depend on the availability of such data in the original floristic/phytosociological papers.

Lycophytes

SELAGINELLACEAE (1 genus; 4 species)

Selaginella (4 species)

Selaginella convoluta (Arn.) Spring **Habits:** herb(1). **Life forms:** hemicryptophyte(1). **States:** BA(1); PB(1); PE(5); RN(1). **Habitats:** Cryst, Ins, Unc.

Selaginella potaroensis Jenman **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Selaginella sellowii Hieron. **States:** PE(1). **Habitats:** Cryst.

Selaginella sulcata (Desv. ex Poir.) Spring **States:** PE(1). **Habitats:** Agre.

Pteridophytes

ANEMIACEAE (1 genus; 1 species)

Anemia (1 species)

Anemia flexuosa Sw. **Life forms:** chamaephyte(1). **States:** PE(2). **Habitats:** Ins.

POLYPODIACEAE (3 genera; 4 species)

Microgramma (2 species)

Microgramma geminata (Schrad.) R.M.Tryon & A.F.Tryon **Life forms:** phanerophyte(1). **States:** BA(2); PE(1). **Habitats:** Ins.

Microgramma vacciniifolia (Langsd. & Fisch.) Copel. **Life forms:** epiphyte(1); phanerophyte(1). **States:** BA(2); PE(1). **Habitats:** Ins.

Pleopeltis (1 species)

Pleopeltis polypodioides var. ***burchellii*** (Baker) A.R.Sm. [Synonyms: *Polypodium polypodioides* (L.) Watt] **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Serpocaulon (1 species)

Serpocaulon triseriale (Sw.) A.R.Sm. [Synonyms: *Polypodium triseriale* Sw.] **States:** BA(1). **Habitats:** Ins.

PTERIDACEAE (3 genera; 4 species)

Ceratopteris (1 species)

Ceratopteris pteridoides (Hook.) Hieron. **States:** BA(1). **Habitats:** Aqua.

Doryopteris (2 species)

Doryopteris ornithopus (Hook. & Baker) J. Sm. **Life forms:** cryptophyte-geo(1). **States:** BA(2). **Habitats:** Ins.

Doryopteris pedata (L.) Fée **Life forms:** chamaephyte(1). **States:** PE(2). **Habitats:** Ins.

Hemionitis (1 species)

Hemionitis tomentosa (Lam.) Raddi **States:** BA(1). **Habitats:** Ins.

SALVINIACEAE (2 genera; 5 species)

Azolla (2 species)

Azolla caroliniana Willd. **States:** BA(1). **Habitats:** Aqua.

Azolla filiculoides Lam. **States:** BA(5). **Habitats:** Aqua.

Salvinia (3 species)

Salvinia auriculata Aubl. **States:** BA(3). **Habitats:** Aqua.

Salvinia minima Baker **States:** BA(4). **Habitats:** Aqua.

Salvinia oblongifolia Mart. **States:** BA(3). **Habitats:** Aqua.

THELYPTERIDACEAE (1 genus; 1 species)

Thelypteris (1 species)

Thelypteris interrupta (Willd.) K.Iwats. **States:** BA(3). **Habitats:** Aqua.

Angiosperms

ACANTHACEAE (7 genera; 14 species)

Anisacanthus (1 species)

Anisacanthus trilobus Lindau **Habits:** shrub(1); subshrub(3). **Life forms:** chamaephyte(2). **States:** CE(3); PI(3). **Habitats:** Cryst, Sed, Trans.

Dicliptera (1 species)

Dicliptera ciliaris Juss. **Habits:** herb(2); subshrub(2). **Life forms:** chamaephyte(3). **States:** CE(5). **Habitats:** Cryst, Sed, Trans.

Dyschoriste (1 species)

Dyschoriste maranhonis (Nees) Kuntze **Life forms:** therophyte(1). **States:** PE(2). **Habitats:** Ins.

Elytraria (1 species)

Elytraria imbricata (Vahl) Pers. **Habits:** herb(1). **States:** PE(1). **Habitats:** Trans.

Harpochilus (2 species)

Harpochilus neesianus Mart. ex Nees **Habits:** shrub(3). **States:** BA(2); PE(2). **Habitats:** Sed.

Harpochilus phaeocarpus Nees **States:** BA(1). **Habitats:** Sed.

Justicia (3 species)

Justicia aequilabris (Nees) Lindau [Synonyms: *Justicia strobilacea* (Nees) Lindau] **Habits:** herb(1); shrub(5). **Life forms:** chamaephyte(1); phanerophyte(2). **States:** CE(6); PE(2). **Habitats:** Cryst, Sed, Trans.

Justicia fragilis Mart., This name has been misapplied in Ceará state. The Brazilian species known as *Justicia fragilis* is not that described by Wall. but to date it has not been possible to determine the correct name for this species. A new name may be required. (A.L Cortes pers. comm.). **Habits:** herb(1); subshrub(2). **Life forms:** chamaephyte(2). **States:** CE(4). **Habitats:** Sed.

Justicia schomburgkiana (Nees) V.A.W.Graham **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Cryst.

Ruellia (5 species)

Ruellia asperula (Mart. ex Ness) Lindau **Life forms:** chamaephyte. **States:** BA(1); CE(1); PE(6); PI(1). **Habitats:** Agre, Aqua, Cryst, Ins, Trans.

Ruellia bahiensis (Nees) Morong **Habits:** herb(1); subshrub(2). **Life forms:** chamaephyte(1). **States:** BA(2); CE(2); PE(2). **Habitats:** Agre, Aqua, Ins, Sed, Trans.

Ruellia geminiflora Kunth **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** PB(1); PE(2). **Habitats:** Agre, Cryst.

Ruellia paniculata L. **Habits:** shrub(4); subshrub(2). **Life forms:** chamaephyte(2). **States:** BA(2); CE(2); PE(4). **Habitats:** Aqua, Cryst, Riv, Sed, Trans.

Ruellia villosa (Nees) Lindau **Habits:** subshrub(2). **Life forms:** chamaephyte(2). **States:** CE(2). **Habitats:** Sed.

ACHARIACEAE (1 genus; 1 species)

Lindackeria (1 species)

Lindackeria ovata (Benth.) Gilg **Habits:** shrub(1); tree(1). **Life forms:** phanerophyte(1). **States:** CE(4). **Habitats:** Sed.

AIZOACEAE (1 genus; 1 species)

Trianthema (1 species)

Trianthema portulacastrum L. **States:** RN(1). **Habitats:** Cryst.

ALISMATACEAE (1 genus; 4 species)

Echinodorus (4 species)

Echinodorus glandulosus Rataj **Habits:** herb(1). **States:** CE(1). **Habitats:** Trans.

Echinodorus grandiflorus (Cham. & Schltr.) Micheli **States:** BA(3). **Habitats:** Aqua.

Echinodorus subalatus (Mart.) Griseb. **Life forms:** hemicryptophyte(1). **States:** BA(1); CE(1). **Habitats:** Aqua, Cryst.

Echinodorus tenellus (Mart.) Buchenau **States:** BA(1). **Habitats:** Aqua.

ALSTROEMERIACEAE (2 genera; 4 species)

Alstroemeria (3 species)

Alstroemeria isabellana Herb. [Synonyms: *Alstroemeria campaniflora* Hand.-Mazz.] **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Alstroemeria longistaminea Mart. ex Schult. & Schult. **States:** PE(1). **Habitats:** Ins.

Alstroemeria piauhyensis Gardner **Life forms:** cryptophyte-geo(1). **States:** PI(1). **Habitats:** Sed.

Bomarea (1 species)

Bomarea edulis (Tussac) Herb. [Synonyms: *Bomarea salsilloides* (Mart.) M.Roem.] **Habits:** herb(3). **Life forms:** cryptophyte-geo(3). **States:** CE(1); PB(1); PE(5). **Habitats:** Agre, Ins, Sed.

AMARANTHACEAE (6 genera; 13 species)

Alternanthera (5 species)

Alternanthera bettzichiana (Regel) G.Nicholson [Synonyms: *Alternanthera amabilis* Lem.] **Habits:** herb(1). **States:** BA(1). **Habitats:** Sed.

Alternanthera brasiliana (L.) Kuntze **Habits:** herb(7). **Life forms:** therophyte(6). **States:** BA(2); CE(8); PB(1); PE(7). **Habitats:** Agre, Cryst, Ins, Sed, Trans, Unc, Cryst, Sed.

Alternanthera pungens Kunth **States:** PE(1). **Habitats:** Aqua.

Alternanthera ramosissima (Mart.) Chodat **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

Alternanthera tenella Colla [Synonyms: *Alternanthera ficoidea* (L.) P.Beauv.; *Alternanthera polygonoides* (L.) R.Br.] **Habits:** herb(4); shrub(1). **Life forms:** hemicryptophyte(2); therophyte(3). **States:** BA(1); CE(1); PE(6); RN(1). **Habitats:** Aqua, Cryst, Trans.

Amaranthus (1 species)

Amaranthus viridis L. **Habits:** herb(2); subshrub(1). **Life forms:** therophyte(2). **States:** BA(1); PE(3). **Habitats:** Ins, Riv, Trans.

Chamissoa (1 species)

Chamissoa altissima (Jacq.) Kunth **States:** PB(1). **Habitats:** Cryst.

Froelichia (1 species)

Froelichia humboldtiana (Roem. & Schult.) Seub. [Synonyms: *Froelichia lanata* Moench] **Habits:** herb(3). **Life forms:** hemicryptophyte(1); therophyte(2). **States:** CE(3); PE(2); RN(2). **Habitats:** Cryst, Ins, Sed, Unc.

Gomphrena (3 species)

Gomphrena demissa Mart. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** BA(1); CE(1); PE(1); RN(1). **Habitats:** Aqua, Sed, Unc.

Gomphrena desertorum Mart. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Cryst.

Gomphrena vaga Mart. [Synonyms: *Gomphrena holosericea* (Mart.) Moq.] **Habits:** herb(5); shrub(1). **Life forms:** cryptophyte-geo(1); hemicryptophyte(2). **States:** BA(3); PB(1); PE(7). **Habitats:** Agre, Cryst, Ins, Sed, Trans.

Pfaffia (2 species)

Pfaffia denudata (Moq.) Kuntze **States:** BA(1). **Habitats:** Sed.

Pfaffia glomerata (Spreng.) Pedersen **States:** PB(1). **Habitats:** Agre.

AMARYLLIDACEAE (3 genera; 6 species)

Habranthus (2 species)

Habranthus itaobinus Ravenna **Life forms:** cryptophyte-geo(1). **States:** PE(2). **Habitats:** Ins.

Habranthus ruber Ravenna **States:** BA(1). **Observations:** This species is registered only from the south of Brazil by Flora do Brasil and this record probably represents a misidentification. **Habitats:** Ins.

Hippeastrum (2 species)

Hippeastrum solandriflorum (Lindl.) Herb. **Life forms:** cryptophyte-geo(1). **States:** PI(1). **Habitats:** Sed.

Hippeastrum stylosum Herb. **Life forms:** cryptophyte-geo(2). **States:** PE(3). **Habitats:** Ins.

Zephyranthes (2 species)

Zephyranthes cearensis (Herb.) Baker **Life forms:** cryptophyte-geo(1). **States:** CE(1). **Habitats:** Ins.

Zephyranthes sylvatica (Mart.) Baker **Life forms:** cryptophyte-geo(1). **States:** PI(1). **Habitats:** Sed.

ANACARDIACEAE (7 genera; 7 species)

Anacardium (1 species)

Anacardium occidentale L. **Habits:** tree(3). **Life forms:** microphanerophyte(1). **States:** PE(5); PI(3). **Habitats:** CMaior, Ins, Sed.

Apterokarpos (1 species)

Apterokarpos gardneri (Engl.) Rizzini **Life forms:** phanerophyte(1). **States:** PI(1). **Habitats:** Sed.

Astronium (1 species)

Astronium fraxinifolium Schott **Habits:** tree(2). **States:** MG(1); PI(3). **Habitats:** Arb, CMaior, Trans.

Cyrtocarpa (1 species)

Cyrtocarpa caatingae J.D.Mitch. & Daly **States:** MG(1). **Habitats:** Arb.

Myracrodruon (1 species)

Myracrodruon urundeuva Allemão [Synonyms: *Astronium urundeuva* (Allemão) Engl.] **Habits:** tree(15). **Life forms:** phanerophyte(5). **States:** BA(4); CE(8); MG(11); PB(21); PE(26); PI(3); RN(8). **Habitats:** Agre, Arb, CMaior, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

Schinopsis (1 species)

Schinopsis brasiliensis Engl. **Habits:** tree(13). **Life forms:** phanerophyte(1). **States:** BA(3); CE(1); MG(10); PB(17); PE(16); RN(1). **Habitats:** Agre, Arb, Cryst, Diam, Riv, Sed, Trans, Unc, Riv.

Schinopsis brasiliensis var. ***glabra*** Engl. [Synonyms: *Schinopsis glabra* Burkl. ex Mey.] **Habits:** tree(1). **States:** PB(1); PE(4). **Habitats:** Cryst, Trans, Unc.

Spondias (1 species)

Spondias tuberosa Arruda **Habits:** tree(14). **Life forms:** phanerophyte(2). **States:** BA(6); CE(2); MG(7); PB(14); PE(18); PI(2); RN(2). **Habitats:** Agre, Arb, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

ANNONACEAE (5 genera; 11 species)

Annona (4 species)

Annona glabra L. **States:** BA(1). **Habitats:** Diam.

Annona leptopetala (R.E.Fr.) H.Rainer [Synonyms: *Rollinia leptopetala* R.E.Fr.; *Rolliniopsis leptopetala* (R.E.Fr.) Saff.] **Habits:** shrub(7); tree(10); treelet(1). **Life forms:** nanophanerophyte(1); phanerophyte(3). **States:** BA(2); CE(10); PB(3); PE(10); PI(6). **Habitats:** Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

Annona spinescens Mart. **Habits:** tree(1). **States:** BA(1). **Habitats:** Sed.

Annona sylvatica A.St.-Hil. [Synonyms: *Rollinia sylvatica* (A.St.-Hil.) Mart.] **States:** MG(2). **Habitats:** Arb.

Duguetia (1 species)

Duguetia riedeliana R.E.Fr. **Habits:** shrub(1); tree(1). **Life forms:** phanerophyte(1). **States:** CE(2). **Habitats:** Sed.

Ephedranthus (1 species)

Ephedranthus pisocarpus R.E.Fr. **Habits:** shrub(1); tree(5). **Life forms:** phanerophyte(2). **States:** CE(7); PI(6). **Habitats:** CMaior, Sed, Trans.

Oxandra (2 species)

Oxandra reticulata Maas **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

Oxandra sessiliflora R.E.Fr. **States:** PI(1). **Habitats:** Sed.

Xylopia (3 species)

Xylopia aromatica (Lam.) Mart. **States:** BA(1). **Habitats:** Diam.

Xylopia laevigata (Mart.) R.E.Fr. **Habits:** tree(1). **States:** PI(1). **Habitats:** Trans.

Xylopia sericea A.St.-Hil. **Habits:** tree(1). **States:** PI(1). **Habitats:** Trans.

APIACEAE (1 genus; 1 species)

Spananthe (1 species)

Spananthe paniculata Jacq. **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

APOCYNACEAE (17 genera; 43 species)

Allamanda (2 species)

Allamanda blanchetii A.DC. **Habits:** climb.(1); liana(3); shrub(7). **Life forms:** hemicryptophyte(5). **States:** BA(1); CE(5); PB(3); PE(7); PI(4); RN(1). **Habitats:** CMaior, Cryst, Ins, Riv, Sed, Unc.

Allamanda puberula A.DC. **Habits:** shrub(2). **States:** BA(1); PI(2). **Habitats:** Sed, Trans.

Asclepias (1 species)

Asclepias curassavica L. **Habits:** herb(1); subshrub(1). **States:** CE(1); PE(1). **Habitats:** Sed, Trans.

Aspidosperma (10 species)

Aspidosperma cuspa (Kunth) S.F.Blake ex Pittier **Habits:** tree(2). **Life forms:** phanerophyte(1). **States:** CE(1); PI(4). **Habitats:** CMaior, Cryst.

Aspidosperma cylindrocarpon Müll.Arg. **States:** BA(1). **Habitats:** Diam.

Aspidosperma discolor A.DC. **Habits:** shrub(1); tree(1). **Life forms:** phanerophyte(1). **States:** CE(5); PB(1). **Habitats:** Agre, Sed.

Aspidosperma multiflorum A.DC. **Habits:** shrub(4); tree(4). **Life forms:** phanerophyte(2). **States:** CE(6); PI(9). **Habitats:** CMaior, Sed, Trans.

Aspidosperma polyneuron Müll.Arg. **States:** MG(1). **Habitats:** Arb.

Aspidosperma pyricollum Müll.Arg. **States:** BA(1). **Habitats:** Ins.

Aspidosperma pyrifolium Mart. [Synonyms: *Aspidosperma refractum* Mart.] **Habits:** shrub(2); tree(19). **Life forms:** phanerophyte(4). **States:** BA(2); CE(6); MG(10); PB(27); PE(27); PI(5); RN(30). **Habitats:** Agre, Arb, CMaior, Cryst, Ins, Riv, Sed, Trans, Unc.

Aspidosperma ramiflorum Müll.Arg. **States:** BA(1). **Habitats:** Diam.

Aspidosperma riedelii Müll.Arg. **States:** PI(1). **Habitats:** Sed.

Aspidosperma subincanum Mart. **Habits:** tree(3). **Life forms:** phanerophyte(1). **States:** CE(6); PI(4). **Habitats:** CMaior, Sed.

Blepharodon (2 species)

Blepharodon manicatum (Decne.) Fontella **States:** PE(1). **Habitats:** Ins.

Blepharodon pictum (Vahl) W.D.Stevens [Synonyms: *Blepharodon nitidum* (Vell.) J.F. Macbr.] **Habits:** climber(1). **States:** PE(1). **Habitats:** Sed.

Cynanchum (2 species)

Cynanchum montevidense Spreng. [Synonyms: *Roulinia montevidensis* (Spreng.) Malme] **States:** BA(1). **Habitats:** Aqua.

Cynanchum roulinioides (E.Fourn.) Rapini **Habits:** liana(1). **States:** CE(1). **Habitats:** Trans.

Ditassa (4 species)

Ditassa capillaris E.Fourn. **Habits:** climber(2). **States:** BA(1); PE(2). **Habitats:** Ins, Sed.

Ditassa glaziovii E.Fourn., According to specialist A.Rapini this name was originally published with the spelling *Ditassa glaziovi*, but in the "Lista de species da Flora do Brasil (2010)" Rapini preferred the spelling *Ditassa glazioui*, while T. Konno used the spelling *D. glaziovii*. Here we follow the orthography used in IPNI (www.ipni.org), accessed June 2012. **Habits:** climber(1). **Life forms:** ?(1). **States:** PE(2). **Habitats:** Cryst, Ins.

Ditassa hastata Decne. **Life forms:** liana(1). **States:** BA(3); PE(1). **Habitats:** Ins.

Ditassa oxyphylla Turcz. **Habits:** climber(1). **Life forms:** phanerophyte(1). **States:** PE(3). **Habitats:** Ins, Sed.

Mandevilla (4 species)

Mandevilla dardanoi M.F.Sales, Kin.-Gouv. & A.O.Simões **Life forms:** phanerophyte(2). **States:** PE(3). **Habitats:** Ins.

Mandevilla funiformis (Vell.) K.Schum. **States:** BA(2). **Habitats:** Ins.

Mandevilla scabra (Hoffmanns. ex Roem. & Schult.) K.Schum. **Habits:** climber(1); liana(1). **Life forms:** chamaephyte(1); cryptophyte-geo(2). **States:** CE(1); PB(1); PE(4). **Habitats:** Ins, Sed, Agre.

Mandevilla tenuifolia (J.C.Mikan) Woodson **Habits:** climber(1); herb(2); liana(1). **Life forms:** cryptophyte-geo(4); therophyte(1). **States:** BA(1); CE(3); PB(2); PE(4). **Habitats:** Ins, Sed, Trans.

Marsdenia (4 species)

Marsdenia altissima (Jacq.) Dugand **Habits:** climber(1). **States:** PE(1). **Habitats:** Trans.

Marsdenia dorothyae Fontella & Morillo **Habits:** climber(1). **Life forms:** ?(1). **States:** PE(1). **Habitats:** Cryst.

Marsdenia loniceroides (Hook.) E.Fourn. **Life forms:** phanerophyte(2). **States:** BA(1); PE(3). **Habitats:** Ins.

Marsdenia megalantha Goyder & Morillo **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Ins.

Matelea (4 species)

Matelea ganglinosa (Vell.) Rapini [Synonyms: *Gonolobus cearensis* Malme; *Matelea maritima* subsp. *ganglinosa* (Vell.) Fontella] **States:** PE(1). **Habitats:** Ins.

Matelea harleyi Fontella & Morillo **Habits:** liana(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Cryst.

Matelea maritima (Vell.) Fontella **Life forms:** phanerophyte(1). **States:** BA(2); PB(2); PE(4). **Habitats:** Agre, Ins, Sed, Trans.

Matelea nigra (Decne.) Morillo & Fontella **States:** PE(1). **Habitats:** Ins.

Petalostelma (1 species)

Petalostelma martianum E.Fourn. **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Prestonia (2 species)

Prestonia bahiensis Müll.Arg. **Habits:** liana(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Prestonia coalita (Vell.) Woodson **States:** BA(2). **Habitats:** Ins.

Schubertia (1 species)

Schubertia multiflora Mart. **Life forms:** liana(1). **States:** PI(1). **Habitats:** Sed.

Secondatia (1 species)

Secondatia floribunda A.DC. [Synonyms: *Secondatia foliosa* A.DC.] **Habits:** liana(1); shrub(1). **Life forms:** phanerophyte(1). **States:** CE(3). **Habitats:** Sed.

Skytanthus (1 species)

Skytanthus hancorniifolius (A.DC.) Miers **Habits:** climber(1). **States:** BA(1); PE(1). **Habitats:** Ins, Sed.

Tabernaemontana (2 species)

Tabernaemontana catharinensis A.DC. **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Tabernaemontana hystrix Steud. **Habits:** treelet(1). **States:** PI(3). **Habitats:** CMaior.

Tassadia (1 species)

Tassadia burchellii E.Fourn. **Habits:** liana(1). **Life forms:** phanerophyte(1). **States:** CE(2). **Habitats:** Sed.

Temnadenia (1 species)

Temnadenia violacea (Vell.) Miers **Habits:** climber(2). **States:** PE(2). **Habitats:** Sed.

AQUIFOLIACEAE (1 genus; 1 species)

Ilex (1 species)

Ilex brevicuspis Reissek **States:** MG(3). **Habitats:** Arb.

ARACEAE (10 genera; 16 species)

Anthurium (3 species)

Anthurium affine Schott **Habits:** epiphyte(1); herb(1). **Life forms:** chamaephyte(2); hemicryptophyte(1). **States:** BA(3); PE(6). **Habitats:** Agre, Ins, Sed.

Anthurium gracile (Rudge) Lindl. **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Anthurium petrophilum K.Krause **Life forms:** chamaephyte(1). **States:** BA(1); PB(1). **Habitats:** Ins.

Lemna (2 species)

Lemna aequinoctialis Welw. **States:** BA(4). **Habitats:** Aqua.

Lemna valdiviana Phil. **States:** BA(6). **Habitats:** Aqua.

Philodendron (4 species)

Philodendron acutatum Schott **Life forms:** hemicryptophyte(1); phanerophyte(1). **States:** CE(1); PE(1). **Habitats:** Ins.

Philodendron bipinnatifidum Schott **States:** PE(1). **Habitats:** Ins.

Philodendron imbe Schott ex Endl. **States:** BA(2). **Habitats:** Ins.

Observations: According to specialist M.O. Pellegrini, the name *Philodendron imbe* has been misapplied to

various species in Brazil, and Caatinga records of *P. imbe* are almost certainly a misuse of the name. A review by "Mayo & Sakuragui (2011) Typification and interpretation of *Philodendron imbe* Schott ex Kunth (Araceae). Taxon 60(6): 1764-1767", calls attention to the fact that *Philodendron imbe* is rare or may even be extinct, and that the name has been misapplied to other species.

Philodendron leal-costae Mayo & G.M.Barroso **Life forms:** phanerophyte(1). **States:** BA(2); PE(1). **Habitats:** Ins.

Pistia (1 species)

Pistia stratiotes L. **Habits:** herb(1). **States:** BA(7); PI(1). **Observations:** Planta aquática listada no trabalho. **Habitats:** Aqua, Trans.

Scaphispatha (1 species)

Scaphispatha gracilis Brongn. ex Schott **Habits:** herb(1). **Life forms:** cryptophyte-geo(1). **States:** CE(1). **Habitats:** Sed.

Spathicarpa (1 species)

Spathicarpa hastifolia Hook. **Habits:** herb(1). **Life forms:** cryptophyte-geo(1). **States:** CE(1). **Habitats:** Sed.

Taccarum (1 species)

Taccarum peregrinum (Schott) Engl. **Habits:** herb(1). **Life forms:** cryptophyte(1); cryptophyte-geo(2). **States:** CE(2); PI(1). **Habitats:** Cryst, Sed.

Wolffia (1 species)

Wolffia brasiliensis Wedd. **States:** BA(5). **Habitats:** Aqua.

Wolffiella (1 species)

Wolffiella welwitschii (Hegelm.) Monod **States:** BA(5). **Habitats:** Aqua.

Zomicarpa (1 species)

Zomicarpa riedelianum Schott **Habits:** herb(1). **States:** PE(1). **Habitats:** Agre.

ARALIACEAE (1 genus; 2 species)

Aralia (2 species)

Aralia excelsa (Griseb.) J.Wen [Synonyms: *Sciadodendron excelsum* Griseb.] **States:** MG(5). **Habitats:** Arb.

Aralia warmingiana (Marchal) J.Wen [Synonyms: *Coudenbergia warmingiana* (Marchal) Marchal] **Habits:** tree(2). **States:** PE(3). **Habitats:** Cryst.

ARECACEAE (3 genera; 5 species)

Astrocaryum (1 species)

Astrocaryum vulgare Mart. **States:** PI(1). **Habitats:** CMaior.

Copernicia (1 species)

Copernicia prunifera (Mill.) H.E.Moore [Synonyms: *Copernicia cerifera* (Arruda) Mart.] **Habits:** tree(1). **States:** PB(1); PE(1); PI(1); RN(1). **Habitats:** CMaior, Riv, Unc.

Syagrus (3 species)

Syagrus coronata (Mart.) Becc. **States:** BA(5); PE(2); RN(1). **Habitats:** Diam, Ins, Trans, Unc.

Syagrus oleracea (Mart.) Becc. **Habits:** tree(1). **States:** MG(8); PE(2). **Habitats:** Arb, Cryst.

Syagrus vagans (Bondar) A.D.Hawkes **States:** BA(3). **Habitats:** Ins.

ARISTOLOCHIACEAE (1 genus; 1 species)

Aristolochia (1 species)

Aristolochia birostris Duch. **Habits:** climber(3). **Life forms:** chamaephyte(2); liana(1); phanerophyte(1). **States:** BA(1); PB(2); PE(3). **Habitats:** Agre, Ins, Trans.

ASTERACEAE (48 genera; 66 species)

Acanthospermum (1 species)

Acanthospermum hispidum DC. **Habits:** herb(1); subshrub(1). **Life forms:** therophyte(1). **States:** PB(1); PE(2). **Habitats:** Aqua, Ins, Trans.

Achyrocline (1 species)

Achyrocline satureioides (Lam.) DC. **Habits:** subshrub(1). **Life forms:** therophyte(1). **States:** PE(2). **Habitats:** Ins, Sed.

Acmella (1 species)

Acmella uliginosa (Sw.) Cass. **Habits:** herb(2). **Life forms:** therophyte(1). **States:** BA(1); CE(1); PE(1). **Habitats:** Aqua, Cryst, Riv.

Acritopappus (1 species)

Acritopappus buiquensis Bautista & D.J.N.Hind **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Ageratum (1 species)

Ageratum conyzoides L. **Habits:** herb(2). **Life forms:** therophyte(3). **States:** BA(1); PB(1); PE(4). **Habitats:** Aqua, Cryst, Ins.

Aspilia (2 species)

Aspilia attenuata (Gardner) Baker **Habits:** herb(1). **Life forms:** therophyte(2). **States:** CE(2). **Habitats:** Cryst, Sed.

Aspilia bonplandiana (Gardner) S.F.Blake **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Baccharis (2 species)

Baccharis oxyodonta DC. **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Baccharis trinervis (Lam.) Pers. [Synonyms: *Baccharis trinervis* (Lam.) Pers. var. *rhexioides* (Kunth) Baker] **Habits:** herb(1). **States:** CE(1). **Habitats:** Sed.

Blainvillea (3 species)

Blainvillea acmella (L.) Philipson [Synonyms: *Blainvillea latifolia* (L.f.) DC.; *Blainvillea rhomboidea* Cass.; *Spilanthes acmella* (L.) Murray] **Habits:** herb(4); subshrub(2). **Life forms:** therophyte(4). **States:** CE(2); PE(3); PI(1). **Habitats:** Cryst, Sed, Trans.

Blainvillea dichotoma (Murray) Stewart **States:** BA(1). **Habitats:** Aqua.

Blainvillea lanceolata Baker, Accepted name according "The Plant List" database, but not recorded in "Lista do Brasil". This is a name with complex taxonomic history, and is probably a missaplied name to Brazilian material **Habits:** herb(3). **Life forms:** chamaephyte(1); therophyte(2). **States:** CE(4). **Habitats:** Cryst, Sed.

Centratherum (1 species)

Centratherum punctatum Cass. **Habits:** herb(6); subshrub(1). **Life forms:** hemicryptophyte(2); therophyte(2). **States:** BA(2); CE(1); PB(1); PE(7); RN(2). **Habitats:** Aqua, Cryst, Ins, Riv, Trans, Unc.

Chresta (1 species)

Chresta martii (DC.) H.Rob. [Synonyms: *Eremanthus martii* (DC.) Baker] **Habits:** herb(1). **States:** PI(1). **Habitats:** Trans.

Conocliniopsis (1 species)

Conocliniopsis prasiifolia (DC.) R.M.King & H.Rob. [Synonyms: *Eupatorium prasiifolium* (DC.) Griseb.] **Habits:** herb(4); shrub(2); subshrub(1). **Life forms:** hemicryptophyte(2); phanerophyte(1). **States:** BA(2); PB(1); PE(7). **Habitats:** Cryst, Ins, Riv, Sed, Trans.

Conyza (1 species)

Conyza bonariensis (L.) Cronquist **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PB(2). **Habitats:** Ins.

Cyrtocymura (2 species)

Cyrtocymura harleyi (H.Rob.) H.Rob. [Synonyms: *Vernonia harleyi* H.Rob.] **States:** BA(1). **Habitats:** Ins.

Cyrtocymura scorpioides (Lam.) H.Rob. [Synonyms: *Vernonia scorpioides* (Lam.) Pers.] **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Dasyphyllum (1 species)

Dasyphyllum sprengelianum (Gardner) Cabrera [Synonyms: *Dasyphyllum sprengelianum* var. *inerme* (Gardner) Cabrera] **Habits:** tree(1). **Life forms:** microphanerophyte(1). **States:** PE(2). **Habitats:** Sed.

Delilia (1 species)

Delilia biflora (L.) Kuntze [Synonyms: *Elvira biflora* (L.) DC.] **Habits:** herb(5). **Life forms:** therophyte(6). **States:** BA(1); CE(2); PB(1); PE(8); RN(3). **Habitats:** Agre, Aqua, Cryst, Ins, Trans, Unc.

Dissothrix (1 species)

Dissothrix imbricata (Gardner) B.L.Rob. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Eclipta (1 species)

Eclipta prostrata (L.) L. [Synonyms: *Eclipta alba* (L.) Hassk.] **Habits:** herb(1). **Life forms:** therophyte(1). **States:** BA(2); PE(4). **Habitats:** Aqua, Ins, Riv.

Egletes (1 species)

Egletes viscosa (L.) Less. **Habits:** herb(1). **States:** CE(1). **Habitats:** Trans.

Emilia (2 species)

Emilia fosbergii Nicolson **Habits:** herb(1); subshrub(1). **Life forms:** therophyte(1). **States:** PE(3). **Habitats:** Ins, Riv, Sed.

Emilia sonchifolia (L.) DC. ex Wight **Habits:** herb(2). **Life forms:** therophyte(4). **States:** PB(1); PE(3). **Habitats:** Ins, Trans.

Enydra (2 species)

Enydra radicans (Willd.) Lack **States:** BA(3). **Habitats:** Aqua.

Enydra sessilifolia (Ruiz & Pav.) Cabrera, Cited in some papers as *Enydra rivularis* Standley, the accepted name is *Enydra sessilifolia* (Ruiz & Pav.) Cabrera. But this species is not recorded in the "Lista do Brasil", suggesting it is misaplied to caatinga plants. [Synonyms: *Enydra rivularis* Gardner] **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

Erechtites (1 species)

Erechtites hieracifolius (L.) Raf. ex DC. **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Eremanthus (1 species)

Eremanthus capitatus (Spreng.) MacLeish **Habits:** shrub(2). **Life forms:** microphanerophyte(1). **States:** PE(5). **Habitats:** Sed.

Flaveria (1 species)

Flaveria bidentis (L.) Kuntze **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(2). **Habitats:** Cryst.

Galinsoga (1 species)

Galinsoga parviflora Cav. **Habits:** herb(1). **States:** PB(1). **Habitats:** Ins.

Gamochaeta (1 species)

Gamochaeta americana (Mill.) Wedd. **States:** BA(1). **Habitats:** Aqua.

Gochnatia (2 species)

Gochnatia blanchetiana (DC.) Cabrera **Habits:** shrub(1). **States:** CE(1). **Habitats:** Sed.

Gochnatia oligocephala (Gardner) Cabrera [Synonyms: *Gochnatia lucida* (Baker) Cabrera] **Habits:** shrub(1). **Life forms:** microphanerophyte(1); phanerophyte(1). **States:** BA(2); PE(5). **Habitats:** Ins, Sed.

Helichrysum (1 species)

Helichrysum indicum (L.) Grierson **Life forms:** therophyte(2). **States:** PE(2). **Habitats:** Ins.

Isocarpha (1 species)

Isocarpha megacephala Mattf. **Habits:** herb(1). **States:** CE(1). **Habitats:** Trans.

Jaegeria (1 species)

Jaegeria hirta (Lag.) Less. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Lagascea (1 species)

Lagascea mollis Cav. **Habits:** herb(3); shrub(1). **Life forms:** therophyte(3). **States:** CE(1); PE(3). **Habitats:** Cryst, Trans.

Lepidaploa (6 species)

Lepidaploa arenaria (Mart. ex DC.) H.Rob. [Synonyms: *Vernonia arenaria* Mart. ex DC.] **Habits:** subshrub(1). **Life forms:** phanerophyte(1); therophyte(1). **States:** CE(1); PE(1). **Habitats:** Ins, Sed.

Lepidaploa chalybaea (Mart. ex DC.) H.Rob. [Synonyms: *Vernonia chalybaea* Mart. ex DC.] **Habits:** herb(3); shrub(2); subshrub(1). **States:** CE(1); PB(1); PE(6). **Habitats:** Ins, Riv, Sed, Trans.

Lepidaploa cotoneaster (Willd. ex Spreng.) H.Rob. [Synonyms: *Vernonia cotoneaster* (Willd. ex Spreng.) Less.] **States:** PE(1). **Habitats:** Ins.

Lepidaploa grisea (Baker) H.Rob. [Synonyms: *Vernonia grisea* Backer] **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Ins.

Lepidaploa lilacina (Mart. ex DC.) H.Rob. [Synonyms: *Vernonia lilacina* Mart. ex DC.] **Habits:** subshrub(1). **States:** BA(1). **Habitats:** Sed.

Lepidaploa remotiflora (Rich.) H.Rob. [Synonyms: *Vernonia remotiflora* Rich.] **Habits:** herb(1). **States:** PI(1). **Habitats:** Trans.

Lessingianthus (2 species)

Lessingianthus obscurus (Less.) H.Rob. [Synonyms: *Vernonia obscura* Less.] **Habits:** shrub(2). **Life forms:** phanerophyte(1). **States:** CE(2). **Habitats:** Sed.

Lessingianthus rugulosus (Sch.Bip.) H.Rob. [Synonyms: *Vernonia rugulosa* Sch.Bip.] **States:** CE(1). **Habitats:** Sed.

Lourteigia (1 species)

Lourteigia ballotifolia (Kunth) R.M.King & H.Rob. [Synonyms: *Eupatorium ballotifolium* Kunth, Some Caatinga floristic works cite the species *Eupatorium ballotifolium* Kunth for which the correct name is now *Lourteigia ballotifolia* (Kunth) R.M.King & H.Rob. However, this species does not occur in Brazil and the name has probably been misapplied to specimens of *Conocliniopsis prasiifolia* (DC.) R.M.King & H.Rob. (D.J.N.Hind pers. comm.)] **States:** BA(1). **Habitats:** Sed.

Mattfeldanthus (1 species)

Mattfeldanthus andrade-limae (G.M.Barroso) Dematt. [Synonyms: *Vernonia andrade-limae* G.M.Barroso] **Habits:** herb(1). **States:** CE(1). **Habitats:** Trans.

Melanthera (1 species)

Melanthera latifolia (Gardner) Cabrera **Habits:** herb(2). **Life forms:** therophyte(2). **States:** CE(2); PE(2). **Habitats:** Agre, Aqua, Cryst, Sed.

Pectis (3 species)

Pectis congesta (Gardner) Sch.Bip. **States:** PE(1). **Habitats:** Cryst.

Pectis linifolia L. **Habits:** herb(1). **States:** PB(1). **Habitats:** Ins.

Pectis oligocephala (Gardner) Sch.Bip. **States:** PB(1). **Habitats:** Cryst.

Pithecoseris (1 species)

Pithecoseris pacourinoides Mart. ex DC. **Habits:** herb(2). **Life forms:** hemicryptophyte(1); therophyte(3). **States:** CE(2); PB(2); PE(3); PI(1). **Habitats:** Ins, Sed.

Platypodanthera (1 species)

Platypodanthera melissifolia (DC.) R.M.King & H.Rob. **Habits:** herb(1). **Life forms:** therophyte(2). **States:** PE(4). **Habitats:** Ins, Sed.

Porophyllum (1 species)

Porophyllum ruderale (Jacq.) Cass. **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Sonchus (1 species)

Sonchus oleraceus L. **States:** BA(1). **Habitats:** Aqua.

Tilesia (1 species)

Tilesia baccata (L.f.) Pruski [Synonyms: *Wulffia baccata* (L.) Kuntze; *Wulffia stenoglossa* (DC.) Huber] **Habits:** shrub(1); subshrub(1). **States:** CE(1); PB(1); PE(1). **Habitats:** Agre, Sed.

Trichogonia (1 species)

Trichogonia menthifolia Gardner **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Trichogoniopsis (1 species)

Trichogoniopsis podocarpa (DC.) R.M.King & H.Rob. [Synonyms: *Trichogonia podocarpa* Sch.Bip. ex Baker] **Habits:** herb(1). **States:** CE(1). **Habitats:** Sed.

Tridax (1 species)

Tridax procumbens L. **Habits:** herb(8). **Life forms:** therophyte(6). **States:** CE(2); PB(2); PE(6). **Habitats:** Cryst, Ins, Riv, Sed, Trans.

Trixis (1 species)

Trixis vauthieri DC. **States:** BA(3). **Habitats:** Ins.

Unxia (1 species)

Unxia camphorata L.f. [Synonyms: *Melampodium camphoratum* (L.f.) Baker] **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Verbesina (1 species)

Verbesina macrophylla (Cass.) S.F.Blake **Habits:** shrub(1). **States:** PE(1). **Habitats:** Agre.

Wedelia (3 species)

Wedelia alagoensis Baker **Habits:** shrub(1); subshrub(1). **States:** BA(1); PE(2). **Habitats:** Aqua, Sed.

Wedelia hookeriana Gardner **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Wedelia villosa Gardner **Habits:** shrub(3); subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(6). **Habitats:** Sed, Trans.

BALANOPHORACEAE (1 genus; 1 species)

Langsdorffia (1 species)

Langsdorffia hypogaea Mart. **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

BEGONIACEAE (1 genus; 5 species)

Begonia (5 species)

Begonia fischeri Schrank **States:** BA(1). **Habitats:** Aqua.

Begonia larorum L.B.Sm. & Wassh. **States:** BA(1). **Habitats:** Ins.

Begonia lealii Brade **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Begonia reniformis Dryand. [Synonyms: *Begonia vitifolia* Schott] **Habits:** shrub(1). **States:** PE(2). **Habitats:** Agre.

Begonia saxicola A.DC. [Synonyms: *Begonia egleri* Brade] **Habits:** herb(1); rupicolous(1). **Life forms:** phanerophyte(2). **States:** PB(1); PE(4). **Habitats:** Agre, Ins.

BIGNONIACEAE (17 genera; 52 species)

Adenocalymma (4 species)

Adenocalymma axillare (K.Schum.) L.G.Lohmann [Synonyms: *Memora axillaris* K.Schum.] **Habits:** shrub(1). **States:** PI(2). **Habitats:** Sed, Trans.

Adenocalymma comosum (Cham.) DC. **Life forms:** liana(1). **States:** BA(1). **Habitats:** Ins.

Adenocalymma involucratum (Bureau & K.Schum.) L.G.Lohmann [Synonyms: *Memora involucrata* Bureau & K.Schum.] **Habits:** liana(1); shrub(1). **States:** PI(2). **Habitats:** Trans.

Adenocalymma scabriusculum Mart. ex DC. **Habits:** liana(1). **States:** PI(1). **Habitats:** Trans.

Amphilophium (1 species)

Amphilophium crucigerum (L.) L.G.Lohmann [Synonyms: *Pithecoctenium crucigerum* (L.) A.H. Gentry; *Pithecoctenium echinatum* (Jacq.) Baill.] **Habits:** climber(2); liana(1). **Life forms:** phanerophyte(2). **States:** CE(4); PE(2). **Habitats:** Agre, Ins, Sed.

Anemopaegma (4 species)

Anemopaegma acutifolium DC. **Habits:** liana(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Observations:** Citted as *Anemopaegma ataidei* A.H.Gentry, which is a nomen nudum.. **Habitats:** Sed.

Anemopaegma goyazense K.Schum. **States:** BA(1). **Habitats:** Sed.

Anemopaegma laeve DC. **Habits:** climber(4). **Life forms:** chamaephyte(1). **States:** PE(4). **Habitats:** Sed, Trans.

Anemopaegma velutinum Mart. ex DC. **Habits:** liana(1). **States:** PI(2). **Habitats:** Sed.

Bignonia (3 species)

Bignonia binata Thunb. [Synonyms: *Clytostoma binatum* (Thunb.) Sandwith; *Clytostoma binatum* (Thunb.) Sandwith] **Habits:** climber(1). **States:** PB(1); PE(1). **Habitats:** Agre, Sed.

Bignonia convolvuloides (Bureau & K.Schum.) L.G.Lohmann [Synonyms: *Clytostoma convolvuloides* Bureau & K.Schum.] **Habits:** liana(1). **States:** BA(1); CE(1). **Habitats:** Ins, Trans.

Bignonia ramentacea (Mart. ex DC.) L.G.Lohmann [Synonyms: *Clytostoma ramentaceum* (Mart. ex DC.) Bureau & K.Schum.] **Habits:** liana(1). **States:** CE(1). **Habitats:** Trans.

Cuspidaria (1 species)

Cuspidaria argentea (Wawra) Sandwith **Habits:** climber(1). **Life forms:** phanerophyte(1). **States:** PE(1); PI(1). **Habitats:** Sed.

Dolichandra (2 species)

Dolichandra quadrivalvis (Jacq.) L.G.Lohmann [Synonyms: *Melloa populifolia* (DC.) Britton; *Melloa quadrivalvis* (Jacq.) A.H.Gentry] **Habits:** liana(2); shrub(1). **States:** CE(2); PE(1); PI(1). **Habitats:** CMaior, Cryst, Riv, Trans.

Dolichandra unguis-cati (L.) L.G.Lohmann [Synonyms: *Macfadyena unguis-cati* (L.) A.H.Gentry] **Habits:** shrub(1). **States:** PB(1); RN(3). **Habitats:** Cryst, Ins, Unc.

Fridericia (13 species)

Fridericia bahiensis (Schauer ex DC.) L.G.Lohmann [Synonyms: *Arrabidaea bahiensis* (Schauer ex DC.) Sandwith & Moldenke] **Habits:** liana(1). **States:** PI(1). **Habitats:** Trans.

Fridericia caudigera (S.Moore) L.G.Lohmann [Synonyms: *Arrabidaea caudigera* (S.Moore) A.H.Gentry] **Habits:** liana(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Cryst.

Fridericia chica (Bonpl.) L.G.Lohmann [Synonyms: *Arrabidaea chica* (Bonpl.) Verl.] **Habits:** climber(2); liana(1). **Life forms:** phanerophyte(1). **States:** CE(5). **Habitats:** Sed.

Fridericia conjugata (Vell.) L.G.Lohmann [Synonyms: *Arrabidaea conjugata* (Vell.) Mart.] **States:** BA(2). **Habitats:** Ins.

Fridericia crassa (Bureau & K.Schum.) L.G.Lohmann [Synonyms: *Arrabidaea crassa* (Bureau & K.Schum.) Sprague] **Habits:** liana(1). **States:** PI(1). **Habitats:** Trans.

Fridericia dichotoma (Jacq.) L.G.Lohmann [Synonyms: *Arrabidaea corallina* (Jacq.) Sandwith] **Habits:** climber(4); liana(4). **Life forms:** phanerophyte(1). **States:** BA(1); CE(2); PE(5); PI(3). **Habitats:** CMaior, Cryst, Ins, Sed, Trans.

Fridericia dispar (Bureau ex K.Schum.) L.G.Lohmann [Synonyms: *Arrabidaea dispar* Bureau ex K.Schum.] **Habits:** climber(2); liana(5). **Life forms:** phanerophyte(1). **States:** CE(7); PI(8). **Habitats:** CMaior, Sed, Trans.

Fridericia limae (A.H.Gentry) L.G.Lohmann [Synonyms: *Arrabidaea limae* A.H.Gentry] **Habits:** climber(2); liana(1). **States:** PE(2); PI(2). **Habitats:** Sed.

Fridericia parviflora (Mart. ex DC.) L.G.Lohmann [Synonyms: *Arrabidaea parviflora* (Mart. ex DC.) Bureau & K.Schum.] **Habits:** liana(1). **States:** CE(1). **Habitats:** Trans.

Fridericia platyphylla (Cham.) L.G.Lohmann [Synonyms: *Arrabidaea brachypoda* (DC.) Bureau] **Habits:** liana(2). **States:** PI(6). **Habitats:** CMaior, Sed.

Fridericia pulchella (Cham.) L.G.Lohmann [Synonyms: *Mansoa schwackei* Bureau & K.Schum.] **Habits:** climber(1). **States:** CE(1). **Habitats:** Sed.

Fridericia subverticillata (Bureau & K.Schum.) L.G.Lohman [Synonyms: *Arrabidaea subverticillata*

Bureau & K. Schum.] **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Cryst.

Fridericia tuberculata (DC.) L.G.Lohmann [Synonyms: *Arrabidaea tuberculata* DC.] **States:** BA(1). **Habitats:** Sed.

Godmania (1 species)

Godmania dardanoi (J.C.Gomes) A.H.Gentry **Habits:** tree(2). **Life forms:** phanerophyte(1). **States:** BA(1); PI(3). **Habitats:** Sed.

Handroanthus (6 species)

Handroanthus chrysotrichus (Mart. ex DC.) Mattos [Synonyms: *Tabebuia chrysotricha* (Mart. ex DC.) Standl.] **Habits:** tree(1). **States:** MG(6); PE(1). **Habitats:** Arb, Sed.

Handroanthus heptaphyllus Mattos [Synonyms: *Tabebuia heptaphylla* (Vell.) Toledo] **Habits:** tree(1). **States:** BA(1). **Habitats:** Sed.

Handroanthus impetiginosus (Mart. ex DC.) Mattos [Synonyms: *Tabebuia impetiginosa* (Mart. ex DC.) Standl.] **Habits:** tree(10). **Life forms:** phanerophyte(4). **States:** BA(4); CE(3); MG(4); PB(4); PE(9); PI(5); RN(6). **Habitats:** Agre, Arb, CMaior, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

Handroanthus ochraceus (Cham.) Mattos [Synonyms: *Tabebuia ochracea* (Cham.) Standl.] **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(2); MG(3). **Habitats:** Arb, Sed.

Handroanthus serratifolius (Vahl) S.Grose [Synonyms: *Tabebuia serratifolia* (Vahl) G.Nicholson] **Habits:** tree(3). **Life forms:** phanerophyte(1). **States:** CE(2); PB(3); PI(6). **Habitats:** Agre, CMaior, Sed, Trans.

Handroanthus spongiosus (Rizzini) S.Grose [Synonyms: *Tabebuia spongiosa* Rizzini] **Habits:** tree(2). **States:** BA(1); MG(1); PE(3); PI(1). **Habitats:** Arb, Cryst, Diam, Riv, Trans.

Jacaranda (5 species)

Jacaranda brasiliana (Lam.) Pers. **Habits:** shrub(1); tree(1). **States:** PI(3). **Habitats:** CMaior, Trans.

Jacaranda grandifoliolata A.H.Gentry **States:** PB(1). **Habitats:** Agre.

Jacaranda jasminoides (Thunb.) Sandwith **Habits:** climber(1); shrub(5); tree(1). **Life forms:** phanerophyte(3). **States:** BA(1); CE(7); PE(2); PI(4). **Habitats:** Agre, Ins, Sed, Trans.

Jacaranda praetermissa Sandwith **Life forms:** phanerophyte(1). **States:** PI(1). **Habitats:** Sed.

Jacaranda rugosa A.H.Gentry **Habits:** shrub(1). **Life forms:** microphanerophyte(1). **States:** PE(4). **Habitats:** Ins, Sed.

Mansoa (3 species)

Mansoa angustidens (DC.) Bureau & K.Schum. **Habits:** climber(1). **States:** PE(1). **Habitats:** Trans.

Mansoa difficilis (Cham.) Bureau & K.Schum. **Habits:** climber(1). **Life forms:** liana(1). **States:** PE(1); PI(1). **Habitats:** Sed.

Mansoa hirsuta DC. **Habits:** liana(3). **Life forms:** liana(1). **States:** CE(1); PI(4). **Habitats:** Sed, Trans.

Neojobertia (1 species)

Neojobertia candolleana (Mart. ex DC.) Bureau & K.Schum. [Synonyms: *Memora candolleana* (Mart. ex DC.) Miers] **Habits:** climber(2); liana(1). **States:** CE(3); PI(1). **Habitats:** Sed, Trans, Sed.

Pyrostegia (1 species)

Pyrostegia venusta (Ker Gawl.) Miers **Habits:** climber(2). **Life forms:** phanerophyte(1). **States:** CE(1); PB(1); PE(2). **Habitats:** Agre, Ins, Sed.

Stizophyllum (1 species)

Stizophyllum perforatum (Cham.) Miers **Habits:** liana(1). **States:** PI(1). **Habitats:** CMaior.

Tabebuia (3 species)

Tabebuia aurea (Silva Manso) Benth. & Hook.f. ex S.Moore [Synonyms: *Tabebuia caraiba* (Mart.) Bureau] **Habits:** tree(1). **States:** BA(1); PB(6); PE(3); PI(1); RN(3). **Habitats:** Unc, Ins, Riv, Unc, CMaior, Cryst, Diam, Riv, Unc.

Tabebuia reticulata A.H.Gentry **States:** MG(1). **Habitats:** Arb.

Tabebuia roseoalba (Ridl.) Sandwith **States:** MG(10). **Habitats:** Arb.

Tanaecium (2 species)

Tanaecium cyrtanthum (Mart. ex DC.) Bureau & K.Schum. **Habits:** liana(1). **States:** CE(1). **Habitats:** Trans.

Tanaecium pyramidatum (Rich.) L.G.Lohmann [Synonyms: *Paragonia pyramidata* (Rich.) Bureau;

Paragonia pyramidata (Rich.) Bureau var. *pyramidata*] **States:** PB(1). **Habitats:** Agre.

Zeyheria (1 species)

Zeyheria tuberculosa (Vell.) Bureau ex Verl. **States:** MG(4). **Habitats:** Arb.

BIXACEAE (1 genus; 2 species)

Cochlospermum (2 species)

Cochlospermum regium (Mart. ex Schrank) Pilg. [Synonyms: *Cochlospermum insigne* A.St.-Hil.] **Habits:** tree(2). **States:** PB(3); PE(1); RN(1). **Habitats:** Cryst, Ins, Riv, Unc.

Cochlospermum vitifolium (Willd.) Spreng. **Habits:** tree(3); treelet(1). **Life forms:** phanerophyte(5). **States:** CE(6); PB(1); PI(4); RN(1). **Habitats:** CMaior, Cryst, Ins, Sed, Trans, Unc.

BORAGINACEAE (5 genera; 32 species)

Cordia (14 species)

Cordia alliodora (Ruiz & Pav.) Cham. **States:** PB(3). **Habitats:** Agre, Unc.

Cordia collococca L. **States:** PE(1). **Habitats:** Cryst.

Cordia discolor Cham. [Synonyms: *Cordia salzmanni* DC.] **States:** PB(1); RN(2). **Habitats:** Unc.

Cordia glazioviana (Taub.) Gottschling & J.S.Mill. [Synonyms: *Auxemma glazioviana* Taub.] **Life forms:** phanerophyte(1). **States:** CE(3); RN(4). **Habitats:** Cryst, Unc.

Cordia incognita Gottschling & J.S.Mill. [Synonyms: *Patagonula bahiensis* Moric.] **Habits:** ?(1). **States:** PI(1). **Habitats:** Trans.

Cordia insignis Cham. **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1); PB(1). **Habitats:** Cryst, Ins.

Cordia latiloba I.M.Johnst. **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** BA(2); PE(1). **Habitats:** Ins, Cryst.

Cordia magnoliifolia Cham. **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

Cordia ochnacea DC. **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Ins.

Cordia oncocalyx Allemão [Synonyms: *Auxemma oncocalyx* (Allemão) Baill.] **Habits:** tree(1). **Life forms:** phanerophyte(2). **States:** CE(5). **Habitats:** Cryst, Unc.

Cordia panicularis Rudge **Habits:** shrub(2). **States:** PI(2). **Habitats:** Trans.

Cordia rufescens A.DC. [Synonyms: *Cordia piauhiensis* Fresen.] **Habits:** shrub(8). **Life forms:** phanerophyte(3). **States:** CE(9); PE(1); PI(8). **Habitats:** CMaior, Sed, Trans.

Cordia superba Cham. **Life forms:** phanerophyte(1). **States:** BA(2). **Habitats:** Aqua, Ins.

Cordia trichotoma (Vell.) Arráb. ex Steud. **Habits:** shrub(1); tree(6). **Life forms:** phanerophyte(1). **States:** CE(4); PB(4); PE(2); PI(2). **Habitats:** Cryst, Riv, Sed, Trans, Unc.

Euploca (2 species)

Euploca procumbens (Mill.) Diane & Hilger [Synonyms: *Heliotropium procumbens* Mill.] **Habits:** herb(4). **Life forms:** therophyte(1). **States:** BA(3); PE(5). **Habitats:** Aqua, Riv, Sed, Trans.

Euploca ternata (Vahl) J.I.M.Melo & Semir [Synonyms: *Heliotropium ternatum* Vahl] **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PB(1); PE(1). **Habitats:** Cryst.

Heliotropium (4 species)

Heliotropium angiospermum Murray **Life forms:** therophyte(3). **States:** BA(1); PB(1); PE(6). **Habitats:** Agre, Aqua, Ins, Riv, Trans.

Heliotropium indicum L. **Habits:** herb(1). **States:** BA(1); PB(1); PE(3). **Habitats:** Aqua, Cryst, Sed.

Heliotropium phylicoides Cham. **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

Heliotropium transalpinum Vell. [Synonyms: *Heliotropium tiaridioides* Cham.] **Habits:** herb(1). **Life forms:** hemicryptophyte(1). **States:** PE(1); PI(1). **Habitats:** Cryst, Trans.

Tournefortia (5 species)

Tournefortia bicolor Sw. **Life forms:** phanerophyte(1). **States:** BA(1). **Habitats:** Ins.

Tournefortia paniculata Cham. **States:** PB(1). **Habitats:** Cryst.

Tournefortia rubicunda Salzm. ex A.DC. **Habits:** climber(1); shrub(2); tree(1). **Life**

forms: liana(1). **States:** PB(2); PE(5); PI(1). **Habitats:** Agre, Cryst, Ins, Riv, Sed.

Tournefortia salzmannii DC. **Habits:** climber(1); shrub(1). **States:** PB(1); PE(1). **Habitats:** Ins, Trans.

Tournefortia villosa Salzm. ex DC. **Life forms:** phanerophyte(1). **States:** BA(1); PB(1). **Habitats:** Ins.

Varronia (7 species)

Varronia curassavica Jacq. [Synonyms: *Cordia curassavica* (Jacq.) Roem. & Schult.; *Cordia verbenacea* DC.] **Habits:** shrub(2). **States:** CE(1); PE(5). **Habitats:** Ins, Riv, Sed.

Varronia dardani (Taroda) J.S.Mill. **Habits:** shrub(1). **States:** PB(1). **Habitats:** Ins.

Varronia globosa Jacq. [Synonyms: *Cordia globosa* (Jacq.) Kunth] **Habits:** shrub(5); tree(1). **Life forms:** phanerophyte(2). **States:** BA(2); CE(2); PB(8); PE(15); RN(2). **Habitats:** Agre, Cryst, Ins, Riv, Sed, Trans, Unc.

Varronia leucocephala (Moric.) J.S.Mill. [Synonyms: *Cordia leucocephala* Moric.] **Habits:** shrub(8); subshrub(2). **Life forms:** phanerophyte(1). **States:** BA(1); CE(2); PB(3); PE(17); PI(1). **Habitats:** Cryst, Ins, Riv, Sed, Trans.

Varronia leucomalloides (Taroda) J.S.Mill. [Synonyms: *Cordia leucomalloides* Taroda] **Habits:** shrub(2). **Life forms:** phanerophyte(1). **States:** CE(4). **Habitats:** Sed.

Varronia multispicata (Cham.) Borhidi [Synonyms: *Cordia bahiensis* DC.; *Cordia multispicata* Cham.] **Life forms:** phanerophyte(1). **States:** PB(2). **Habitats:** Cryst, Ins.

Varronia nivea (Fresen.) Borhidi **Habits:** shrub(1). **States:** BA(1). **Habitats:** Diam.

BRASSICACEAE (1 genus; 1 species)

Lepidium (1 species)

Lepidium bonariense L. **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

BROMELIACEAE (10 genera; 31 species)

Aechmea (3 species)

Aechmea aquilega (Salisb.) Griseb. **Life forms:** hemicryptophyte(1). **States:** BA(2). **Habitats:** Ins, Sed.

Aechmea leptantha (Harms) Leme & J.A. Siqueira [Synonyms: *Portea leptantha* Harms] **Habits:** herb(1). **Life forms:** hemicryptophyte(2). **States:** PE(4). **Habitats:** Agre, Ins.

Aechmea lingulata (L.) Baker **States:** BA(3). **Habitats:** Ins.

Billbergia (1 species)

Billbergia porteana Brong. ex Beer **Habits:** epiphyte(1). **States:** BA(3); PE(1). **Habitats:** Ins, Sed.

Bromelia (4 species)

Bromelia antiacantha Bertol. **Habits:** herb(1). **States:** BA(1). **Habitats:** Sed.

Bromelia auriculata L.B.Sm. **Habits:** herb(1). **Life forms:** chamaephyte(1). **States:** CE(2). **Habitats:** Sed.

Bromelia karatas L. [Synonyms: *Bromelia plumieri* (E.Morren) L.B. Sm.] **Habits:** herb(5). **Life forms:** chamaephyte(3); hemicryptophyte(3). **States:** CE(5); PB(1); PE(3); PI(1). **Habitats:** Agre, Cryst, Ins, Sed.

Bromelia laciniosa Mart. ex Schult. & Schult.f. **Habits:** herb(5). **Life forms:** chamaephyte(1). **States:** BA(1); CE(1); PB(5); PE(2); PI(1); RN(1). **Habitats:** Cryst, Sed, Trans, Unc.

Cryptanthus (1 species)

Cryptanthus bahianus L.B.Sm. **States:** PE(1). **Habitats:** Agre.

Dyckia (2 species)

Dyckia densiflora Schult. & Schult.f. **States:** BA(1). **Habitats:** Ins.

Dyckia limae L.B.Sm. **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

Encholirium (3 species)

Encholirium erectiflorum L.B.Sm. **Habits:** herb(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Encholirium spectabile Mart. ex Schult. & Schult.f. **Habits:** herb(4); rupicolous(1). **Life forms:** chamaephyte(4); hemicryptophyte(2). **States:** BA(2); CE(2); PB(3); PE(6); PI(1). **Habitats:** Ins, Riv, Trans.

Encholirium subsecundum (Baker) Mez **States:** BA(2). **Habitats:** Ins.

Hohenbergia (4 species)

Hohenbergia catingae Ule **Habits:** herb(1). **Life forms:** chamaephyte(1); hemicryptophyte(2). **States:** BA(2); PE(2). **Habitats:** Ins, Sed, Trans.

Hohenbergia leopoldo-horstii E.Gross **States:** BA(2). **Habitats:** Ins.

Hohenbergia ridleyi (Baker) Mez **Life forms:** hemicryptophyte(2). **States:** PE(2). **Habitats:** Ins.

Hohenbergia utriculosa Ule **States:** BA(1). **Habitats:** Sed.

Neoglaziovia (1 species)

Neoglaziovia variegata (Arruda) Mez **Habits:** epiphyte(1); herb(7); shrub(1). **Life forms:** chamaephyte(2). **States:** BA(3); PB(3); PE(10); PI(3). **Habitats:** Cryst, Ins, Sed, Trans, Unc.

Orthophytum (3 species)

Orthophytum disjunctum L.B.Sm. **Life forms:** hemicryptophyte(2). **States:** PE(3). **Habitats:** Ins.

Orthophytum glabrum (Mez) Mez **States:** BA(1). **Habitats:** Ins.

Orthophytum saxicola Ule **States:** BA(1). **Habitats:** Ins.

Tillandsia (9 species)

Tillandsia didisticha (E.Morren) Baker **States:** PE(1). **Habitats:** Ins.

Tillandsia gardneri Lindl. **Habits:** epiphyte(1). **Life forms:** phanerophyte(1). **States:** BA(2); PB(1); PE(2). **Habitats:** Ins, Sed.

Tillandsia loliacea Mart. ex Schult. & Schult.f. **Habits:** epiphyte(2); herb(1). **Life forms:** ?(1); epiphyte(1). **States:** BA(2); CE(1); PE(3); PI(1). **Habitats:** Cryst, Ins, Sed, Trans.

Tillandsia polystachia (L.) L. **States:** PE(1). **Habitats:** Ins.

Tillandsia recurvata (L.) L. **Habits:** epiphyte(5); herb(1). **Life forms:** ?(1); chamaephyte(1); epiphyte(1); phanerophyte(1). **States:** BA(4); PB(3); PE(8). **Habitats:** Cryst, Ins, Sed.

Tillandsia streptocarpa Baker **Habits:** epiphyte(3); herb(1). **Life forms:** ?(1); epiphyte(1). **States:** BA(4); CE(1); PE(4); PI(1). **Habitats:** Cryst, Ins, Sed, Trans.

Tillandsia stricta Sol. **Life forms:** phanerophyte(1). **States:** PE(2). **Habitats:** Ins.

Tillandsia tenuifolia L. **Habits:** epiphyte(1). **States:** BA(1); PE(2). **Habitats:** Ins, Sed.

Tillandsia usneoides (L.) L. **Habits:** epiphyte(1). **Life forms:** phanerophyte(1). **States:** BA(2); PE(2). **Habitats:** Ins, Sed.

BURSERACEAE (1 genus; 1 species)

Commiphora (1 species)

Commiphora leptophloeos (Mart.) J.B.Gillett [Synonyms: *Bursera leptophloeos* Mart.] **Habits:** tree(21). **Life forms:** phanerophyte(6). **States:** BA(4); CE(10); MG(8); PB(24); PE(24); PI(3); RN(16). **Habitats:** Agre, Arb, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

CABOMBACEAE (1 genus; 1 species)

Cabomba (1 species)

Cabomba aquatica Aubl. **States:** BA(1). **Habitats:** Aqua.

CACTACEAE (10 genera; 28 species)

Arrojadoa (2 species)

Arrojadoa penicillata (Gürke) Britton & Rose **Habits:** succulent(1). **States:** BA(3). **Habitats:** Ins, Sed.

Arrojadoa rhodantha (Gürke) Britton & Rose **Habits:** climber(1); shrub(1); succulent(1). **Life**

forms: chamaephyte(1). **States:** PB(2); PE(4); PI(2). **Habitats:** Cryst, Riv, Sed, Trans.

Brasiliopuntia (1 species)

Brasiliopuntia brasiliensis (Willd.) A.Berger [Synonyms: *Opuntia brasiliensis* (Willd.) Haw.] **Habits:** tree(1). **States:** PE(2). **Habitats:** Agre.

Cereus (3 species)

Cereus albicaulis (Britton & Rose) Luetzelb. [Synonyms: *Acanthocereus albicaulis* Britton & Rose] **Habits:** climber(1); shrub(3); succulent(1). **Life forms:** phanerophyte(4). **States:** BA(1); CE(1); PE(2); PI(6). **Habitats:** Ins, Sed, Trans.

Cereus jamacaru DC. **Habits:** shrub(4); succulent(2); tree(15). **Life forms:** ?(1); phanerophyte(7); succulent(1). **States:** BA(6); CE(12); MG(5); PB(21); PE(27); PI(6); RN(5). **Habitats:** Agre, Arb, CMaior, Cryst, Diam, Ins, Riv, Sed, Unc.

Cereus saddianus (Rizzini & Mattos) P.J.Braun **States:** RN(1). **Habitats:** Unc.

Epiphyllum (1 species)

Epiphyllum phyllanthus (L.) Haw. **States:** BA(1). **Habitats:** Ins.

Harrisia (1 species)

Harrisia adscendens (Gürke) Britton & Rose **Habits:** shrub(1); succulent(2). **Life forms:** ?(1). **States:** PE(6). **Habitats:** Cryst, Ins, Riv, Sed.

Melocactus (6 species)

Melocactus bahiensis (Britton & Rose) Luetzelb. **Habits:** herb(1); succulent(1). **Life forms:** chamaephyte(2). **States:** CE(1); PB(3); PE(4). **Habitats:** Cryst, Ins, Sed, Trans, Unc.

Melocactus deinacanthus Buining & Brederoo **Habits:** shrub(1). **States:** PB(1). **Habitats:** Unc.

Melocactus ernestii Vaupel **Habits:** rupicolous(1). **Life forms:** succulent(1). **States:** BA(2); PB(1). **Habitats:** Ins.

Melocactus oreas Miq. **Habits:** succulent(1). **Life forms:** ?(1). **States:** PE(4). **Habitats:** Cryst, Ins.

Melocactus salvadorensis Werderm. **States:** BA(3). **Habitats:** Ins.

Melocactus zehntneri (Britton & Rose) Luetzelb. **Habits:** herb(2). **Life forms:** chamaephyte(1). **States:** PE(1); PI(2). **Habitats:** Sed, Trans.

Pereskia (2 species)

Pereskia bahiensis Gürke **States:** MG(2). **Habitats:** Arb.

Pereskia grandifolia Haw. **States:** BA(1). **Habitats:** Diam.

Pilosocereus (8 species)

Pilosocereus catingicola (Gürke) Byles & Rowley **Habits:** shrub(1). **States:** BA(1); RN(1). **Habitats:** Diam, Unc.

Pilosocereus chrysostele (Vaupel) Byles & G.D.Rowley [Synonyms: *Cereus chrysostele* Vaupel] **Habits:** tree(1). **States:** PB(1). **Habitats:** Unc.

Pilosocereus glaucescens (Labour.) Byles & G.D.Rowley, This is a doubtful name. *Pilosocereus glaucescens* (Linke) Byles & G. D. Rowley is a name of uncertain application which should not be used (Taylor and Zappi, 2004) **States:** PB(5); PE(2). **Habitats:** Agre, Riv, Unc, Cryst.

Pilosocereus gounellei (F.A.C.Weber) Byles & Rowley **Habits:** cactus(1); rupicolous(1); shrub(5); subshrub(1); succulent(1); tree(1). **Life forms:** ?(1); phanerophyte(2). **States:** BA(4); CE(1); PB(23); PE(14); PI(4); RN(13). **Habitats:** Agre, CMaior, Cryst, Ins, Riv, Sed, Trans, Unc, Riv, Sed.

Pilosocereus pachycladus F.Ritter **Habits:** tree(1). **States:** PB(9); PE(16); PI(2). **Habitats:** Agre, Cryst, Ins, Sed, Unc, Agre, Ins, Riv, Agre, Sed.

Pilosocereus pentaedrophorus (Cels) Byles & Rowley **Habits:** shrub(1). **States:** BA(3). **Habitats:** Diam, Ins.

Pilosocereus piauhyensis (Gürke) Byles & G.D.Rowley **Habits:** cactus(1). **Life forms:** phanerophyte(3). **States:** CE(2); PB(3); PI(1); RN(2). **Habitats:** Cryst, Ins, Sed, Unc.

Pilosocereus tuberculatus (Werderm.) Byles & G.D.Rowley **Habits:** shrub(1); succulent(2); tree(1). **States:** BA(2); PE(4); PI(2). **Habitats:** Cryst, Sed.

Rhipsalis (2 species)

Rhipsalis baccifera (J.M.Muell.) Stearn **States:** PB(1). **Habitats:** Agre.

Rhipsalis lindbergiana K.Schum. **Life forms:** epiphyte(1); phanerophyte(2). **States:** BA(1); PE(2). **Habitats:** Ins.

Tacinga (2 species)

Tacinga inamoena (K.Schum.) N.P.Taylor & Stuppy [Synonyms: *Opuntia inamoena* K. Schum.] **Habits:** herb(7); shrub(1); succulent(3). **Life forms:** ?(1); chamaephyte(5). **States:** BA(2); CE(2); PB(6); PE(10); PI(2); RN(1). **Habitats:** Cryst, Ins, Riv, Sed, Trans, Unc.

Tacinga palmadora (Britton & Rose) N.P.Taylor & Stuppy [Synonyms: *Opuntia palmadora* Britton & Rose] **Habits:** cactus(1); shrub(4); succulent(2). **Life forms:** ?(1). **States:** BA(3); PB(11); PE(16). **Habitats:** Ins, Agre, Cryst, Diam, Ins, Sed, Trans, Unc.

CAMPANULACEAE (1 genus; 1 species)

Lobelia (1 species)

Lobelia xalapensis Kunth **States:** BA(1). **Habitats:** Aqua.

CANNABACEAE (2 genera; 3 species)

Celtis (2 species)

Celtis iguanaea (Jacq.) Sarg. [Synonyms: *Celtis glycycarpa* Mart. ex Miq.; *Celtis membranacea* (Wedd.) Miq.] **Habits:** tree(2). **States:** BA(2); MG(6); PE(5). **Habitats:** Arb, Ins, Riv.

Celtis pubescens (Kunth) Spreng. [Synonyms: *Celtis brasiliensis* (Gardner) Planch.] **Habits:** tree(1). **States:** MG(1); PE(1). **Habitats:** Arb, Sed.

Trema (1 species)

Trema micrantha (L.) Blume **Habits:** shrub(2); tree(1). **Life forms:** phanerophyte(4). **States:** BA(2); CE(2); PE(2); PI(1). **Habitats:** Ins, Sed, Trans.

CAPPARACEAE (9 genera; 17 species)

Cleome (5 species)

Cleome dendroides Schult. & Schult.f. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Cryst.

Cleome latifolia Vahl ex DC. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Cryst.

Cleome microcarpa Ule **Habits:** herb(2); shrub(1). **Life forms:** therophyte(1). **States:** CE(1); PE(1); PI(1). **Habitats:** Cryst, Sed, Trans.

Cleome rosea Vahl ex DC. **Habits:** herb(3). **Life forms:** therophyte(2). **States:** PE(3). **Habitats:** Trans.

Cleome siliculifera Eichler **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Cryst.

Colicodendron (1 species)

Colicodendron yco Mart. [Synonyms: *Capparis yco* (Mart.) Eichler] **Habits:** shrub(2); tree(1). **States:** BA(5); PE(4). **Habitats:** Cryst, Diam, Ins, Sed, Trans.

Crateva (1 species)

Crateva tapia L. **Habits:** tree(2). **Life forms:** phanerophyte(2). **States:** CE(1); PE(2); PI(1). **Habitats:** Cryst, Riv, Sed.

Cynophalla (2 species)

Cynophalla flexuosa (L.) J.Presl [Synonyms: *Capparis flexuosa* (L.) L.] **Habits:** shrub(6); tree(10). **Life forms:** phanerophyte(3). **States:** BA(2); CE(4); PB(20); PE(19); PI(1); RN(10). **Habitats:** Agre, Cryst, Ins, Riv, Sed, Trans, Unc.

Cynophalla hastata (Jacq.) J.Presl [Synonyms: *Capparis cynophallophora* L.; *Capparis hastata* Jacq.] **Habits:** shrub(1); tree(1). **Life forms:** phanerophyte(1). **States:** CE(1); PB(1); PE(4); PI(1). **Habitats:** Cryst, Ins, Riv, Sed, Trans, Unc.

Dactylaena (2 species)

Dactylaena micrantha Schrad. ex Schult.f. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Trans.

Dactylaena microphylla Eichler **States:** BA(1). **Habitats:** Ins.

Hemiscola (2 species)

Hemiscola aculeata (L.) Raf. [Synonyms: *Cleome aculeata* L.; *Cleome affinis* DC.] **Life**

forms: therophyte(1). **States:** BA(1); PB(1). **Habitats:** Ins, Sed.

Hemiscola diffusa (Banks ex DC.) Iltis [Synonyms: *Cleome diffusa* Banks ex DC.] **Habits:** herb(5). **Life forms:** therophyte(3). **States:** CE(1); PE(5). **Habitats:** Cryst, Ins, Sed, Trans.

Neocalyptrocalyx (1 species)

Neocalyptrocalyx longifolium (Mart.) Cornejo & Iltis [Synonyms: *Capparis jacobinae* Moric. ex Eichler] **Habits:** shrub(3); tree(7). **States:** BA(3); PB(7); PE(12). **Habitats:** Agre, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

Physostemon (2 species)

Physostemon guianense (Aubl.) Malme [Synonyms: *Cleome guianensis* Aubl.] **Habits:** herb(4). **Life forms:** therophyte(4). **States:** BA(1); PE(6); PI(1). **Habitats:** Aqua, Cryst, Sed, Trans.

Physostemon lanceolatum Mart. & Zucc. [Synonyms: *Cleome lanceolata* (Mart. & Zucc.) Iltis] **Life forms:** therophyte therophyte. **States:** PE(4). **Habitats:** Cryst, Ins.

Tarenaya (1 species)

Tarenaya spinosa (Jacq.) Raf. [Synonyms: *Cleome spinosa* Jacq.] **Habits:** shrub(2). **States:** BA(3); PB(2); PE(1); PI(1). **Habitats:** Aqua, Riv, Trans, Unc.

CARICACEAE (1 genus; 1 species)

Jacaratia (1 species)

Jacaratia corumbensis Kuntze **Habits:** shrub(1). **States:** CE(1). **Habitats:** Trans.

CARYOPHYLLACEAE (1 genus; 1 species)

Spergularia (1 species)

Spergularia marina (L.) Griseb. **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Riv.

CELASTRACEAE (4 genera; 10 species)

Fraunhofera (1 species)

Fraunhofera multiflora Mart. **States:** BA(1); MG(3); PE(1). **Habitats:** Arb, Cryst, Diam.

Hippocratea (1 species)

Hippocratea volubilis L. [Synonyms: *Hippocratea ovata* Lam.] **Life forms:** phanerophyte(1). **States:** PB(1); PE(2). **Habitats:** Agre, Ins.

Maytenus (7 species)

Maytenus acanthophylla Reissek **States:** BA(1). **Habitats:** Ins.

Maytenus boaria Molina [Synonyms: *Celastrus maytenus* Willd.] **States:** PI(1). **Habitats:** CMaior.

Maytenus catingarum Reissek **States:** PI(1). **Habitats:** Sed.

Maytenus horrida Reissek **States:** MG(1). **Habitats:** Arb.

Maytenus imbricata Reissek **Habits:** shrub(2). **Life forms:** microphanerophyte(1). **States:** BA(1); PE(4). **Habitats:** Sed.

Maytenus obtusifolia Mart. [Synonyms: *Maytenus impressa* Reissek] **Habits:** tree(1). **States:** CE(1). **Habitats:** Trans.

Maytenus rigida Mart. **Habits:** shrub(2); tree(7). **Life forms:** phanerophyte(1). **States:** BA(6); PB(12); PE(6). **Habitats:** Agre, Cryst, Diam, Ins, Riv, Sed, Unc.

Pristimera (1 species)

Pristimera sclerophylla Lombardi **Habits:** liana(1). **States:** CE(1). **Habitats:** Trans.

CHRYSOBALANACEAE (2 genera; 4 species)

Hirtella (2 species)

Hirtella ciliata Mart. & Zucc. **Habits:** shrub(1). **Life forms:** microphanerophyte(1). **States:** PE(3). **Habitats:** Sed.

Hirtella racemosa Lam. **Habits:** shrub(1). **States:** PB(1); PE(3). **Habitats:** Agre, Ins, Sed.

Licania (2 species)

Licania rigida Benth. **Habits:** tree(2). **States:** CE(1); PE(1); RN(2). **Habitats:** Riv, Trans, Unc.

Licania sclerophylla (Hook.f.) Fritsch **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Cryst.

CLUSIACEAE (1 genus; 4 species)

Clusia (4 species)

Clusia hilariana Schltdl. **States:** PB(1). **Habitats:** Agre.

Clusia melchiorii Gleason [Synonyms: *Clusia intermedia* G.Mariz] **States:** PE(1). **Habitats:** Ins.

Clusia nemorosa G.Mey. **Habits:** shrub(1). **Life forms:** microphanerophyte(1); phanerophyte(1). **States:** PB(1); PE(3). **Habitats:** Ins, Sed.

Clusia paralicola G.Mariz **Habits:** tree(1). **States:** PE(2). **Habitats:** Agre.

COMBRETACEAE (3 genera; 13 species)

Buchenavia (2 species)

Buchenavia callistachya Ducke **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Buchenavia tetraphylla (Aubl.) R.A.Howard [Synonyms: *Buchenavia capitata* (Vahl) Eichler] **Habits:** tree(4). **Life forms:** microphanerophyte(1). **States:** CE(3); PE(4); PI(4). **Habitats:** CMaior, Sed.

Combretum (9 species)

Combretum duarteanum Cambess. **Life forms:** phanerophyte. **States:** MG(5); PE(1); PI(4). **Habitats:** Arb, CMaior.

Combretum glaucocarpum Mart. [Synonyms: *Thiloa glaucocarpa* (Mart.) Eichler] **Habits:** shrub(1); tree(5). **Life forms:** phanerophyte(2). **States:** BA(1); CE(7); PB(2); PE(3); PI(2). **Habitats:** Agre, Cryst, Diam, Sed, Trans.

Combretum hilarianum D.Dietr. **Habits:** climber(4). **States:** PB(3); PE(4). **Habitats:** Cryst, Sed, Trans.

Combretum lanceolatum Pohl ex Eichler **Habits:** liana(1); shrub(2). **Life forms:** phanerophyte(1). **States:** CE(2); PI(3). **Habitats:** CMaior, Sed, Trans.

Combretum laxum Jacq. **Habits:** shrub(2). **States:** PB(2). **Habitats:** Riv.

Combretum leprosum Mart. **Habits:** shrub(11). **Life forms:** phanerophyte(5). **States:** CE(11); MG(6); PB(15); PE(1); PI(7); RN(24). **Habitats:** Arb, CMaior, Cryst, Ins, Riv, Sed, Unc.

Combretum mellifluum Eichler **Habits:** shrub(2). **Life forms:** phanerophyte(2). **States:** CE(1); PI(5). **Habitats:** CMaior, Sed.

Combretum monetaria Mart. **States:** PE(2). **Habitats:** Cryst.

Combretum pisonioides Taub. **Habits:** tree(5). **States:** BA(1); PB(9); PE(1). **Habitats:** Agre, Diam, Riv, Trans.

Terminalia (2 species)

Terminalia actinophylla Mart. **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** PI(4). **Habitats:** CMaior, Sed.

Terminalia fagifolia Mart. [Synonyms: *Terminalia fagifolia* var. *parvifolia* Eichler] **States:** BA(1); MG(2); PI(1). **Habitats:** Arb, CMaior, Diam.

COMMELINACEAE (6 genera; 12 species)

Aneilema (1 species)

Aneilema brasiliense C.B.Clarke **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Callisia (2 species)

Callisia filiformis (M.Martens & Galeotti) D.R.Hunt **Habits:** herb(2). **Life forms:** therophyte(5). **States:** BA(3); CE(3); PB(1); PE(2). **Habitats:** Aqua, Cryst, Ins, Cryst.

Callisia repens L. **Habits:** herb(2). **Life forms:** therophyte(4). **States:** PB(1); PE(4). **Habitats:** Ins, Trans.

Commelina (5 species)

Commelina benghalensis L. **Life forms:** therophyte(1). **States:** PB(1). **Habitats:** Ins.

Commelina diffusa Burm.f. **Life forms:** therophyte(1). **States:** PB(1). **Habitats:** Ins.

Commelina erecta L. **Habits:** herb(1). **States:** BA(5); PB(1); PE(2). **Habitats:** Ins, Aqua, Cryst, Ins, Sed.

Commelina obliqua Vahl **Habits:** herb(7). **Life forms:** hemicryptophyte(1); therophyte(5). **States:** PB(1); PE(13). **Habitats:** Agre, Cryst, Ins, Trans.

Commelina virginica L., *Commelina virginica* is endemic to North America and does not occur in Brazil. The name has been misapplied to Caatinga specimens which probably represent *Commelina erecta* L., a common species in Brazil, although there are also other species with which it might be confused (M. Pelligrini, pers. comm.) **Life forms:** hemicryptophyte(1). **States:** CE(1). **Habitats:** Cryst.

Dichorisandra (2 species)

Dichorisandra hexandra (Aubl.) Kuntze ex Hand.-Mazz. **Habits:** herb(3). **Life forms:** chamaephyte(1); therophyte(1). **States:** CE(2); PB(2); PE(2). **Habitats:** Agre, Ins, Sed.

Dichorisandra penduliflora Kunth **States:** BA(2). **Habitats:** Ins.

Murdannia (1 species)

Murdannia nudiflora (L.) Brenan [Synonyms: *Commelina nudiflora* L.] **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1); PB(1). **Habitats:** Cryst.

Tradescantia (1 species)

Tradescantia ambigua Mart. **Habits:** herb(1). **Life forms:** hemicryptophyte(1). **States:** PB(2). **Habitats:** Ins.

CONNARACEAE (1 genus; 1 species)

Rourea (1 species)

Rourea martiana Baker **States:** BA(2). **Habitats:** Ins.

CONVOLVULACEAE (7 genera; 66 species)

Aniseia (1 species)

Aniseia martinicensis var. ***ambigua*** Hallier f. [Synonyms: *Aniseia nitens* Choisy ex Meisn.] **States:** BA(1). **Habitats:** Sed.

Evolvulus (16 species)

Evolvulus anagalloides Meisn. **Habits:** subshrub(1). **States:** BA(1). **Habitats:** Sed.

Evolvulus barbatus Meisn. **Habits:** climber(1). **States:** PE(1). **Habitats:** Trans.

Evolvulus cressoides Mart. **States:** PB(1). **Habitats:** Cryst.

Evolvulus elaeagnifolius Dammer **Habits:** liana(2). **Life forms:** chamaephyte(2). **States:** CE(2). **Habitats:** Sed.

Evolvulus elegans Moric. **Habits:** herb(1). **States:** BA(1); PE(1). **Habitats:** Sed.

Evolvulus ericaefolius Mart. ex Schrank **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Evolvulus filipes Mart. [Synonyms: *Evolvulus exilis* Meisn.] **Habits:** climber(1); herb(2). **Life forms:** therophyte(3). **States:** BA(1); CE(3); PB(1); PE(3); RN(1). **Habitats:** Agre, Aqua, Cryst, Ins, Sed, Trans.

Evolvulus frankenioides Moric. **Habits:** herb(2); subshrub(2). **Life forms:** chamaephyte(2). **States:** PE(4). **Habitats:** Sed, Trans.

Evolvulus glomeratus Nees & Mart. **States:** BA(2). **Habitats:** Ins, Sed.

Evolvulus gypsophiloides Moric. [Synonyms: *Evolvulus gypsophiloides* var. *brevifolius* Meisn.] **States:** PB(1). **Habitats:** Cryst.

Evolvulus latifolius Ker Gawl. **Habits:** herb(1). **Life forms:** hemicryptophyte(1). **States:** CE(1); PB(1). **Habitats:** Agre, Sed.

Evolvulus macroblepharis Mart. **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Evolvulus ovatus Fernald **Habits:** herb(2). **Life forms:** therophyte(3). **States:** CE(3); RN(2). **Habitats:** Cryst, Sed, Unc.

Evolvulus phyllanthoides Moric. **Habits:** herb(1). **States:** CE(1). **Habitats:** Sed.

Evolvulus pterocaulon Moric. **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** BA(1); CE(1). **Habitats:** Sed.

Evolvulus sericeus Sw. **Habits:** climber(1). **States:** BA(1); PE(1). **Habitats:** Sed.

Ipomoea (28 species)

Ipomoea alba L. **States:** PE(1). **Habitats:** Ins.

Ipomoea aristolochiifolia G.Don **Habits:** climber(1). **Life forms:** cryptophyte-geo(1). **States:** PE(2). **Habitats:** Agre, Trans.

Ipomoea asarifolia (Desr.) Roem. & Schult. **Habits:** climber(1); herb(2); subshrub(1). **Life forms:** chamaephyte(1). **States:** BA(3); CE(1); PB(1); PE(2); PI(1). **Habitats:** Agre, Aqua, Riv, Sed.

Ipomoea bahiensis Willd. ex Roem. & Schult. **Habits:** liana(2). **Life forms:** chamaephyte(2). **States:** CE(3); PE(1); RN(2). **Habitats:** Cryst, Ins, Sed, Trans, Unc.

Ipomoea batatoides Choisy **States:** BA(2). **Habitats:** Aqua.

Ipomoea brasiliana (Choisy) Meisn. **Habits:** climber(7); liana(3). **Life forms:** cryptophyte-geo(2); liana(1); phanerophyte(1). **States:** CE(5); PB(1); PE(6); PI(3). **Habitats:** Agre, Ins, Sed, Trans.

Ipomoea carnea Jacq. **Habits:** shrub(1). **States:** BA(3); PE(1). **Habitats:** Aqua, Riv.

Ipomoea hederifolia L. **Habits:** liana(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Cryst.

Ipomoea indica (Burm.f.) Merr. [Synonyms: *Ipomoea acuminata* (Vahl) Roem. & Schult.] **States:** PE(1). **Habitats:** Ins.

Ipomoea marcellia Meisn. **Habits:** climber(2). **States:** PB(1); PE(1). **Habitats:** Ins, Trans.

Ipomoea megapotamica Choisy **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Ipomoea nil (L.) Roth **Habits:** climber(3); liana(2). **Life forms:** therophyte(2). **States:** BA(1); CE(2); PB(1); PE(3). **Habitats:** Cryst, Ins, Sed, Trans.

Ipomoea pes-caprae (L.) R.Br. **Habits:** climber(1). **States:** PB(1). **Habitats:** Ins.

Ipomoea phyllomega (Vell.) House **Habits:** climber(1). **States:** PB(1). **Habitats:** Ins.

Ipomoea polyrhizos (Silva Manso) Choisy **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Observations: According to specialist R.S.Bianchini, this name is based only on a drawing and is of doubtful validity.

Ipomoea procurrens Meisn. **Habits:** climber(1). **States:** PB(1). **Habitats:** Ins.

Ipomoea purpurea (L.) Roth **States:** PE(1). **Habitats:** Ins.

Ipomoea rosea Choisy **Habits:** climber(3); liana(2). **Life forms:** chamaephyte(5). **States:** CE(4); PE(4). **Habitats:** Cryst, Ins, Sed, Trans.

Ipomoea sericophylla Meisn. **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Cryst.

Ipomoea setifera Poir. **Habits:** vine(1). **States:** BA(1). **Habitats:** Sed.

Ipomoea setosa Ker Gawl. **States:** BA(1). **Habitats:** Aqua.

Ipomoea subincana (Choisy) Meisn. **Habits:** climber(2); liana(2). **Life forms:** chamaephyte(1); cryptophyte-geo(1). **States:** CE(2); PE(4). **Habitats:** Ins, Sed, Trans.

Ipomoea subrevoluta Choisy **States:** BA(2). **Habitats:** Aqua.

Ipomoea trifida (Kunth) G.Don **Habits:** climber(1). **States:** PE(1). **Habitats:** Agre.

Observations: According to specialist R.S.Bianchini this species is not recorded for Brazil (though it may have been introduced as an ornamental). This record is most likely the result of a misidentification.

Ipomoea triloba L. **Habits:** climber(1). **States:** PE(1). **Habitats:** Trans.

Ipomoea verbasciformis (Meisn.) O'Donell **Habits:** liana(1). **States:** CE(1). **Habitats:** Trans.

Ipomoea verbascoidea Choisy **Habits:** climber(1). **States:** PE(1). **Habitats:** Sed.

Observations: According to specialist R.S.Bianchini this species is an African species not recorded for Brazil. This record is most likely the result of a misidentification.

Ipomoea wrightii A.Gray **States:** BA(1). **Habitats:** Aqua.

Jacquemontia (13 species)

Jacquemontia bahiensis O'Donell **Habits:** climber(1). **States:** BA(2); PE(1). **Habitats:** Sed.

Jacquemontia cearensis Huber **Habits:** climber(1). **States:** PE(1). **Habitats:** Sed.

Jacquemontia densiflora (Meisn.) Hallier f. **Habits:** liana(1). **States:** PB(1); PE(2); PI(1). **Habitats:** Aqua, Cryst, Ins, Trans.

Jacquemontia evolvuloides (Moric.) Meisn. **Habits:** climber(2). **States:** PB(1); PE(2); RN(3). **Habitats:** Cryst, Ins, Sed, Unc.

Jacquemontia ferruginea Choisy **States:** BA(1). **Habitats:** Ins.

Jacquemontia glaucescens Choisy **Habits:** climber(1). **States:** PE(1). **Habitats:** Trans.

Jacquemontia gracillima (Choisy) Hallier f. [Synonyms: *Aniseia gracillima* Choisy] **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1); RN(1). **Habitats:** Cryst.

Jacquemontia heterantha (Nees & Mart.) Hallier f. [Synonyms: *Aniseia heterantha* Choisy] **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Jacquemontia multiflora (Choisy) Hallier f. **Habits:** climber(1). **States:** PB(1). **Habitats:** Ins.

Jacquemontia nodiflora (Desv.) G.Don [Synonyms: *Jacquemontia confusa* Meisn.] **Habits:** climber(3); liana(1). **Life forms:** chamaephyte(1). **States:** BA(1); CE(1); PE(3). **Habitats:** Sed, Trans.

Jacquemontia pentantha (Jacq.) G.Don **Habits:** liana(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Jacquemontia sphaerostigma (Cav.) Rusby [Synonyms: *Jacquemontia hirsuta* Choisy] **States:** PE(1). **Habitats:** Agre.

Jacquemontia velutina Choisy **Habits:** liana(1). **Life forms:** hemicryptophyte(1). **States:** CE(2). **Habitats:** Cryst, Trans.

Merremia (5 species)

Merremia aegyptia (L.) Urb. **Habits:** climber(4); liana(1). **Life forms:** therophyte(3). **States:** CE(1); PB(1); PE(5); RN(2). **Habitats:** Agre, Cryst, Ins, Trans, Unc.

Merremia cissoides (Lam.) Hallier f. **States:** PE(1). **Habitats:** Ins.

Merremia dissecta (Jacq.) Hallier f. **States:** PE(1). **Habitats:** Ins.

Merremia macrocalyx (Ruiz & Pav.) O'Donell **Habits:** climber(1). **Life forms:** cryptophyte-geo(2). **States:** PB(1); PE(3). **Habitats:** Ins, Unc.

Merremia umbellata (L.) Hallier f. **States:** BA(1). **Habitats:** Aqua.

Operculina (2 species)

Operculina alata (Ham.) Urb. **Habits:** liana(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Cryst.

Operculina macrocarpa (L.) Urb. **States:** PE(1). **Habitats:** Ins.

Turbina (1 species)

Turbina cordata (Choisy) D.F.Austin & Staples [Synonyms: *Ipomoea martii* Meisn.] **Habits:** climber(1). **States:** BA(1); CE(2); PI(1). **Habitats:** Sed.

COSTACEAE (1 genus; 1 species)

Costus (1 species)

Costus spiralis (Jacq.) Roscoe **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

CUCURBITACEAE (4 genera; 4 species)

Apodanthera (1 species)

Apodanthera glaziovii Cogn. **States:** PE(1). **Habitats:** Agre.

Cayaponia (1 species)

Cayaponia racemosa (Mill.) Cogn. **Life forms:** chamaephyte(1). **States:** CE(3). **Habitats:** Cryst, Sed, Ins.

Ceratosanthes (1 species)

Ceratosanthes trifoliata Cogn. **Habits:** climber(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Trans.

Cyclanthera (1 species)

Cyclanthera elegans Cogn. **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

CYPERACEAE (12 genera; 52 species)

Bulbostylis (3 species)

Bulbostylis capillaris (L.) C.B.Clarke **Habits:** herb(2). **Life forms:** therophyte(2). **States:** BA(1); PE(2). **Habitats:** Ins, Trans.

Bulbostylis hirtella (Schrad.) Urb. **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Ins.

Bulbostylis scabra (J.Presl & C.Presl) C.B.Clarke **Life forms:** therophyte(2). **States:** PE(4). **Habitats:** Ins.

Cyperus (20 species)

Cyperus aggregatus (Willd.) Endl. [Synonyms: *Cyperus cayennensis* Willd. ex Link; *Cyperus retrorsus* Chapm.] **Habits:** herb(1). **Life forms:** hemicryptophyte(1). **States:** BA(2); CE(2); PE(1). **Habitats:** Aqua, Ins, Sed.

Cyperus alternifolius L. [Synonyms: *Cyperus alternifolius* subsp. *flabelliformis* Kük.] **States:** PE(1). **Habitats:** Ins.

Cyperus berroi (C.B.Clarke) Barros **States:** PE(1). **Habitats:** Ins.

Cyperus compressus L. **States:** PE(1). **Habitats:** Aqua.

Cyperus cuspidatus Kunth **Habits:** herb(2). **Life forms:** cryptophyte-geo(2); therophyte(2). **States:** PE(6). **Habitats:** Cryst, Ins.

Cyperus distans L. **States:** PE(1). **Habitats:** Aqua.

Cyperus eragrostis Lam. **States:** PE(1). **Habitats:** Ins.

Cyperus esculentus L. **States:** BA(2). **Habitats:** Aqua.

Cyperus haspan L. **States:** BA(3). **Habitats:** Aqua.

Cyperus hermaphroditus (Jacq.) Standl. **States:** BA(1). **Habitats:** Aqua.

Cyperus iria L. **States:** BA(1). **Habitats:** Aqua.

Cyperus laxus Lam. [Synonyms: *Cyperus diffusus* Vahl] **Habits:** herb(3). **Life forms:** hemicryptophyte(1); therophyte(1). **States:** BA(1); CE(2); PE(2). **Habitats:** Ins, Sed, Trans.

Cyperus luzulae (L.) Retz. **Life forms:** therophyte(1). **States:** PB(1). **Habitats:** Ins.

Cyperus odoratus L. [Synonyms: *Cyperus ferax* Rich.] **Life forms:** therophyte(1). **States:** BA(8); PB(1); PE(2). **Habitats:** Aqua, Ins.

Cyperus reflexus Vahl **Habits:** herb(1). **States:** BA(1). **Habitats:** Sed.

Cyperus rotundus L. **States:** PE(1). **Habitats:** Ins.

Cyperus schomburgkianus Nees **Life forms:** therophyte(2). **States:** CE(1); PB(1); PE(1). **Habitats:** Ins.

Cyperus surinamensis Rottb. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** BA(5); CE(1); PE(1). **Habitats:** Aqua, Cryst, Ins.

Cyperus uncinulatus Schrad. ex Nees **Habits:** herb(4). **Life forms:** therophyte(6). **States:** BA(1); CE(3); PB(1); PE(9). **Habitats:** Agre, Cryst, Ins, Trans, Unc.

Cyperus virens Michx. **States:** BA(2). **Habitats:** Aqua.

Eleocharis (4 species)

Eleocharis flavescens (Poir.) Urb. **States:** PE(1). **Habitats:** Ins.

Eleocharis interstincta (Vahl) Roem. & Schult. **States:** BA(1); PE(1). **Habitats:** Aqua, Ins.

Eleocharis minima Kunth **States:** BA(2). **Habitats:** Aqua.

Eleocharis montana (Kunth) Roem. & Schult. [Synonyms: *Eleocharis nodulosa* (Roth) Schult.] **States:** BA(3). **Habitats:** Aqua.

Fimbristylis (2 species)

Fimbristylis dichotoma (L.) Vahl [Synonyms: *Fimbristylis diphylla* (Retz.) Vahl] **States:** BA(2); PE(1). **Habitats:** Aqua, Ins.

Fimbristylis dipsacea (Rottb.) C.B.Clarke **Life forms:** therophyte(1). **States:** PB(1). **Habitats:** Ins.

Fuirena (1 species)

Fuirena umbellata Rottb. **States:** PE(1). **Habitats:** Ins.

Kyllinga (3 species)

Kyllinga brevifolia Rottb. **States:** PE(1). **Habitats:** Ins.

Kyllinga odorata Vahl **States:** PE(1). **Habitats:** Ins.

Kyllinga squamulata Thonn. ex Vahl **States:** PE(1). **Habitats:** Ins.

Lipocarpha (2 species)

Lipocarpha micrantha (Vahl) G.C.Tucker **Life forms:** therophyte(1). **States:** PE(3). **Habitats:** Ins.

Lipocarpha salzmanniana Steud. **States:** PE(1). **Habitats:** Ins.

Oxycaryum (1 species)

Oxycaryum cubense (Poepp. & Kunth) Lye **States:** BA(8). **Habitats:** Aqua.

Pycreus (7 species)

Pycreus capillifolius (A.Rich.) C.B.Clarke **States:** PE(2). **Habitats:** Ins.

Pycreus flavescens (L.) Rchb. **States:** PE(1). **Habitats:** Ins.

Pycreus lanceolatus (Poir.) C.B.Clarke [Synonyms: *Cyperus lanceolatus* Poir.; *Pycreus propinquus* Nees] **States:** BA(1). **Habitats:** Aqua.

Pycreus macrostachyos (Lam.) J.Raynal **States:** BA(1). **Habitats:** Aqua.

Pycreus pelophilus (Ridl.) C.B.Clarke **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Trans.

Pycreus piceus Liebm. **States:** PE(1). **Habitats:** Ins.

Pycreus polystachyos (Rottb.) P.Beauv. [Synonyms: *Cyperus polystachyos* Rottb.] **States:** BA(1); PE(1). **Habitats:** Aqua, Ins.

Rhynchospora (5 species)

Rhynchospora barbata (Vahl) Kunth **Life forms:** therophyte(1). **States:** PB(1). **Habitats:** Ins.

Rhynchospora cephalotes (L.) Vahl **States:** PE(1). **Habitats:** Ins.

Rhynchospora contracta (Nees) J.Raynal **Life forms:** therophyte(1). **States:** BA(3); PB(1); PE(2). **Habitats:** Aqua, Ins.

Rhynchospora holoschoenoides (Rich.) Herter **States:** PE(1). **Habitats:** Ins.

Rhynchospora riparia (Nees) Boeckeler **States:** PE(1). **Habitats:** Ins.

Scleria (3 species)

Scleria interrupta Rich. **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Scleria reticularis Michx. ex Willd. **States:** PE(1). **Habitats:** Ins.

Scleria secans (L.) Urb. **States:** PE(1). **Habitats:** Ins.

Trilepis (1 species)

Trilepis lhotzkiana Nees ex Arn. **States:** BA(2). **Habitats:** Ins.

DILLENIACEAE (2 genera; 2 species)

Curatella (1 species)

Curatella americana L. **Habits:** treelet(1). **States:** PI(4). **Habitats:** CMaior.

Davilla (1 species)

Davilla cearensis Huber **Habits:** liana(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

DIOSCOREACEAE (1 genus; 10 species)

Dioscorea (10 species)

Dioscorea adenantha Uline **Life forms:** cryptophyte(1). **States:** PB(1). **Habitats:** Ins.

Dioscorea coronata Hauman **Life forms:** cryptophyte-geo(1). **States:** PE(3). **Habitats:** Agre, Ins.

Dioscorea dodecaneura Vell. **Life forms:** cryptophyte-geo(1). **States:** PE(1). **Habitats:** Ins.

Dioscorea glandulosa (Griseb.) Kunth **Life forms:** chamaephyte(1). **States:** PI(1). **Habitats:** Sed.

Dioscorea hassleriana Chodat **States:** BA(1). **Habitats:** Ins.

Dioscorea leptostachya Gardner **Habits:** herb(1). **States:** PI(1). **Habitats:** Sed.

Dioscorea ovata Vell. [Synonyms: *Dioscorea adenocarpa* Mart. ex Griseb.] **Habits:** climber(3); liana(1). **Life forms:** cryptophyte-geo(1); therophyte(2). **States:** CE(1); PE(4). **Habitats:** Ins, Sed, Trans.

Dioscorea piperifolia Humb. & Bonpl. ex Willd. **States:** PE(1). **Habitats:** Ins.

Dioscorea polygonoides Humb. & Bonpl. ex Willd. **Habits:** climber(2). **States:** PE(3). **Habitats:** Agre, Sed.

Dioscorea sincorensis R.Knuth **States:** BA(1). **Habitats:** Ins.

DROSERACEAE (1 genus; 1 species)

Drosera (1 species)

Drosera montana A.St.-Hil. **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

ERIOCAULACEAE (1 genus; 4 species)

Paepalanthus (4 species)

Paepalanthus bifidus (Schrad.) Kunth **States:** PE(1). **Habitats:** Ins.

Paepalanthus lamarckii Kunth **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Paepalanthus myocephalus (Mart.) Körn. **Life forms:** therophyte(3). **States:** PB(1); PE(2). **Habitats:** Ins.

Paepalanthus parvus Ruhland **States:** PE(1). **Habitats:** Ins.

ERYTHROXYLACEAE (1 genus; 24 species)

Erythroxylum (24 species)

Erythroxylum amplifolium (Mart.) O.E.Schulz **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Erythroxylum barbatum O.E.Schulz **Habits:** shrub(3). **Life forms:** phanerophyte(2). **States:** CE(7). **Habitats:** Sed.

Erythroxylum betulaceum Mart. **Habits:** shrub(3). **States:** CE(1); MG(2); PI(3). **Habitats:** Arb, Sed, Trans.

Erythroxylum bezerrae Plowman **Habits:** shrub(2). **Life forms:** phanerophyte(2). **States:** CE(3). **Habitats:** Sed.

Erythroxylum caatingae Plowman **Habits:** shrub(5). **Life forms:** microphanerophyte(1). **States:** BA(2); CE(1); PE(4); PI(2). **Habitats:** Ins, Sed, Trans.

Erythroxylum citrifolium A.St.-Hil. **Habits:** shrub(1). **States:** CE(1). **Habitats:** Sed.

Erythroxylum deciduum A.St.-Hil. **States:** MG(3). **Habitats:** Arb.

Erythroxylum flaccidum Salzm. ex Peyr. **States:** PE(1). **Habitats:** Ins.

Erythroxylum laetevirens O.E.Schulz **Habits:** shrub(3). **Life forms:** phanerophyte(3). **States:** CE(7); PI(2). **Habitats:** Sed.

Erythroxylum ligustrinum DC. **Habits:** tree(2). **States:** BA(2). **Habitats:** Diam.

Erythroxylum loefgrenii Diogo **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

Erythroxylum maracasense Plowman **Habits:** shrub(2). **States:** PI(2). **Habitats:** Trans.

Erythroxylum nummularia Peyr. **Habits:** shrub(1). **Life forms:** microphanerophyte(1); phanerophyte(1). **States:** CE(1); PE(1). **Habitats:** Sed.

Erythroxylum ochranthum Mart. **States:** PE(1). **Habitats:** Ins.

Erythroxylum pauferrense Plowman **States:** PB(2). **Habitats:** Agre, Unc.

Erythroxylum pulchrum A.St.-Hil. **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Erythroxylum pungens O.E.Schulz **Habits:** shrub(2); tree(1). **Life forms:** phanerophyte(1). **States:** PE(7); PI(1); RN(2). **Habitats:** Cryst, Riv, Sed, Trans.

Erythroxylum revolutum Mart. **Habits:** shrub(3); subshrub(1); tree(3). **Life forms:** microphanerophyte(1); phanerophyte(2). **States:** BA(1); PB(4); PE(8). **Habitats:** Cryst, Ins, Riv, Sed.

Erythroxylum simonis Plowman **States:** PB(3). **Habitats:** Agre, Riv.

Erythroxylum stipulosum Plowman **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(2). **Habitats:** Sed.

Erythroxylum suberosum A.St.-Hil. **Life forms:** phanerophyte(1). **States:** PE(3). **Habitats:** Ins, Sed.

Erythroxylum subracemosum Turcz. **Life forms:** phanerophyte(1). **States:** PB(1); PI(1). **Habitats:** Agre, Sed.

Erythroxylum subrotundum A.St.-Hil. **Habits:** shrub(1). **States:** PE(2). **Habitats:** Agre.

Erythroxylum vacciniifolium Mart. **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(2); PE(1); PI(1). **Habitats:** Ins, Sed.

EUPHORBIACEAE (19 genera; 103 species)

Acalypha (4 species)

Acalypha brasiliensis Müll.Arg. **Life forms:** phanerophyte(2). **States:** BA(3); PE(2). **Habitats:** Ins.

Acalypha multicaulis Müll.Arg. **Habits:** herb(1); shrub(3); subshrub(2). **Life forms:** chamaephyte(1). **States:** CE(1); PB(1); PE(10). **Habitats:** Agre, Cryst, Ins, Riv, Sed.

Acalypha poiretii Spreng. **Habits:** herb(2). **Life forms:** therophyte(2). **States:** PE(2). **Habitats:** Trans.

Acalypha villosa Jacq. [Synonyms: *Acalypha subvillosa* Müll.Arg.] **Habits:** herb(1). **States:** CE(1). **Habitats:** Sed.

Astraea (2 species)

Astraea comosa (Müll.Arg.) B.W.van Ee [Synonyms: *Croton comosus* Müll.Arg.]

Habits: shrub(1). **Life forms:** phanerophyte(1). **States:** PB(1); PE(1). **Habitats:** Agre, Ins.

Astraea lobata (L.) Klotzsch [Synonyms: *Croton lobatus* L.] **Habits:** herb(5); shrub(1); subshrub(1). **Life forms:** therophyte(5). **States:** BA(1); PB(1); PE(12). **Habitats:** Cryst, Ins, Riv, Sed, Trans, Unc.

Bernardia (1 species)

Bernardia sidoides (Klotzsch) Müll.Arg. **Habits:** herb(5). **Life forms:** therophyte(5). **States:** CE(1); PE(10). **Habitats:** Agre, Cryst, Ins, Trans, Unc.

Bia (1 species)

Bia lessertiana Baill. [Synonyms: *Tragia lessertiana* (Baill.) Müll.Arg] **Habits:** liana(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Caperonia (1 species)

Caperonia palustris (L.) A.St.-Hil. **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Cnidoscolus (7 species)

Cnidoscolus bahianus (Ule) Pax & K.Hoffm. **Habits:** shrub(1); tree(1). **Life forms:** phanerophyte(1). **States:** BA(3); PE(9). **Habitats:** Cryst, Diam, Ins, Sed, Trans.

Cnidoscolus loefgrenii (Pax & K.Hoffm.) Pax & K.Hoffm. **Habits:** herb(1). **Life forms:** hemicryptophyte(1). **States:** PB(1); PE(4). **Habitats:** Cryst, Ins, Cryst, Riv.

Cnidoscolus oligandrus (Müll.Arg.) Pax **States:** MG(4); PE(1). **Habitats:** Sed, Arb.

Cnidoscolus pubescens Pohl [Synonyms: *Cnidoscolus obtusifolius* Pohl ex Baill.] **Habits:** shrub(1); subshrub(1); tree(1). **States:** MG(5); PE(4). **Habitats:** Agre, Arb, Sed.

Cnidoscolus quercifolius Pohl [Synonyms: *Cnidoscolus phyllacanthus* (Müll. Arg.) Fern.Casas] **Habits:** tree(10). **Life forms:** phanerophyte(1). **States:** BA(1); PB(7); PE(15); PI(1); RN(14). **Habitats:** Cryst, Riv, Sed, Trans, Unc.

Cnidoscolus urens (L.) Arthur **Habits:** shrub(7); subshrub(2). **Life forms:** phanerophyte(4). **States:** BA(4); CE(2); PB(4); PE(12); PI(2); RN(2). **Habitats:** Agre, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

Cnidoscolus vitifolius (Mill.) Pohl [Synonyms: *Jatropha vitifolia* Mill.] **Habits:** shrub(9). **Life forms:** phanerophyte(2). **States:** BA(1); CE(8); PE(3); PI(2). **Habitats:** Sed, Trans.

Croton (37 species)

Croton adamantinus Müll.Arg. **Habits:** shrub(2). **States:** PE(3); PI(1). **Habitats:** Ins, Sed, Trans.

Croton adenocalyx Baill. **Habits:** shrub(2). **Life forms:** phanerophyte(2). **States:** CE(2); PB(1). **Habitats:** Cryst, Riv.

Croton adenodontus (Müll.Arg) Müll.Arg **Habits:** shrub(3). **States:** PE(1); PI(2). **Habitats:** Sed, Trans.

Croton alagoensis Müll. Arg., According specialist D.S. Carneiro-Torres this is almost certainly the same species as *Croton blanchetianus* Baill. **Life forms:** phanerophyte(1). **States:** PB(1). **Habitats:** Ins.

Croton argyrophylloides Müll.Arg. **Habits:** shrub(5); tree(1). **Life forms:** phanerophyte(2). **States:** BA(1); CE(6); PB(1); PE(1); PI(2); RN(1). **Habitats:** Cryst, Diam, Sed, Trans, Unc.

Croton argyrophyllus Kunth [Synonyms: *Croton micans* Müll. Arg.] **Habits:** shrub(4). **States:** PE(7). **Habitats:** Agre, Ins, Sed.

Croton betaceus Baill. **Habits:** shrub(3). **Life forms:** phanerophyte(1). **States:** CE(4); PE(1). **Habitats:** Sed.

Croton blanchetianus Baill. **Habits:** shrub(11). **Life forms:** phanerophyte(4). **States:** CE(7); PB(5); PE(7); RN(1). **Habitats:** Agre, Cryst, Riv, Sed, Trans, Unc.

Croton campestris A.St.-Hil., *Croton campestris* is a species known to occur in the Brazilian semi-arid though the name has often been misapplied to herbarium specimens of *Croton heliotropiifolius* Kunth (D.S. Carneiro-Torres, pers. comm.) **Habits:** shrub(4). **Life forms:** phanerophyte(1). **States:** BA(1); PB(4); PE(2); PI(5); RN(5). **Habitats:** Agre, CMaior, Cryst, Ins, Riv, Trans, Unc.

Croton celtidifolius Baill. **Life forms:** phanerophyte(1). **States:** PI(1). **Habitats:** Sed.

Croton compressus Lam. **States:** PB(1). **Habitats:** Agre.

Croton cordiifolius Baill. **Habits:** shrub(2). **Life forms:** phanerophyte(2). **States:** CE(2). **Habitats:** Sed.

Croton echioides Baill. **Habits:** shrub(3). **Life forms:** phanerophyte(1). **States:** BA(2); CE(1); PB(4). **Habitats:** Cryst, Ins, Riv, Sed.

Croton gardnerianus Baill. **Habits:** shrub(1). **States:** CE(2); PE(1). **Habitats:** Ins, Sed.

Croton glandulosus L. **Habits:** herb(3); shrub(1); subshrub(1). **Life forms:** therophyte(5). **States:** CE(2); PB(1); PE(6); RN(2). **Habitats:** Cryst, Ins, Sed, Trans, Unc.

Croton glutinosus Müll.Arg. **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Croton grewioides Baill. **Habits:** herb(1); shrub(3). **Life forms:** phanerophyte(2). **States:** BA(2); CE(3); PE(3); PI(1). **Habitats:** Ins, Sed.

Croton heliotropiifolius Kunth [Synonyms: *Croton conduplicatus* Kunth; *Croton moritibensis* Baill.; *Croton rhamnifolioides* Pax & K. Hoffm.; *Croton rhamnifolius* Willd.; *Croton rhamnifolius* Willd. var. *moritibensis*] **Habits:** shrub(14); subshrub(3). **Life forms:** phanerophyte(5). **States:** BA(3); CE(7); PB(6); PE(22); RN(2). **Habitats:** Agre, Aqua, Cryst, Ins, Riv, Sed, Trans, Unc.

Croton hemiargyreus Müll.Arg. **States:** RN(15). **Habitats:** Unc.

Croton hirtus L'Hér. **Life forms:** therophyte(1). **States:** PE(5). **Habitats:** Cryst, Ins.

Croton jacobinensis Baill. **Habits:** shrub(2). **Life forms:** phanerophyte(1). **States:** CE(3); PE(2). **Habitats:** Agre, Ins, Sed.

Croton lundianus (Didr.) Müll.Arg. **Habits:** herb(2). **Life forms:** phanerophyte(1); therophyte(1). **States:** CE(2); PB(1); PI(1). **Habitats:** CMaior, Cryst, Ins.

Croton mucronifolius Müll.Arg. **States:** PE(1). **Habitats:** Cryst.

Croton muscicarpa Müll.Arg. **States:** PB(1). **Habitats:** Agre.

Croton nepetifolius Baill. **Habits:** shrub(2). **Life forms:** phanerophyte(1). **States:** CE(3); PB(2). **Habitats:** Agre, Sed, Unc.

Croton odontadenius Müll.Arg **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Observations:** Misapplied name. This species is known to occur in Southeastern Brazil and according to specialist D.S. Carneiro-Torres it is unlikely that this species occurs in the semiarid region of Brazil. **Habitats:** Sed.

Croton pedicellatus Kunth **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Croton piauhiensis Müll.Arg. **States:** PI(1). **Habitats:** Sed.

Croton pulegiodorus Baill. **Habits:** shrub(1). **States:** BA(1); CE(1). **Habitats:** Ins, Sed.

Croton pulegioides Müll.Arg. **States:** PB(1); PE(1). **Habitats:** Agre, Ins.

Croton rottlerifolius Baill. **Habits:** tree(1). **States:** PB(1). **Habitats:** Ins.

Croton rudolphianus Müll.Arg. **Habits:** shrub(2). **Life forms:** phanerophyte(2). **States:** BA(2); CE(2). **Habitats:** Ins, Sed.

Croton sincorensis Mart. **States:** CE(1). **Habitats:** Cryst.

Croton sonderianus Müll.Arg. **Habits:** shrub(10). **States:** BA(2); CE(4); PB(21); PE(11); PI(2); RN(14). **Habitats:** Agre, Cryst, Riv, Sed, Trans, Unc.

Croton tricolor Klotzsch ex Baill. **Habits:** shrub(1). **States:** CE(1). **Habitats:** Sed.

Croton urticifolius Lam. **Habits:** herb(1); shrub(3); subshrub(1). **Life forms:** phanerophyte(2); therophyte(1). **States:** CE(1); PB(3); PE(3); PI(2); RN(1). **Habitats:** Agre, Ins, Riv, Sed, Trans, Unc.

Croton zehntneri Pax & K.Hoffm. **Habits:** shrub(5). **Life forms:** phanerophyte(2). **States:** BA(1); CE(5); PE(1); PI(1). **Habitats:** Cryst, Diam, Sed, Trans.

Dalechampia (6 species)

Dalechampia affinis Müll.Arg. **Life forms:** liana(1). **States:** PI(1). **Habitats:** Sed.

Dalechampia brasiliensis Lam. **Habits:** climber(1). **Life forms:** liana(1). **States:** BA(3); PB(1). **Habitats:** Ins.

Dalechampia fernandesii G.L.Webster **Habits:** liana(1). **States:** CE(1). **Habitats:** Trans.

Dalechampia pernambucensis Baill. **Habits:** liana(2). **Life forms:** chamaephyte(1); therophyte(2). **States:** CE(4). **Habitats:** Cryst, Ins, Sed, Trans.

Dalechampia scandens L. **Habits:** climber(2); vine(1). **Life forms:** hemicryptophyte(1); therophyte(1). **States:** BA(1); PE(4). **Habitats:** Agre, Ins, Sed, Trans.

Dalechampia schenckiana Pax & K.Hoffm. **Habits:** climber(1). **States:** PE(1). **Habitats:** Sed.

Ditaxis (3 species)

Ditaxis desertorum (Müll.Arg.) Pax & K.Hoffm. **States:** BA(1). **Habitats:** Ins.

Ditaxis gardneri (Müll.Arg.) Pax & K.Hoffm. [Synonyms: *Argythamnia gardneri* Müll.Arg.] **Habits:** shrub(1). **States:** PI(1). **Habitats:** Trans.

Ditaxis malpighiacea (Ule) Pax & K.Hoffm. **Habits:** shrub(4). **States:** PB(3); PE(3). **Habitats:** Cryst, Riv, Trans.

Euphorbia (9 species)

Euphorbia bahiensis (Klotzsch & Garcke) Boiss. **Habits:** herb(1). **States:** PB(1). **Habitats:** Ins.

Euphorbia comosa Vell. **Habits:** subshrub(6). **Life forms:** chamaephyte(3); phanerophyte(2). **States:** BA(1); CE(2); PB(1); PE(6); PI(1). **Habitats:** Ins, Sed.

Euphorbia heterophylla L. [Synonyms: *Poinsettia heterophylla* (L.) Klotzsch & Garcke] **Habits:** herb(1).

Life forms: therophyte(2). **States:** CE(2). **Habitats:** Cryst.

Euphorbia hyssopifolia L. [Synonyms: *Chamaesyce hyssopifolia* (L.) Small; *Euphorbia brasiliensis* Lam.] **Habits:** herb(6). **Life forms:** hemicryptophyte(1); therophyte(5). **States:** BA(3); CE(1); PB(2); PE(9); RN(2). **Habitats:** Aqua, Cryst, Ins, Sed, Trans, Unc.

Euphorbia insulana Vell. **Habits:** herb(2). **Life forms:** phanerophyte(2); therophyte(1). **States:** CE(1); PE(5). **Habitats:** Agre, Cryst, Ins, Trans.

Euphorbia phosphorea Mart. **Habits:** shrub(1). **States:** BA(2); PB(2). **Habitats:** Ins, Riv.

Euphorbia prostrata Aiton [Synonyms: *Chamaesyce prostrata* (Aiton) Small] **States:** PB(1). **Habitats:** Cryst.

Euphorbia serpens Kunth **States:** PE(1). **Habitats:** Ins.

Euphorbia thymifolia L. [Synonyms: *Chamaesyce thymifolia* (L.) Millsp.] **Habits:** herb(2). **States:** PE(4). **Habitats:** Cryst, Ins, Sed.

Jatropha (5 species)

Jatropha curcas L. **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

Jatropha martiusii (Pohl) Baill. **Habits:** shrub(1). **States:** BA(1). **Habitats:** Diam.

Jatropha mollissima (Pohl) Baill. **Habits:** shrub(11); subshrub(1); tree(6). **Life forms:** phanerophyte(3). **States:** BA(3); CE(6); PB(20); PE(29); PI(1); RN(30). **Habitats:** Agre, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

Jatropha mollissima (Pohl) Baill. var. ***mollissima*** [Synonyms: *Jatropha pohliana* Müll. Arg.] **Habits:** shrub(1). **Life forms:** phanerophyte(2). **States:** BA(1); CE(1); PB(13); PE(1). **Habitats:** Agre, Cryst, Ins, Riv, Sed, Unc.

Jatropha mutabilis (Pohl) Baill. **Habits:** shrub(7); subshrub(1). **States:** BA(2); PB(1); PE(7); PI(2). **Habitats:** Cryst, Riv, Sed, Trans.

Jatropha ribifolia (Pohl) Baill. **Habits:** shrub(5); subshrub(1). **Life forms:** chamaephyte(1). **States:** BA(2); PB(3); PE(11). **Habitats:** Cryst, Diam, Ins, Riv, Sed, Trans.

Manihot (11 species)

Manihot anomala Pohl **Habits:** shrub(1). **Life forms:** phanerophyte(2). **States:** BA(1); CE(1); PI(1). **Habitats:** Ins, Sed.

Manihot brachyandra Pax & K.Hoffm. **Habits:** tree(1). **States:** BA(1). **Habitats:** Diam.

Manihot caerulescens Pohl **Habits:** shrub(2); tree(2). **States:** BA(1); CE(1); PI(3). **Habitats:** Sed, Trans.

Manihot carthaginensis subsp. ***glaziovii*** (Müll.Arg.) Allem [Synonyms: *Manihot glaziovii* Müll.Arg] **Habits:** shrub(2); tree(3). **States:** BA(1); CE(4); PB(9); PE(4); RN(5). **Habitats:** Agre, Cryst, Diam, Riv, Trans, Unc.

Manihot catingae Ule **Habits:** tree(3). **States:** PB(5). **Habitats:** Cryst, Riv.

Manihot dichotoma Ule **Habits:** shrub(1); tree(3); treelet(1). **States:** PE(7). **Habitats:** Agre, Sed, Trans.

Manihot epruinosa Pax & K.Hoffm. **States:** PE(2). **Habitats:** Cryst, Ins.

Manihot gabrielensis Allem **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Manihot heptaphylla Ule **Habits:** shrub(1). **States:** BA(1). **Habitats:** Sed.

Manihot palmata Müll.Arg, *Manihot palmata* is restricted to Southeastern Brazil so its use for the semi-arid of Brazil is probably a misapplication (M.L.L.Martins, pers. comm.) **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(4); PE(2). **Habitats:** Cryst, Sed.

Manihot pseudoglaziovii Pax & K.Hoffm. **Habits:** tree(2). **States:** BA(1); PB(1); PE(5). **Habitats:** Cryst, Diam.

Maprounea (1 species)

Maprounea guianensis Aubl. **Habits:** shrub(1); tree(3). **States:** CE(1); PB(2); PE(8). **Habitats:** Agre, Cryst, Riv, Trans, Unc.

Microstachys (2 species)

Microstachys corniculata (Vahl) Griseb. [Synonyms: *Sebastiania corniculata* (Vahl) Müll. Arg.] **Habits:** herb(2). **Life forms:** therophyte(2). **States:** CE(1); PE(2); RN(1). **Habitats:** Unc, Ins, Sed, Trans.

Microstachys hispida (Mart.) Govaerts **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Romanoa (1 species)

Romanoa tamnoides (A.Juss.) Radcl.-Sm. **Life forms:** chamaephyte(1). **States:** PE(1). **Habitats:** Ins.

Sapium (4 species)

Sapium argutum (Müll.Arg.) Huber [Synonyms: *Sapium sceleratum* Ridl.] **Habits:** tree(2). **Life forms:** phanerophyte(2). **States:** CE(5); PB(1); PE(2). **Habitats:** Ins, Riv, Sed.

Sapium glandulosum (L.) Morong [Synonyms: *Sapium biglandulosum* (L.) Müll.Arg.; *Sapium glandulatum*

(Vell.) Pax; *Sapium lanceolatum* (Müll. Arg.) Huber; *Sapium montevidense* Klotzsch ex Baill.]
Habits: tree(6). **Life forms:** phanerophyte(2). **States:** BA(2); CE(4); MG(4); PB(7); PE(8); RN(1). **Habitats:** Sed, Agre, Arb, Cryst, Diam, Ins, Riv, Sed, Unc.

Sapium obovatum Klotzsch ex Müll.Arg. **Life forms:** phanerophyte(1). **States:** PI(1). **Habitats:** Sed.

Sapium sellowianum (Müll.Arg.) Klotzsch ex Baill. **States:** RN(1). **Habitats:** Unc.

Sebastiania (4 species)

Sebastiania brasiliensis Spreng. **Habits:** shrub(2); tree(1). **States:** CE(3); PE(1). **Habitats:** Sed, Trans.

Sebastiania brevifolia (Müll.Arg.) Müll.Arg. **Habits:** shrub(1). **States:** CE(1). **Habitats:** Sed.

Sebastiania commersoniana (Baill.) L.B.Sm. & Downs **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Sebastiania macrocarpa Müll.Arg. **Habits:** tree(4). **Life forms:** phanerophyte(1). **States:** CE(2); PB(5). **Habitats:** Cryst, Riv.

Stillingia (2 species)

Stillingia trapezoidea Ule **Habits:** shrub(4). **Life forms:** phanerophyte(2). **States:** CE(1); PB(1); PE(2); PI(3). **Habitats:** Ins, Sed, Trans.

Stillingia uleana Pax ex K.Hoffm. **Habits:** shrub(1). **States:** CE(1). **Habitats:** Sed.

Tragia (2 species)

Tragia friesii Pax & K.Hoffm. **States:** BA(1). **Habitats:** Ins.

Tragia volubilis L. **Habits:** climber(2). **Life forms:** hemicryptophyte(1). **States:** BA(2); CE(1); PB(1); PE(3). **Habitats:** Agre, Cryst, Ins, Trans.

FABACEAE (87 genera; 292 species)

Acosmium (1 species)

Acosmium diffusissimum (Mohlenbr.) Yakovlev **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Aeschynomene (8 species)

Aeschynomene evenia C.Wright & Sauvalle **States:** BA(5). **Habitats:** Aqua.

Aeschynomene histrix Poir. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Aeschynomene marginata Benth. **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Aeschynomene martii Benth. **Habits:** shrub(2). **States:** BA(1); PE(1). **Habitats:** Sed.

Aeschynomene mollicula Kunth **Habits:** climber(1). **States:** PE(1). **Habitats:** Agre.

Aeschynomene scabra G.Don **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Ins.

Aeschynomene sensitiva Sw. **Life forms:** therophyte(1). **States:** PB(3); RN(1). **Habitats:** Ins, Riv, Unc.

Aeschynomene viscidula Michx. **Habits:** herb(1); subshrub(1). **Life forms:** chamaephyte(1). **States:** PE(2). **Habitats:** Sed, Trans.

Albizia (3 species)

Albizia inundata (Mart.) Barneby & J.W.Grimes **Habits:** tree(2). **States:** BA(1); CE(1); PB(1); PE(1). **Habitats:** Agre, Diam, Riv, Trans.

Albizia niopoides (Spruce ex Benth.) Burkart var. ***niopoides*** [Synonyms: *Albizia hassleri* (Chodat) Burkart] **States:** MG(1). **Habitats:** Arb.

Albizia polycephala (Benth.) Killip ex Record **Life forms:** phanerophyte(1). **States:** PB(1); PI(1). **Habitats:** Agre, Sed.

Amburana (1 species)

Amburana cearensis (Allemão) A.C.Sm. [Synonyms: *Torresea cearensis* Allemão]
Habits: tree(10). **Life forms:** phanerophyte(3). **States:** BA(2); CE(7); PB(9); PE(6); PI(4); RN(8). **Habitats:** Agre, CMaior, Cryst, Diam, Riv, Sed, Trans, Unc.

Anadenanthera (2 species)

Anadenanthera colubrina (Vell.) Brenan **Habits:** tree(7). **Life forms:** phanerophyte(1). **States:** BA(1); CE(4); MG(10); PB(14); PE(21); PI(2); RN(7). **Habitats:** Agre, Arb, Cryst, Ins, Riv, Trans, Unc, CMaior, Cryst, Riv, Sed, Trans, Unc.

Anadenanthera colubrina var. ***cebil*** (Griseb.) Altschul [Synonyms: *Anadenanthera macrocarpa* (Benth.) Brenan; *Piptadenia macrocarpa* Benth.]
Habits: shrub(1). **States:** BA(2); CE(1); PB(5); PE(1);

PI(1); RN(4). **Habitats:** Cryst, Diam, Riv, Sed, Trans, Unc.

Anadenanthera peregrina var. ***falcata*** (Benth.) Altschul [Synonyms: *Piptadenia falcata* Benth.] **States:** MG(1). **Habitats:** Arb.

Andira (2 species)

Andira surinamensis (Bondt) Splitg. ex Amshoff **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Andira vermifuga (Mart.) Benth. **Habits:** tree(1). **States:** PI(1). **Habitats:** Trans.

Apuleia (2 species)

Apuleia grazielana Afr.Fern. **Habits:** shrub(1). **States:** CE(1). **Habitats:** Sed.

Apuleia leiocarpa (Vogel) J.F.Macbr. **Habits:** tree(1). **States:** MG(6); PE(1). **Habitats:** Arb, Sed.

Arachis (1 species)

Arachis dardani Krapov. & W.C.Greg. **Habits:** herb(1). **Life forms:** therophyte(2). **States:** CE(2). **Habitats:** Cryst.

Bauhinia (9 species)

Bauhinia acuruana Moric. **Habits:** shrub(11). **Life forms:** nanophanerophyte(1); phanerophyte(1). **States:** BA(2); CE(7); PE(8); PI(5). **Habitats:** Ins, Sed, Trans.

Bauhinia catingae Harms **States:** PB(1). **Habitats:** Cryst.

Bauhinia cheilantha (Bong.) Steud. **Habits:** shrub(14); tree(2). **Life forms:** phanerophyte(4). **States:** CE(9); PB(18); PE(22); PI(3); RN(14). **Habitats:** Agre, Cryst, Ins, Riv, Sed, Trans, Unc.

Bauhinia dubia G.Don **Habits:** shrub(1); tree(1). **Life forms:** phanerophyte(1). **States:** CE(1); PI(3). **Habitats:** CMaior, Sed.

Bauhinia forficata Link **Habits:** liana(1); shrub(1). **States:** CE(1); MG(9); PI(1). **Habitats:** Trans, Arb.

Bauhinia pentandra (Bong.) Vogel ex Steud. [Synonyms: *Bauhinia heterandra* Benth.] **Habits:** shrub(5); tree(1). **Life forms:** phanerophyte(3). **States:** BA(1); CE(2); PE(5); PI(3). **Habitats:** Cryst, Ins, Riv, Sed, Trans.

Bauhinia pulchella Benth. **Habits:** shrub(3); tree(1). **Life forms:** phanerophyte(2). **States:** CE(4); PI(5). **Habitats:** CMaior, Sed, Trans.

Bauhinia subclavata Benth. **Habits:** shrub(2). **Life forms:** phanerophyte(1). **States:** CE(4); PI(2). **Habitats:** Sed.

Bauhinia ungulata L. **Habits:** shrub(2); tree(1). **Life forms:** phanerophyte(2). **States:** CE(2); PI(4). **Habitats:** CMaior, Sed.

Blanchetiodendron (1 species)

Blanchetiodendron blanchetii (Benth.) Barneby & J.W.Grimes **States:** MG(4). **Habitats:** Arb.

Bowdichia (1 species)

Bowdichia virgilioides Kunth **Habits:** tree(2). **Life forms:** phanerophyte(1). **States:** CE(1); PE(1). **Habitats:** Sed.

Calliandra (8 species)

Calliandra aeschynomenoides Benth. **Habits:** shrub(1); tree(1). **States:** PE(2). **Habitats:** Sed.

Calliandra depauperata Benth. **Habits:** shrub(2). **States:** PE(1); PI(1). **Habitats:** Trans.

Calliandra dysantha Benth. **Habits:** shrub(1). **States:** PI(1). **Habitats:** Trans.

Calliandra leptopoda Benth. **Habits:** shrub(1). **States:** PI(1). **Habitats:** Trans.

Calliandra macrocalyx Harms **Habits:** tree(1). **States:** BA(1). **Habitats:** Sed.

Calliandra parvifolia (Hook. & Arn.) Speg. [Synonyms: *Calliandra myriophylla* Benth.] **States:** MG(1). **Habitats:** Arb.

Calliandra sessilis Benth. **States:** PI(1). **Habitats:** Sed.

Calliandra umbellifera Benth. **Habits:** shrub(2); treelet(1). **States:** CE(2); PI(2). **Habitats:** Sed, Trans.

Canavalia (1 species)

Canavalia brasiliensis Mart. ex Benth. **Habits:** climber(1); liana(1). **Life forms:** chamaephyte(1); phanerophyte(1). **States:** CE(2); PB(1); PE(2). **Habitats:** Cryst, Ins, Trans.

Cassia (1 species)

Cassia ferruginea (Schrad.) Schrad. ex DC. **Habits:** shrub(1). **States:** PB(1); PI(1). **Habitats:** Agre, Trans.

Cenostigma (1 species)

Cenostigma macrophyllum Tul.
[Synonyms: *Cenostigma gardnerianum* Tul.]
Habits: tree(1). **States:** CE(4); PI(5). **Habitats:** Sed, Trans, Sed.

Centrolobium (1 species)

Centrolobium sclerophyllum H.C.Lima **States:** MG(2). **Habitats:** Arb.

Centrosema (5 species)

Centrosema brasilianum (L.) Benth. **Habits:** liana(2); vine(1). **Life forms:** chamaephyte(1); hemicryptophyte(2). **States:** BA(5); CE(2); PB(2). **Habitats:** Aqua, Cryst, Ins, Sed.

Centrosema pascuorum Mart. ex Benth. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1); RN(1). **Habitats:** Cryst.

Centrosema sagittatum (Humb. & Bonpl. ex Willd.) Brandegee **Habits:** climber(1). **States:** PB(1); PE(1). **Habitats:** Agre, Ins.

Centrosema venosum Mart. ex Benth. **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Ins.

Centrosema virginianum (L.) Benth. **Habits:** climber(2); herb(1); liana(1). **Life forms:** chamaephyte(1); therophyte(2). **States:** PE(5); PI(1). **Habitats:** Cryst, Ins, Sed, Trans.

Chaetocalyx (2 species)

Chaetocalyx longiflora Benth. ex A.Gray
[Synonyms: *Chaetocalyx hebecarpa* Benth.]
Habits: climber(1). **States:** PE(2). **Habitats:** Agre.

Chaetocalyx scandens (L.) Urb. **Habits:** climber(1). **Life forms:** hemicryptophyte(1); therophyte(1). **States:** BA(2); CE(2); PE(3). **Habitats:** Cryst, Ins, Sed, Trans.

Chamaecrista (24 species)

Chamaecrista amiciella (H.S.Irwin & Barneby) H.S.Irwin & Barn **States:** BA(1). **Habitats:** Ins.

Chamaecrista barbata (Nees & Mart.) H.S.Irwin & Barneby **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Chamaecrista belemii (H.S.Irwin & Barneby) H.S.Irwin & Barneb **Habits:** shrub(2); subshrub(1). **Life forms:** chamaephyte(1). **States:** BA(2); CE(2). **Habitats:** Sed, Trans.

Chamaecrista brevicalyx (Benth.) H.S.Irwin & Barneby **Habits:** tree(1). **States:** PI(1). **Habitats:** Trans.

Chamaecrista calycioides (DC. ex Collad.) Greene **Habits:** herb(2). **Life forms:** chamaephyte(1); hemicryptophyte(1). **States:** CE(2); PE(1). **Habitats:** Cryst, Trans.

Chamaecrista cytisoides (DC. ex Collad.) H.S.Irwin & Barneby **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

Chamaecrista desvauxii (Collad.) Killip
[Synonyms: *Cassia desvauxii* Collad.] **Habits:** shrub(2); tree(1). **States:** BA(1); PE(1); PI(2). **Habitats:** Sed, Trans.

Chamaecrista desvauxii (Collad.) Killip var. ***desvauxii*** [Synonyms: *Cassia tetraphylla* Desv.; *Cassia tetraphylla* Desv. var. *tetraphylla*] **States:** BA(1); RN(1). **Habitats:** Cryst, Sed.

Chamaecrista diphylla (L.) Greene **Habits:** herb(1). **Life forms:** hemicryptophyte(1). **States:** CE(1). **Habitats:** Sed.

Chamaecrista duckeana (P.Bezerra & Afr.Fern.) H.S.Irwin & Bar **Habits:** subshrub(2). **Life forms:** chamaephyte(3). **States:** CE(3). **Habitats:** Cryst, Sed.

Chamaecrista eitenorum (H.S.Irwin & Barneby) H.S.Irwin & Barn **Habits:** tree(2). **Life forms:** phanerophyte(1). **States:** PI(4). **Habitats:** Sed, Trans, Sed.

Chamaecrista fasciculata (Michx.) Greene
[Synonyms: *Cassia chamaecrista* L.] **States:** BA(1). **Habitats:** Sed.

Chamaecrista flexuosa (L.) Greene **Habits:** subshrub(3). **States:** BA(2); PE(3). **Habitats:** Ins, Sed.

Chamaecrista glandulosa (L.) Greene
[Synonyms: *Cassia glandulosa* L.] **States:** BA(1). **Habitats:** Sed.

Chamaecrista nictitans (L.) Moench **Habits:** subshrub(6). **Life forms:** chamaephyte(3); therophyte(2). **States:** CE(3); PB(2); PE(5). **Habitats:** Agre, Cryst, Ins, Sed.

Chamaecrista pilosa (L.) Greene **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Chamaecrista ramosa (Vogel) H.S.Irwin & Barneby **Habits:** subshrub(1). **Life forms:** chamaephyte(1); microphanerophyte(1). **States:** CE(1); PE(3). **Habitats:** Sed.

Chamaecrista repens (Vogel) H.S.Irwin & Barneby **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(1); PB(1); PE(1). **Habitats:** Cryst, Sed.

Chamaecrista rotundifolia (Pers.) Greene **Habits:** herb(3). **Life forms:** ?(1); phanerophyte(1).

States: CE(2); PB(1); PE(1). **Habitats:** Cryst, Ins, Sed, Trans.

Chamaecrista serpens (L.) Greene **Habits:** herb(1). **States:** PI(1). **Habitats:** Trans.

Chamaecrista supplex (Mart. ex Benth.) Britton & Rose ex Brit **Habits:** herb(1). **Life forms:** ?(1). **States:** CE(1). **Habitats:** Cryst.

Chamaecrista swainsonii (Benth.) H.S.Irwin & Barneby **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Chamaecrista tenuisepala (Benth.) H.S.Irwin & Barneby **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Chamaecrista trichopoda (Benth.) Britton & Rose ex Britton **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Trans.

Chamaecrista zygophylloides (Taub.) H.S.Irwin & Barneby **Habits:** shrub(1); subshrub(2). **Life forms:** chamaephyte(1). **States:** CE(1); PE(1); PI(1). **Habitats:** Sed, Trans.

Chloroleucon (5 species)

Chloroleucon acacioides (Ducke) Barneby & J.W.Grimes **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Chloroleucon dumosum (Benth.) G.P.Lewis [Synonyms: *Pithecellobium dumosum* Benth.] **Habits:** shrub(1); tree(2). **States:** BA(1); CE(1); PE(2). **Habitats:** Riv, Sed, Trans.

Chloroleucon foliolosum (Benth.) G.P.Lewis [Synonyms: *Pithecellobium foliolosum* Benth.] **Habits:** shrub(3); tree(6). **States:** CE(1); MG(4); PB(7); PE(8); RN(1). **Habitats:** Arb, Cryst, Riv, Sed, Trans.

Chloroleucon mangense (Jacq.) Britton & Rose [Synonyms: *Pithecellobium parvifolium* (Sw.) Benth.] **States:** BA(1); PE(3). **Habitats:** Cryst, Diam, Trans.

Chloroleucon tortum (Mart.) Pittier **States:** MG(6). **Habitats:** Arb.

Copaifera (3 species)

Copaifera coriacea Mart. **Habits:** tree(3). **States:** BA(2); PI(3). **Habitats:** CMaior, Sed, Trans.

Copaifera langsdorffii Desf. **Habits:** tree(1). **States:** MG(2); PI(1). **Habitats:** Arb, Trans.

Copaifera martii Hayne **Habits:** tree(3). **Life forms:** phanerophyte(2). **States:** CE(7). **Habitats:** Sed.

Cranocarpus (1 species)

Cranocarpus gracilis Afr.Fern. & P.Bezerra **Habits:** subshrub(2). **Life forms:** chamaephyte(1). **States:** CE(3). **Habitats:** Sed.

Cratylia (2 species)

Cratylia argentea (Desv.) Kuntze [Synonyms: *Cratylia floribunda* Benth.] **Habits:** climber(1); liana(1). **States:** CE(2). **Habitats:** Sed, Trans.

Cratylia mollis Mart. ex Benth. **Habits:** liana(2); shrub(6). **Life forms:** phanerophyte(1). **States:** BA(3); CE(2); PE(3); PI(5). **Habitats:** Sed, Trans.

Crotalaria (5 species)

Crotalaria bahiensis Windler & S.G.Skinner **Habits:** shrub(1); subshrub(2). **States:** PB(1); PE(2). **Habitats:** Ins, Sed.

Crotalaria holosericea Nees & Mart. **Habits:** shrub(1). **Life forms:** chamaephyte(1); phanerophyte(3). **States:** BA(2); CE(2); PB(1); PE(1); PI(1). **Habitats:** Cryst, Ins, Sed.

Crotalaria incana L. **Habits:** subshrub(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Trans.

Crotalaria lanceolata E.Mey. **Life forms:** therophyte(2). **States:** PE(3). **Habitats:** Ins.

Crotalaria vitellina Ker Gawl. [Synonyms: *Crotalaria vitellina* Ker Gawl. var. *laeta*] **Habits:** herb(1). **Life forms:** phanerophyte(1); therophyte(1). **States:** CE(2); PB(1). **Habitats:** Ins, Sed.

Dalbergia (4 species)

Dalbergia catingicola Harms **Habits:** tree(2). **States:** PE(3). **Habitats:** Sed.

Dalbergia cearensis Ducke **Habits:** shrub(1); tree(8). **Life forms:** phanerophyte(1). **States:** BA(1); CE(8); MG(4); PE(2); PI(4). **Habitats:** Arb, Diam, Sed, Trans, Unc.

Dalbergia frutescens (Vell.) Britton [Synonyms: *Dalbergia variabilis* Vogel] **Habits:** shrub(1). **States:** CE(2); PI(1). **Habitats:** Sed, Trans.

Dalbergia glaucescens (Mart. ex Benth.) Benth. **Habits:** tree(1). **States:** BA(1). **Habitats:** Diam.

Desmanthus (1 species)

Desmanthus virgatus (L.) Willd. **Habits:** shrub(2). **States:** PB(4); PE(1); PI(1). **Habitats:** Cryst, Riv, Trans, Unc.

Desmodium (5 species)

Desmodium distortum (Aubl.) J.F.Macbr. **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Desmodium glabrum (Mill.) DC. **Life forms:** hemicryptophyte(1). **States:** CE(1); PE(1). **Habitats:** Agre, Ins.

Desmodium incanum DC. **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Desmodium procumbens (Mill.) Hitchc. [Synonyms: *Desmodium spirale* (Sw.) DC.] **Habits:** herb(1). **States:** PB(1); PE(1). **Habitats:** Agre, Cryst.

Desmodium tortuosum (Sw.) DC. **States:** BA(1). **Habitats:** Aqua.

Dimorphandra (1 species)

Dimorphandra gardneriana Tul. **Habits:** tree(1). **States:** PI(1). **Habitats:** Trans.

Dioclea (5 species)

Dioclea grandiflora Mart. ex Benth. **Habits:** climber(4); liana(5). **Life forms:** liana(1); phanerophyte(2). **States:** BA(2); CE(3); PB(3); PE(3); PI(4). **Habitats:** Agre, Cryst, Ins, Sed, Trans, Unc.

Dioclea marginata Benth. **Habits:** liana(1). **States:** BA(1). **Habitats:** Sed.

Dioclea megacarpa Rolfe **Habits:** liana(1). **Life forms:** phanerophyte(1). **States:** CE(2). **Habitats:** Sed.

Dioclea sclerocarpa Ducke **Habits:** climber(1). **States:** CE(1). **Habitats:** Sed.

Dioclea violacea Mart. ex Benth. **Habits:** climber(2). **Life forms:** phanerophyte(1). **States:** CE(5); PB(1). **Habitats:** Ins, Sed.

Diplotropis (1 species)

Diplotropis ferruginea Benth. **States:** MG(2). **Habitats:** Arb.

Dipteryx (1 species)

Dipteryx odorata (Aubl.) Willd. **States:** RN(1). **Habitats:** Unc.

Diptychandra (1 species)

Diptychandra aurantiaca subsp. ***epunctata*** (Tul.) H.C.Lima et a [Synonyms: *Diptychandra epunctata* Tul.] **Habits:** tree(1). **States:** PI(1). **Habitats:** Trans.

Discolobium (1 species)

Discolobium hirtum Benth. **Habits:** shrub(1). **States:** PI(1). **Habitats:** Trans.

Enterolobium (2 species)

Enterolobium contortisiliquum (Vell.) Morong **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** MG(2); PB(2); PE(1). **Habitats:** Agre, Arb, Ins, Trans.

Enterolobium timbouva Mart. **States:** MG(1). **Habitats:** Arb.

Eriosema (1 species)

Eriosema glaziovii Harms **Habits:** subshrub(1). **States:** PB(1). **Habitats:** Unc.

Erythrina (2 species)

Erythrina velutina Willd. **Habits:** ?(1); tree(5). **Life forms:** phanerophyte(2). **States:** BA(1); CE(3); MG(1); PB(12); PE(5); RN(1). **Habitats:** Agre, Arb, Cryst, Diam, Ins, Riv, Trans, Unc.

Erythrina verna Vell. [Synonyms: *Erythrina mulungu* Mart.] **States:** MG(1). **Habitats:** Arb.

Erythrostemon (1 species)

Erythrostemon calycina (Benth.) L.P.Queiroz [Synonyms: *Caesalpinia calycina* Benth.] **Habits:** shrub(1); subshrub(1). **States:** PE(2). **Habitats:** Sed.

Galactia (4 species)

Galactia jussiaeana Kunth **Habits:** liana(3). **Life forms:** phanerophyte(2). **States:** CE(2); PI(1). **Habitats:** Sed, Trans.

Galactia remansoana Harms **Habits:** vine(1). **States:** BA(1). **Habitats:** Sed.

Galactia striata (Jacq.) Urb. **Habits:** climber(2). **Life forms:** hemicryptophyte(1). **States:** CE(1); PB(1); PE(2). **Habitats:** Cryst, Sed, Trans.

Galactia texana (Scheele) A.Gray **Life forms:** hemicryptophyte(1). **States:** PI(1). **Observations:** According the Lista de Espécies da Flora do Brasil 2012, *Galactia texana* (Scheele) A.Gray do not occurs in Brazil. This is probably a misidentified species.. **Habitats:** Sed.

Geoffroea (1 species)

Geoffroea spinosa Jacq. **Habits:** tree(3). **States:** PB(1); PE(5). **Habitats:** Riv.

Goniorrhachis (1 species)

Goniorrhachis marginata Taub. **States:** BA(2); MG(8). **Habitats:** Arb, Diam.

Harpalyce (1 species)

Harpalyce brasiliana Benth. **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Hymenaea (7 species)

Hymenaea aurea Y.T.Lee & Langenh. **Habits:** tree(2). **States:** PI(2). **Habitats:** Trans.

Hymenaea courbaril L. **Habits:** tree(8). **Life forms:** microphanerophyte(1). **States:** PB(2); PE(7); PI(6). **Habitats:** CMaior, Cryst, Riv, Sed, Trans.

Hymenaea eriogyne Benth. **Habits:** shrub(3); tree(3). **Life forms:** phanerophyte(2). **States:** BA(1); CE(8); PI(2). **Habitats:** Sed, Trans.

Hymenaea maranhensis Y.T.Lee & Langenh. **States:** PI(1). **Habitats:** CMaior.

Hymenaea martiana Hayne **Life forms:** phanerophyte(1). **States:** BA(1); PE(1). **Habitats:** Ins, Sed.

Hymenaea stigonocarpa Mart. ex Hayne **Life forms:** phanerophyte(1). **States:** MG(2); PI(2). **Habitats:** Arb, Sed, Trans.

Hymenaea velutina Ducke **Habits:** tree(4). **Life forms:** phanerophyte(2). **States:** CE(7). **Habitats:** Sed.

Indigofera (3 species)

Indigofera blanchetiana Benth. **States:** RN(1). **Habitats:** Unc.

Indigofera microcarpa Desv. **Habits:** ?(1). **States:** PE(2). **Habitats:** Aqua, Riv.

Indigofera suffruticosa Mill. **Habits:** shrub(2); subshrub(3). **Life forms:** chamaephyte(2). **States:** BA(2); CE(4); PB(1); PE(2); PI(1). **Habitats:** Ins, Riv, Sed, Trans.

Inga (4 species)

Inga capitata Desv. **States:** PB(1). **Habitats:** Agre.

Inga ingoides (Rich.) Willd. **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Inga striata Benth. **States:** PB(1). **Habitats:** Riv.

Inga vera Willd. **Life forms:** phanerophyte(1). **States:** PE(4). **Habitats:** Ins, Riv.

Leptolobium (1 species)

Leptolobium dasycarpum Vogel [Synonyms: *Acosmium dasycarpum* (Vogel) Yakovlev; *Sweetia dasycarpa* (Vogel) Benth.] **States:** BA(1). **Habitats:** Diam.

Leucochloron (1 species)

Leucochloron limae Barneby & J.W.Grimes **States:** MG(4). **Habitats:** Arb.

Libidibia (1 species)

Libidibia ferrea (Mart. ex Tul.) L.P.Queiroz [Synonyms: *Caesalpinia ferrea* Mart. ex Tul.] **Habits:** shrub(1); tree(14); treelet(1). **Life forms:** phanerophyte(3). **States:** CE(5); PB(15); PE(15); PI(4); RN(10). **Habitats:** Agre, CMaior, Cryst, Riv, Sed, Trans, Unc, Ins.

Libidibia ferrea var. ***leiostachya*** (Benth.) L.P.Queiroz [Synonyms: *Caesalpinia leiostachya* (Benth.) Ducke] **Habits:** tree(1). **States:** PB(2); PE(2). **Habitats:** Agre, Riv.

Lonchocarpus (6 species)

Lonchocarpus araripensis Benth. **Habits:** tree(3); treelet(1). **Life forms:** phanerophyte(2). **States:** CE(4); PE(1); PI(1). **Habitats:** Sed, Trans.

Lonchocarpus campestris Mart. ex Benth. **States:** PB(2). **Habitats:** Riv.

Lonchocarpus costatus Benth. [Synonyms: *Deguelia costata* (Benth.) A.M.G.Azevedo] **States:** MG(2). **Habitats:** Arb.

Lonchocarpus obtusus Benth. **Habits:** tree(3). **States:** PB(4). **Habitats:** Cryst, Riv.

Lonchocarpus sericeus (Poir.) Kunth ex DC. **Habits:** tree(5). **States:** PB(4); PE(2); PI(1). **Habitats:** Cryst, Riv, Trans.

Lonchocarpus virgilioides (Vogel) Benth. **States:** BA(1). **Habitats:** Ins.

Luetzelburgia (1 species)

Luetzelburgia auriculata (Allemão) Ducke **Habits:** tree(7). **Life forms:** phanerophyte(2).

States: CE(2); PB(5); PE(2); PI(6). **Habitats:** CMaior, Cryst, Ins, Riv, Sed, Trans.

Machaerium (12 species)

Machaerium aculeatum Raddi **States:** MG(3); PB(1). **Habitats:** Arb, Agre.

Machaerium acutifolium Vogel **Habits:** tree(6). **Life forms:** phanerophyte(2). **States:** BA(1); CE(7); MG(4); PI(5). **Habitats:** Arb, CMaior, Diam, Sed, Trans.

Machaerium amplum Benth. **Habits:** tree(1). **States:** CE(1). **Habitats:** Sed.

Machaerium brasiliense Vogel **States:** MG(6). **Habitats:** Arb.

Machaerium floridum (Mart. ex Benth.) Ducke **States:** MG(1). **Habitats:** Arb.

Machaerium hirtum (Vell.) Stellfeld [Synonyms: *Machaerium angustifolium* Vogel] **States:** MG(3). **Habitats:** Arb.

Machaerium opacum Vogel **States:** MG(1). **Habitats:** Arb.

Machaerium ovalifolium Glaz. ex Rudd **Habits:** liana(1); shrub(1). **States:** CE(1); PI(2). **Habitats:** Sed.

Machaerium scleroxylon Tul. **States:** MG(5). **Habitats:** Arb.

Machaerium stipitatum (DC.) Vogel **Habits:** shrub(1); tree(1). **Life forms:** phanerophyte(1). **States:** CE(2). **Habitats:** Sed.

Machaerium vestitum Vogel **States:** CE(1). **Habitats:** Sed.

Machaerium villosum Vogel **States:** MG(4). **Habitats:** Arb.

Macroptilium (5 species)

Macroptilium bracteatum (Nees & Mart.) Maréchal & Baudet **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Macroptilium gracile (Poepp. ex Benth.) Urb. **Habits:** climber(1). **States:** PE(2). **Habitats:** Aqua, Trans.

Macroptilium lathyroides (L.) Urb. **States:** BA(2); RN(1). **Habitats:** Aqua, Unc.

Macroptilium martii (Benth.) Maréchal & Baudet **Habits:** climber(1); herb(3). **Life forms:** liana(1); therophyte(4). **States:** CE(2); PE(4); PI(2); RN(1). **Habitats:** Cryst, Ins, Sed, Trans, Unc.

Macroptilium panduratum (Mart. ex Benth.) Maréchal & Baudet **Habits:** herb(1). **States:** PI(1). **Habitats:** Trans.

Martiodendron (1 species)

Martiodendron mediterraneum (Mart. ex Benth.) R.C.Koeppen **Habits:** tree(1). **States:** PI(3). **Habitats:** CMaior.

Mimosa (28 species)

Mimosa acutistipula (Mart.) Benth. **Habits:** tree(4). **Life forms:** phanerophyte(2). **States:** CE(2); PB(1); PE(4); PI(2); RN(1). **Habitats:** Cryst, Sed, Trans, Unc.

Mimosa adenophylla Taub. **Habits:** subshrub(1). **States:** BA(1); PB(1); PE(1). **Habitats:** Cryst, Sed.

Mimosa arenosa (Willd.) Poir. [Synonyms: *Mimosa malacocentra* (Mart.) Benth] **Habits:** shrub(3); tree(3). **Life forms:** phanerophyte(2). **States:** BA(3); PB(5); PE(11); RN(1). **Habitats:** Agre, Aqua, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

Mimosa bimucronata (DC.) Kuntze **Habits:** tree(1). **States:** PE(3). **Habitats:** Riv.

Mimosa borboremae Harms **States:** PB(1). **Habitats:** Cryst.

Mimosa caesalpiniifolia Benth. **Habits:** shrub(1); tree(1). **Life forms:** phanerophyte(2). **States:** CE(8); PI(3); RN(4). **Habitats:** CMaior, Cryst, Unc.

Mimosa camporum Benth. **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Ins.

Mimosa gemmulata Barneby **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

Mimosa guaranitica Chodat & Hassl. **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

Mimosa honesta Mart. **States:** PB(2). **Habitats:** Cryst, Riv.

Mimosa invisa Mart. ex Colla **Habits:** shrub(4). **Life forms:** phanerophyte(2). **States:** BA(1); CE(3); PE(1). **Habitats:** Ins, Sed, Trans.

Mimosa lepidophora Rizzini **Habits:** tree(2). **States:** PI(2). **Habitats:** Trans.

Mimosa lewisii Barneby **Habits:** climber(1); shrub(2). **Life forms:** microphanerophyte(1). **States:** BA(1); PE(6). **Habitats:** Sed.

Mimosa misera Benth. **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Mimosa modesta Mart. **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

Mimosa niederleinii Burkart **States:** PE(1). **Habitats:** Cryst.

Mimosa nothopteris Barneby **Habits:** treelet(1). **States:** PI(2). **Habitats:** CMaior.

Mimosa ophthalmocentra Mart. ex Benth. **Habits:** tree(6). **Life forms:** phanerophyte(1).

States: PB(9); PE(6); PI(2); RN(1). **Habitats:** Agre, CMaior, Cryst, Ins, Riv, Trans, Unc.

Mimosa paraibana Barneby **Habits:** shrub(2). **Life forms:** phanerophyte(1). **States:** PB(4). **Habitats:** Cryst, Ins, Riv.

Mimosa pigra L. **Habits:** shrub(2). **States:** PE(4). **Habitats:** Riv.

Mimosa pudica L. **States:** BA(2); RN(1). **Habitats:** Aqua, Unc.

Mimosa quadrivalvis L. **Habits:** liana(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Mimosa quadrivalvis var. ***leptocarpa*** (DC.) Barneby [Synonyms: *Schrankia leptocarpa* DC.] **Habits:** climber(1); subshrub(1). **Life forms:** phanerophyte(1). **States:** PB(2); PE(1); RN(1). **Habitats:** Agre, Ins, Unc.

Mimosa sensitiva L. **Habits:** climber(2); liana(1); shrub(1); tree(1). **Life forms:** chamaephyte(1); hemicryptophyte(1); therophyte(1). **States:** CE(2); PB(3); PE(2); PI(1). **Habitats:** Agre, Ins, Sed, Trans, Unc.

Mimosa somnians Humb. & Bonpl. ex Willd. **Habits:** shrub(1). **States:** PI(1). **Habitats:** Trans.

Mimosa tenuiflora (Willd.) Poir. [Synonyms: *Mimosa hostilis* (Mart.) Benth.; *Mimosa nigra* Huber] **Habits:** shrub(2); tree(13). **Life forms:** phanerophyte(4). **States:** BA(2); CE(6); MG(8); PB(24); PE(13); PI(2); RN(26). **Habitats:** Agre, Arb, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

Mimosa ursina Mart. **Habits:** herb(1); subshrub(1). **Life forms:** chamaephyte(1); phanerophyte(1). **States:** CE(2); PE(1). **Habitats:** Cryst, Ins, Sed.

Mimosa verrucosa Benth. **Habits:** tree(3). **Life forms:** phanerophyte(2). **States:** CE(3); PI(2). **Habitats:** Sed, Trans.

Mimosa xiquexiquensis Barneby **Habits:** subshrub(1). **States:** BA(1). **Habitats:** Sed.

Myroxylon (1 species)

Myroxylon peruiferum L.f. **Habits:** tree(1). **States:** PB(1). **Habitats:** Riv.

Ormosia (1 species)

Ormosia fastigiata Tul. **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Parapiptadenia (2 species)

Parapiptadenia blanchetii (Benth.) Vaz & M.P.Lima **Habits:** tree(1). **States:** BA(1); PI(1). **Habitats:** Ins, Trans.

Parapiptadenia zehntneri (Harms) M.P.Lima & H.C.Lima [Synonyms: *Piptadenia zehntneri* Harms] **Habits:** shrub(1); tree(4). **States:** CE(2); PB(2); PE(9). **Habitats:** Cryst, Ins, Riv, Sed, Trans, Unc.

Parkia (1 species)

Parkia platycephala Benth. **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(1); PI(1). **Habitats:** CMaior, Sed.

Parkinsonia (1 species)

Parkinsonia aculeata L. **Habits:** tree(1). **States:** PE(2). **Habitats:** Ins, Riv.

Peltogyne (2 species)

Peltogyne confertiflora (Mart. ex Hayne) Benth. **Habits:** tree(3). **Life forms:** phanerophyte(2). **States:** CE(3); PI(2). **Habitats:** Sed, Trans.

Peltogyne pauciflora Benth. [Synonyms: *Cynometra glaziovii* Taub.] **Habits:** tree(5). **States:** BA(4); PB(2); PE(3). **Habitats:** Ins, Riv, Sed.

Peltophorum (1 species)

Peltophorum dubium (Spreng.) Taub. **States:** BA(1); MG(3); RN(1). **Habitats:** Arb, Diam, Unc.

Periandra (2 species)

Periandra coccinea (Schrad.) Benth. **Habits:** liana(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Periandra mediterranea (Vell.) Taub. **States:** BA(1). **Habitats:** Sed.

Piptadenia (4 species)

Piptadenia gonoacantha (Mart.) J.F.Macbr. **States:** MG(2). **Habitats:** Arb.

Piptadenia macradenia Benth. **States:** MG(1). **Habitats:** Arb.

Piptadenia stipulacea (Benth.) Ducke **Habits:** shrub(5); tree(11); treelet(1). **Life forms:** phanerophyte(5). **States:** CE(8); PB(18); PE(16); PI(3); RN(17). **Habitats:** Agre, Cryst, Ins, Riv, Sed, Trans, Unc.

Piptadenia viridiflora (Kunth) Benth. [Synonyms: *Piptadenia biuncifera* Benth.] **Habits:** tree(2). **Life forms:** phanerophyte(1).

States: BA(1); CE(2); MG(6); PB(4); PE(1); RN(1). **Habitats:** Agre, Arb, Cryst, Diam, Sed, Unc.

Pithecellobium (2 species)

Pithecellobium diversifolium Benth. **Life forms:** phanerophyte phanerophyte. **States:** PB(4); PE(3). **Habitats:** Agre, Cryst, Riv.

Pithecellobium roseum (Vahl) Barneby & J.W.Grimes var. ***roseum*** [Synonyms: *Pithecellobium parviflorum* Pittier] **Habits:** tree(2). **States:** PE(3). **Observations:** Cited occasionally as *P. parviflorum* Benth., but the correct author is Pittier. Possibly a misidentification, as this is an Amazonian species. **Habitats:** Agre, Riv.

Pityrocarpa (2 species)

Pityrocarpa moniliformis (Benth.) Luckow & R.W.Jobson [Synonyms: *Piptadenia moniliformis* Benth.] **Habits:** tree(10). **Life forms:** phanerophyte(3). **States:** BA(2); CE(9); PE(1); PI(4); RN(5). **Habitats:** Diam, Sed, Trans, Unc.

Pityrocarpa obliqua (Pers.) Brenan [Synonyms: *Piptadenia obliqua* (Pers.) J.F.Macbr.] **Habits:** tree(4); treelet(1). **Life forms:** microphanerophyte(1). **States:** BA(1); PE(8); PI(2); RN(1). **Habitats:** Cryst, Sed, Trans, Unc.

Plathymenia (1 species)

Plathymenia reticulata Benth. **Habits:** tree(2). **Life forms:** phanerophyte(1). **States:** CE(1); PI(1). **Habitats:** Sed, Trans.

Platymiscium (1 species)

Platymiscium floribundum Vogel **Habits:** tree(1). **States:** CE(1); MG(5). **Habitats:** Arb, Trans.

Platymiscium floribundum Vogel var. ***floribundum*** [Synonyms: *Platymiscium blanchetii* Benth.] **States:** MG(3). **Habitats:** Arb.

Platypodium (1 species)

Platypodium elegans Vogel **Habits:** shrub(3); tree(3). **Life forms:** phanerophyte(1). **States:** CE(4); PI(3). **Habitats:** Sed, Trans.

Poecilanthe (4 species)

Poecilanthe falcata (Vell.) Heringer **States:** MG(1). **Habitats:** Arb.

Poecilanthe grandiflora Benth. **Habits:** tree(1). **States:** CE(1). **Habitats:** Trans.

Poecilanthe subcordata Benth. **States:** BA(1). **Habitats:** Diam.

Poecilanthe ulei (Harms) Arroyo & Rudd **Habits:** tree(3). **States:** BA(2); PB(2). **Habitats:** Diam, Ins, Riv.

Poeppigia (1 species)

Poeppigia procera C.Presl **Habits:** tree(7). **Life forms:** phanerophyte(1). **States:** BA(4); CE(1); PE(5); PI(6). **Habitats:** Diam, Ins, Riv, Sed, Trans, Sed.

Poincianella (5 species)

Poincianella bracteosa (Tul.) L.P.Queiroz [Synonyms: *Caesalpinia bracteosa* Tul.] **Habits:** shrub(2); tree(3). **Life forms:** phanerophyte(3). **States:** CE(7); PE(2); PI(5); RN(6). **Habitats:** CMaior, Cryst, Sed, Trans, Unc.

Poincianella gardneriana (Benth.) L.P.Queiroz [Synonyms: *Caesalpinia gardneriana* Benth.] **Habits:** tree(3). **Life forms:** phanerophyte(2). **States:** CE(2); PE(5). **Habitats:** Cryst, Ins, Trans.

Poincianella microphylla (Mart. ex G.Don) L.P.Queiroz [Synonyms: *Caesalpinia microphylla* Mart. ex G.Don] **Life forms:** phanerophyte microphanerophyte. **States:** BA(2); MG(6); PE(14); PI(1). **Habitats:** Arb, Cryst, Diam, Riv, Sed, Trans.

Poincianella pluviosa (DC.) L.P.Queiroz [Synonyms: *Caesalpinia pluviosa* DC.] **States:** MG(4). **Habitats:** Arb.

Poincianella pyramidalis (Tul.) L.P.Queiroz [Synonyms: *Caesalpinia pyramidalis* Tul.] **Habits:** shrub(3); tree(11). **States:** BA(3); CE(1); PB(30); PE(19); RN(22). **Habitats:** Agre, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

Pterocarpus (4 species)

Pterocarpus monophyllus Klitg., L.P.Queiroz & G.P.Lewis **Habits:** tree(1). **States:** BA(2). **Habitats:** Sed.

Pterocarpus rohrii Vahl [Synonyms: *Pterocarpus violaceus* var. *angustifolia* Benth.; *Pterocarpus violaceus* Vogel] **States:** BA(1). **Habitats:** Diam.

Pterocarpus villosus (Mart. ex Benth.) Benth. **Habits:** shrub(1); tree(1). **Life forms:** phanerophyte(1). **States:** CE(1); PI(3). **Habitats:** Sed.

Pterocarpus zehntneri Harms **States:** MG(1). **Habitats:** Arb.

Pterodon (1 species)

Pterodon abruptus (Moric.) Benth. **Habits:** tree(3). **States:** BA(1); PI(5). **Habitats:** Diam, Sed, Trans.

Pterogyne (1 species)

Pterogyne nitens Tul. **States:** BA(1); MG(4). **Habitats:** Arb, Diam.

Rhynchosia (2 species)

Rhynchosia minima (L.) DC. **States:** BA(1); PE(1). **Habitats:** Aqua.

Rhynchosia phaseoloides (Sw.) DC. **Habits:** climber(1); subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(2); PB(1). **Habitats:** Agre, Sed.

Senegalia (9 species)

Senegalia bahiensis (Benth.) Seigler & Ebinger [Synonyms: *Acacia bahiensis* Benth.] **Habits:** treelet(1). **States:** BA(2); MG(4); PE(3). **Habitats:** Agre, Arb, Ins, Sed.

Senegalia langsdorffii (Benth.) Seigler & Ebinger [Synonyms: *Acacia langsdorffii* Benth.] **Habits:** shrub(7); tree(2). **Life forms:** phanerophyte(3). **States:** BA(2); CE(9); MG(1); PI(3). **Habitats:** Arb, Diam, Ins, Sed, Trans.

Senegalia martii (Benth.) Seigler & Ebinger [Synonyms: *Acacia martii* Benth.] **States:** MG(2). **Habitats:** Arb.

Senegalia martiusiana (Steud.) Seigler & Ebinger [Synonyms: *Acacia adhaerens* Benth.] **States:** PI(1). **Habitats:** Sed.

Senegalia monacantha (Willd.) Seigler & Ebinger [Synonyms: *Acacia monacantha* Willd.] **States:** MG(1). **Habitats:** Arb.

Senegalia piauhiensis (Benth.) Seigler & Ebinger [Synonyms: *Acacia piauhiensis* Benth.] **Habits:** shrub(2); tree(2). **Life forms:** phanerophyte(1). **States:** BA(2); PE(5); PI(2). **Habitats:** Cryst, Diam, Sed, Trans.

Senegalia polyphylla (DC.) Britton & Rose [Synonyms: *Acacia glomerosa* Benth.; *Acacia polyphylla* DC.] **Habits:** shrub(1); tree(5). **Life forms:** phanerophyte(1). **States:** BA(1); CE(4); MG(2); PB(4); PE(4); RN(1). **Habitats:** Agre, Arb, Diam, Ins, Sed, Trans, Unc.

Senegalia riparia (Kunth) Britton & Rose ex Britton & Killip [Synonyms: *Acacia riparia* Kunth] **Habits:** shrub(1); tree(3). **States:** BA(1); CE(1); PB(1); PI(2); RN(1). **Habitats:** Diam, Ins, Sed, Trans, Unc.

Senegalia tenuifolia (L.) Britton & Rose [Synonyms: *Acacia claussenii* Benth.; *Acacia paniculata* Willd.; *Acacia tenuifolia* (L.) Willd.] **Habits:** shrub(3); tree(4). **Life forms:** phanerophyte(1). **States:** BA(2); CE(4); MG(1); PB(1); PE(4). **Habitats:** Agre, Arb, Cryst, Diam, Riv, Sed, Trans.

Senna (21 species)

Senna acuruensis (Benth.) H.S.Irwin & Barneby [Synonyms: *Cassia acuruensis* Benth.; *Senna acuruensis* (Benth.) H.S.Irwin & Barneby var. *acuruensis*] **Habits:** shrub(2). **Life forms:** phanerophyte(1). **States:** BA(2); PE(1); PI(5). **Habitats:** CMaior, Diam, Sed.

Senna angulata (Vogel) H.S.Irwin & Barneby [Synonyms: *Cassia angulata* Vogel] **States:** BA(1); PB(1). **Habitats:** Agre, Sed.

Senna aversiflora (Herb.) H.S.Irwin & Barneby **Life forms:** phanerophyte(2). **States:** PE(2). **Habitats:** Ins.

Senna cana (Nees & Mart.) H.S.Irwin & Barneby **Habits:** shrub(1); tree(2). **States:** BA(1); PE(5). **Habitats:** Diam, Sed.

Senna catingae (Harms) L.P.Queiroz **States:** BA(1). **Habitats:** Diam.

Senna cearensis Afr.Fern. [Synonyms: *Senna barnebyana* Afr.Fern.] **Habits:** shrub(6). **Life forms:** phanerophyte(3). **States:** CE(8); PI(3). **Habitats:** Sed, Trans.

Senna gardneri (Benth.) H.S.Irwin & Barneby **Habits:** shrub(6). **Life forms:** phanerophyte(2). **States:** BA(2); CE(3); PB(1); PI(4). **Habitats:** Ins, Sed, Trans.

Senna georgica H.S.Irwin & Barneby **States:** RN(1). **Habitats:** Unc.

Senna lechriosperma H.S.Irwin & Barneby **Habits:** shrub(2). **Life forms:** phanerophyte(2). **States:** CE(2). **Habitats:** Sed.

Senna macranthera (DC. ex Collad.) H.S.Irwin & Barneby **Habits:** shrub(2); tree(1). **Life forms:** phanerophyte(2). **States:** BA(2); CE(6); MG(2); PB(4); PE(11); PI(3); RN(2). **Habitats:** Cryst, Ins, Riv, Sed, Trans, Riv, Sed, Trans, Arb, Cryst, Ins, Sed, Trans, Unc, Sed, Riv.

Senna martiana (Benth.) H.S.Irwin & Barneby [Synonyms: *Cassia martiana* Benth.] **Habits:** shrub(3). **Life forms:** phanerophyte(2). **States:** PB(7); PE(2). **Habitats:** Cryst, Ins, Riv.

Senna multijuga (Rich.) H.S.Irwin & Barneby **States:** CE(1). **Habitats:** Unc.

Senna obtusifolia (L.) H.S.Irwin & Barneby **Habits:** subshrub(1). **Life forms:** chamaephyte(1).

States: CE(1); PE(1); RN(2). **Habitats:** Aqua, Cryst, Unc.

Senna occidentalis (L.) Link **Habits:** shrub(2). **States:** PE(1); PI(1). **Habitats:** Sed, Trans.

Senna rizzinii H.S.Irwin & Barneby **Habits:** shrub(4); tree(4). **Life forms:** phanerophyte(1). **States:** BA(1); PB(1); PE(10); RN(1). **Habitats:** Cryst, Diam, Ins, Sed, Trans, Unc.

Senna rugosa (G.Don) H.S.Irwin & Barneby **Habits:** shrub(2). **Life forms:** phanerophyte(2). **States:** CE(2). **Habitats:** Sed.

Senna spectabilis (DC.) H.S.Irwin & Barneby **Habits:** shrub(4); tree(3). **Life forms:** phanerophyte(1). **States:** BA(3); CE(1); MG(5); PB(9); PE(11); PI(2); RN(1). **Habitats:** Agre, Arb, Cryst, Diam, Ins, Riv, Sed, Trans, Unc, Cryst, Riv, Trans.

Senna splendida (Vogel) H.S.Irwin & Barneby **Habits:** shrub(3); tree(2). **Life forms:** phanerophyte(1). **States:** BA(1); CE(2); PB(3); PE(4). **Habitats:** Agre, Diam, Riv, Sed, Trans, Sed.

Senna trachypus (Benth.) H.S.Irwin & Barneby **Habits:** shrub(7); subshrub(2); tree(1). **Life forms:** phanerophyte(4). **States:** CE(10); PE(2); PI(3). **Habitats:** Cryst, Sed, Trans.

Senna uniflora (Mill.) H.S.Irwin & Barneby **Habits:** herb(2); shrub(1). **Life forms:** hemicryptophyte(2). **States:** BA(3); PE(4); RN(2). **Habitats:** Aqua, Cryst, Trans, Unc.

Senna velutina (Vogel) H.S.Irwin & Barneby [Synonyms: *Cassia velutina* Vogel] **Habits:** shrub(1). **States:** PI(2). **Habitats:** Sed, Trans.

Sesbania (2 species)

Sesbania exasperata Kunth **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Riv.

Sesbania virgata (Cav.) Pers. [Synonyms: *Sesbania marginata* Benth.] **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Cryst.

Stryphnodendron (1 species)

Stryphnodendron coriaceum Benth. **States:** PI(1). **Habitats:** CMaior.

Stylosanthes (6 species)

Stylosanthes angustifolia Vogel **States:** RN(2). **Habitats:** Cryst, Unc.

Stylosanthes capitata Vogel **Habits:** herb(1); subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(2). **Habitats:** Sed.

Stylosanthes guianensis (Aubl.) Sw. **Habits:** herb(1). **States:** BA(2); PE(1). **Habitats:** Aqua, Riv.

Stylosanthes humilis Kunth **Habits:** herb(1). **Life forms:** therophyte(3). **States:** CE(3). **Habitats:** Cryst, Ins.

Stylosanthes scabra Vogel **Life forms:** therophyte(1). **States:** PB(1); PE(2). **Habitats:** Aqua, Cryst, Ins.

Stylosanthes viscosa (L.) Sw. **Habits:** herb(1). **States:** BA(3); PB(1); PE(2). **Habitats:** Cryst, Ins, Sed.

Swartzia (1 species)

Swartzia flaemingii Raddi **Habits:** tree(5). **Life forms:** phanerophyte(3). **States:** CE(8); PI(4). **Habitats:** Sed, Trans.

Tachigali (2 species)

Tachigali aurea Tul. [Synonyms: *Sclerolobium aureum* (Tul.) Benth.] **States:** PI(1). **Habitats:** CMaior.

Tachigali densiflora (Benth.) L.G.Silva & H.C.Lima [Synonyms: *Sclerolobium densiflorum* Benth.] **Habits:** shrub(1). **States:** PI(1). **Habitats:** Trans.

Tephrosia (2 species)

Tephrosia cinerea (L.) Pers. **States:** PE(1); RN(1). **Habitats:** Aqua, Unc.

Tephrosia purpurea (L.) Pers. **States:** PE(1). **Habitats:** Aqua.

Trischidium (2 species)

Trischidium decipiens (R.S.Cowan) H.E.Ireland [Synonyms: *Bocoa decipiens* R.S.Cowan] **Habits:** shrub(1). **States:** CE(1); PI(1). **Habitats:** Sed.

Trischidium molle (Benth.) H.E.Ireland [Synonyms: *Bocoa mollis* (Benth.) Cowan] **Habits:** shrub(10). **Life forms:** microphanerophyte(1). **States:** BA(3); CE(2); PE(8); PI(4). **Habitats:** Sed, Trans.

Vachellia (1 species)

Vachellia farnesiana (L.) Wight & Arn. [Synonyms: *Acacia farnesiana* (L.) Willd.] **Habits:** tree(1). **States:** PB(3); PE(1); RN(1). **Habitats:** Agre, Cryst, Riv, Unc.

Vatairea (1 species)

Vatairea macrocarpa (Benth.) Ducke **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Vigna (2 species)

Vigna halophila (Piper) Maréchal et al. **States:** BA(1). **Habitats:** Ins.

Vigna peduncularis (Kunth) Fawc. & Rendle [Synonyms: *Phaseolus peduncularis* Kunth] **Habits:** climber(3). **Life forms:** liana(1); therophyte(2). **States:** PE(6); PI(1). **Habitats:** Agre, Ins, Sed, Trans.

Zornia (9 species)

Zornia brasiliensis Vogel **Habits:** herb(2). **Life forms:** therophyte(2). **States:** PE(2); RN(1). **Habitats:** Trans, Unc.

Zornia curvata Mohlenbr. **Habits:** herb(1). **States:** PB(1). **Habitats:** Ins.

Zornia diphylla (L.) Pers. **Habits:** tree(1). **Life forms:** therophyte(1). **States:** PB(1); PE(1). **Habitats:** Ins, Sed.

Zornia gardneriana Moric. **Habits:** herb(1). **States:** PI(1). **Habitats:** Trans.

Zornia gemella Vogel **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Trans.

Zornia glabra Desv. **States:** PB(1). **Habitats:** Cryst.

Zornia myriadena Benth. **Life forms:** therophyte(1). **States:** BA(1); PE(1). **Habitats:** Ins.

Zornia reticulata Sm. **States:** PB(1). **Habitats:** Cryst.

Zornia sericea Moric. **Habits:** herb(5). **Life forms:** therophyte(1). **States:** BA(1); CE(1); PE(4). **Habitats:** Ins, Sed, Trans.

GENTIANACEAE (1 genus; 1 species)

Schultesia (1 species)

Schultesia guianensis (Aubl.) Malme **Life forms:** therophyte(2). **States:** CE(1); PE(2). **Habitats:** Ins.

GESNERIACEAE (2 genera; 3 species)

Paliavana (1 species)

Paliavana tenuiflora Mansf. **Life forms:** phanerophyte(2). **States:** PE(3). **Habitats:** Ins.

Sinningia (2 species)

Sinningia incarnata (Aubl.) D.L.Denham **Life forms:** hemicryptophyte(1). **States:** CE(1). **Habitats:** Ins.

Sinningia nordestina Chautems **Life forms:** therophyte(2). **States:** PE(3). **Habitats:** Ins.

HYDROCHARITACEAE (3 genera; 3 species)

Egeria (1 species)

Egeria densa Planch. **States:** BA(3). **Habitats:** Aqua.

Limnobium (1 species)

Limnobium laevigatum (Humb. & Bonpl. ex Willd.) Heine **States:** BA(3). **Habitats:** Aqua.

Najas (1 species)

Najas conferta (A.Braun) A.Braun **States:** BA(1). **Habitats:** Aqua.

HYDROLEACEAE (1 genus; 1 species)

Hydrolea (1 species)

Hydrolea spinosa L. **Habits:** subshrub(1). **States:** BA(7); CE(1); PE(1). **Habitats:** Aqua, Ins, Trans.

HYPERICACEAE (1 genus; 2 species)

Vismia (2 species)

Vismia guianensis (Aubl.) Choisy **States:** PE(1). **Habitats:** Ins.

Vismia micrantha A.St.-Hil. **Habits:** shrub(1). **States:** BA(1). **Habitats:** Diam.

HYPOXIDACEAE (1 genus; 1 species)

Hypoxis (1 species)

Hypoxis decumbens L. **States:** PE(1). **Habitats:** Ins.

IRIDACEAE (2 genera; 2 species)

Cipura (1 species)

Cipura paludosa Aubl. **Habits:** herb(1). **Life forms:** cryptophyte-geo(1). **States:** PE(2). **Habitats:** Ins, Trans.

Neomarica (1 species)

Neomarica gracilis (Herb.) Sprague **States:** PE(1). **Habitats:** Ins.

KRAMERIACEAE (1 genus; 1 species)

Krameria (1 species)

Krameria tomentosa A.St.-Hil. **Habits:** ?(1); subshrub(1). **States:** BA(1); PE(1); PI(1). **Habitats:** Sed, Trans.

LAMIACEAE (11 genus; 26 species)

Aegiphila (2 species)

Aegiphila pernambucensis Moldenke **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

Aegiphila smithii Moldenke **States:** MG(2). **Habitats:** Arb.

Amasonia (1 species)

Amasonia campestris (Aubl.) Moldenke [Synonyms: *Amasonia coccinea* Liebm. & Moldenke] **Habits:** herb(1); subshrub(2). **Life forms:** chamaephyte(3). **States:** CE(3); PI(1). **Habitats:** Sed.

Eriope (1 species)

Eriope hypenioides Mart. ex Benth. **States:** BA(1). **Habitats:** Sed.

Hypenia (1 species)

Hypenia salzmannii (Benth.) Harley [Synonyms: *Hyptis salzmannii* Benth.] **Habits:** herb(2); subshrub(2). **Life forms:** therophyte(2). **States:** BA(1); CE(1); PE(2); PI(1). **Habitats:** Sed, Trans.

Hyptidendron (1 species)

Hyptidendron amethystoides (Benth.) Harley **Habits:** subshrub(1). **States:** CE(1). **Habitats:** Sed.

Hyptis (11 species)

Hyptis atrorubens Poit. **Habits:** herb(2). **Life forms:** therophyte(2). **States:** PE(3). **Habitats:** Cryst, Trans.

Hyptis calida Mart. ex Benth. **Life forms:** phanerophyte(2). **States:** PE(2). **Habitats:** Ins.

Observations: Subsequently recognised as distinct from *Hyptis* and given the new combination *Leptohyptis calida* (Mart. ex Benth.) R.M.Harley & J.F.B.Pastore.

Hyptis dilatata Benth. **States:** BA(1). **Habitats:** Sed.

Hyptis fruticosa Salzm. ex Benth. **Habits:** shrub(2); subshrub(1). **States:** BA(2); PE(5). **Habitats:** Ins, Sed.

Observations: Subsequently recognised as distinct from *Hyptis* and given the new combination *Eplingiella fruticosa* (Salzm. ex Benth.) Harley & J.F.B. Pastore.

Hyptis martiusii Benth. **Habits:** shrub(3); subshrub(1). **Life forms:** nanophanerophyte(1). **States:** BA(2); PE(6). **Habitats:** Diam, Sed.

Observations: Subsequently recognised as distinct from *Hyptis* and given the new combination *Medusantha martiusii* (Benth.) Harley & J.F.B. Pastore.

Hyptis multiflora Pohl **Habits:** subshrub(1). **States:** PI(1). **Habitats:** Trans.

Observations: Subsequently recognised as distinct from *Hyptis* and given the new combination *Medusantha multiflora* (Pohl ex Benth.) Harley & J.F.B. Pastore.

Hyptis pectinata (L.) Poit. **Life forms:** chamaephyte(1). **States:** PE(2). **Habitats:** Aqua, Ins.

Observations: Subsequently recognised as distinct from *Hyptis* and treated as *Mesosphaerum pectinatum* (L.) Kuntze.

Hyptis platanifolia Mart. ex Benth. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Observations: Subsequently recognised as distinct from Hyptis and given the new combination *Gymneia platanifolia* (Pohl ex Benth.) Harley & J.F.B. Pastore.

Hyptis sidifolia (L'Hér.) Briq. **Life forms:** chamaephyte(1). **States:** PE(1). **Habitats:** Ins.

Observations: Subsequently recognised as distinct from *Hyptis* and given the new combination *Mesosphaerum sidifolium* (L'Hér.) Harley & J.F.B. Pastore.

Hyptis simulans Epling **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Observations: Subsequently recognised as distinct from *Hyptis* and given the new combination *Medusantha simulans* (Epling) Harley & J.F.B. Pastore.

Hyptis suaveolens Poit. **Habits:** herb(4). **Life forms:** therophyte(3). **States:** BA(1); CE(3); PE(3); RN(3). **Habitats:** Aqua, Cryst, Sed, Trans, Unc.

Observations: Subsequently recognised as distinct from *Hyptis* and treated as *Mesosphaerum suaveolens* (L.) Kuntze**.**

Leonotis (1 species)

Leonotis nepetifolia (L.) R.Br. **Habits:** subshrub(2). **States:** PE(2). **Habitats:** Riv, Sed.

Marsypianthes (1 species)

Marsypianthes chamaedrys (Vahl) Kuntze **Habits:** herb(2). **Life forms:** therophyte(5). **States:** BA(1); CE(4); PB(1); PE(3); RN(3). **Habitats:** Aqua, Cryst, Ins, Sed, Unc.

Ocimum (1 species)

Ocimum campechianum Mill. **States:** BA(1). **Habitats:** Aqua.

Rhaphiodon (1 species)

Rhaphiodon echinus Schauer **Habits:** herb(2). **States:** BA(1); PB(1); PE(1). **Habitats:** Ins, Sed.

Vitex (5 species)

Vitex cymosa Bertero ex Spreng. **Habits:** tree(2). **States:** CE(2); MG(2); PI(3). **Habitats:** Arb, CMaior, Sed.

Vitex gardneriana Schauer **Habits:** shrub(4). **States:** PB(5); PE(1). **Habitats:** Riv.

Vitex polygama Cham. [Synonyms: *Vitex laciniosa* Turcz.] **States:** MG(2). **Habitats:** Arb.

Vitex rufescens A.Juss. [Synonyms: *Vitex regnelliana* Moldenke] **Life forms:** phanerophyte(1). **States:** PE(3). **Habitats:** Ins.

Vitex schaueriana Moldenke **Habits:** tree(2). **Life forms:** phanerophyte(2). **States:** CE(3); PB(1). **Habitats:** Cryst, Sed.

LAURACEAE (3 genera; 6 species)

Cassytha (1 species)

Cassytha filiformis L. [Synonyms: *Cassytha americana* Nees] **Habits:** herb(1). **States:** PE(2). **Habitats:** Ins, Sed.

Nectandra (2 species)

Nectandra membranacea (Sw.) Griseb. **States:** BA(2). **Habitats:** Ins.

Nectandra nitidula Nees **States:** MG(2). **Habitats:** Arb.

Ocotea (3 species)

Ocotea brachybotrya (Meisn.) Mez **States:** PI(1). **Habitats:** CMaior.

Ocotea duckei Vattimo-Gil **Habits:** shrub(1). **States:** CE(1); PE(1). **Habitats:** Sed.

Ocotea xanthocalyx (Nees) Mez **Habits:** shrub(1). **Life forms:** microphanerophyte(1). **States:** PE(3). **Habitats:** Sed.

LENTIBULARIACEAE (1 genus; 5 species)

Utricularia (5 species)

Utricularia breviscapa C.Wright ex Griseb. **States:** BA(1). **Habitats:** Aqua.

Utricularia foliosa L. **States:** BA(1). **Habitats:** Aqua.

Utricularia gibba L. **States:** BA(5). **Habitats:** Aqua.

Utricularia nigrescens Sylvén **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Utricularia pusilla Vahl **States:** PE(1). **Habitats:** Ins.

LIMNOCHARITACEAE (1 genus; 1 species)

Hydrocleis (1 species)

Hydrocleis nymphoides (Willd.) Buchenau **States:** BA(4). **Habitats:** Aqua.

LINDERNIACEAE (1 genus; 1 species)

Micranthemum (1 species)

Micranthemum umbrosum (Walter ex J.F.Gmel.) S.F.Blake **States:** BA(1). **Habitats:** Aqua.

LOASACEAE (2 genera; 2 species)

Aosa (1 species)

Aosa rupestris (Gardner) Weigend [Synonyms: *Loasa rupestris* Gardner] **Life forms:** chamaephyte(1); phanerophyte(1); therophyte(1). **States:** BA(4); PB(1); PE(2). **Habitats:** Ins.

Mentzelia (1 species)

Mentzelia aspera L. [Synonyms: *Mentzelia fragilis* Huber] **Habits:** herb(2). **Life forms:** therophyte(1). **States:** CE(1); PE(2); RN(1). **Habitats:** Agre, Cryst, Trans.

LOGANIACEAE (2 genera; 3 species)

Spigelia (1 species)

Spigelia anthelmia L. **Habits:** herb(1). **Life forms:** therophyte(2). **States:** CE(2). **Habitats:** Cryst.

Strychnos (2 species)

Strychnos parvifolia A.DC. **States:** BA(1); PB(1). **Habitats:** Agre, Ins.

Strychnos rubiginosa A.DC. **Habits:** climber(4); shrub(4); subshrub(1). **States:** CE(4); PE(5); PI(3). **Habitats:** Sed, Trans.

LORANTHACEAE (2 genera; 4 species)

Psittacanthus (1 species)

Psittacanthus cordatus (Hoffmanns.) G.Don [Synonyms: *Psittacanthus bicalyculatus* (Mart.) Mart.] **Habits:** hemiparasite(2). **States:** BA(4); PE(1). **Habitats:** Ins, Sed.

Struthanthus (3 species)

Struthanthus flexicaulis Mart. **States:** BA(2). **Habitats:** Sed.

Struthanthus polyrhizus (Mart.) Mart. **Habits:** epiphyte(1); hemiparasite(1); herb(1). **States:** PE(3). **Habitats:** Sed.

Struthanthus syringifolius (Mart.) Mart. **Habits:** hemiparasite(3); herb(1). **States:** BA(1); PE(3). **Habitats:** Sed.

LYTHRACEAE (4 genera; 9 species)

Ammannia (1 species)

Ammannia latifolia L. **States:** BA(4); PE(1). **Habitats:** Aqua.

Cuphea (6 species)

Cuphea calophylla Cham. & Schltdl. **States:** PB(1). **Habitats:** Cryst.

Cuphea campestris Koehne **Habits:** herb(1). **Life forms:** therophyte(2). **States:** CE(2); PB(1); PE(2). **Habitats:** Cryst, Sed.

Cuphea circaeoides Sm. **Habits:** herb(2). **Life forms:** hemicryptophyte(1); therophyte(2). **States:** CE(2); PE(1). **Habitats:** Cryst, Sed.

Cuphea ericoides Cham. & Schltdl. **Life forms:** therophyte(1). **States:** PI(1). **Habitats:** Sed.

Cuphea impatientifolia A.St.-Hil. [Synonyms: *Cuphea prunellifolia* A.St.-Hil.] **States:** PE(1). **Habitats:** Agre.

Cuphea racemosa (L.f.) Spreng. **States:** PB(1). **Habitats:** Agre.

Lafoensia (1 species)

Lafoensia glyptocarpa Koehne **Habits:** subshrub(1). **Life forms:** microphanerophyte(1). **States:** PB(1); PE(3). **Habitats:** Agre, Sed.

Pleurophora (1 species)

Pleurophora anomala (A. St.-Hil.) Koehne **Life forms:** therophyte(1). **States:** BA(5); CE(1). **Habitats:** Aqua, Cryst.

MALPIGHIACEAE (14 genera; 38 species)

Banisteriopsis (6 species)

Banisteriopsis angustifolia (A.Juss.) B.Gates **Habits:** liana(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Banisteriopsis laevifolia (A.Juss.) B.Gates **Habits:** liana(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Banisteriopsis muricata (Cav.) Cuatrec. **Habits:** climber(1). **States:** BA(1); PE(1). **Habitats:** Sed.

Banisteriopsis oxyclada (A.Juss.) B.Gates **Habits:** liana(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Banisteriopsis schizoptera (A.Juss.) B.Gates **Habits:** climber(2). **States:** PE(2). **Habitats:** Sed.

Banisteriopsis stellaris (Griseb.) B.Gates [Synonyms: *Banisteriopsis stellaris* (Griseb.) B.Gates var. *latifolia*] **Habits:** climber(2); liana(3). **Life forms:** liana(1); phanerophyte(2). **States:** CE(3); PE(2); PI(3). **Habitats:** Sed.

Barnebya (1 species)

Barnebya harleyi W.R.Anderson & B.Gates **Life forms:** phanerophyte(1). **States:** BA(2); PI(1). **Habitats:** Ins, Sed.

Bunchosia (1 species)

Bunchosia pernambucana W.R.Anderson **Habits:** subshrub(2). **States:** PE(2). **Habitats:** Sed.

Byrsonima (7 species)

Byrsonima correifolia A.Juss. **Life forms:** phanerophyte(1). **States:** PI(2). **Habitats:** CMaior, Sed.

Byrsonima crassifolia (L.) Kunth **States:** PI(1); RN(1). **Habitats:** CMaior, Unc.

Byrsonima cydoniifolia A.Juss. **Habits:** shrub(1); tree(1). **States:** BA(1); PE(1). **Habitats:** Diam, Sed.

Byrsonima gardneriana A.Juss. **Habits:** tree(2). **Life forms:** phanerophyte(2). **States:** BA(3); CE(9); PE(4); PI(3). **Habitats:** Sed, Trans.

Byrsonima nitidifolia A.Juss. **States:** BA(1). **Habitats:** Ins.

Byrsonima sericea DC. **Habits:** treelet(1). **States:** PI(3). **Habitats:** CMaior.

Byrsonima vacciniifolia A.Juss. **Habits:** shrub(1); tree(1). **Life forms:** nanophanerophyte(1). **States:** BA(1); PE(3); PI(1). **Habitats:** Diam, Sed.

Callaeum (1 species)

Callaeum psilophyllum (A.Juss.) D.M.Johnson [Synonyms: *Mascagnia psilophylla* (A.Juss.) Griseb.] **Habits:** climber(1). **States:** PE(1). **Habitats:** Trans.

Diplopterys (2 species)

Diplopterys lutea (Griseb.) W.R.Anderson & C.C.Davis [Synonyms: *Banisteriopsis lutea* (Griseb.) Cuatrec.] **States:** BA(1); PB(1). **Habitats:** Agre, Ins.

Diplopterys pubipetala (A.Juss.) W.R.Anderson & C.C.Davi [Synonyms: *Banisteriopsis pubipetala* (A.Juss.) Cuatrec.] **Habits:** climber(1). **States:** PE(1). **Habitats:** Sed.

Galphimia (1 species)

Galphimia brasiliensis (L.) A.Juss. **States:** BA(1); PE(1). **Habitats:** Ins.

Heteropterys (6 species)

Heteropterys campestris A.Juss. [Synonyms: *Heteropterys discolor* A.Juss.] **Habits:** shrub(1). **States:** PI(1). **Habitats:** Trans.

Heteropterys chrysophylla (Lam.) DC. **States:** BA(1). **Habitats:** Ins.

Heteropterys dichromocalyx W.R.Anderson **Habits:** shrub(1). **States:** PI(1). **Habitats:** Trans.

Heteropterys grandiflora A.Juss. **Habits:** liana(1). **States:** CE(1). **Habitats:** Trans.

Heteropterys pteropetala A.Juss. **Habits:** shrub(1). **States:** CE(1). **Habitats:** Trans.

Heteropterys trichanthera A.Juss. **Habits:** climber(1); shrub(2). **Life forms:** phanerophyte(2). **States:** BA(1); CE(2); PE(2). **Habitats:** Cryst, Diam, Ins, Sed.

Janusia (3 species)

Janusia anisandra (A.Juss.) Griseb. **Habits:** climber(1). **States:** PE(1). **Habitats:** Sed.

Janusia janusioides (A.Juss.) W.R.Anderson **Habits:** liana(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Janusia schwannioides W.R.Anderson **States:** BA(1). **Habitats:** Ins.

Mascagnia (2 species)

Mascagnia riparia C.E.Anderson **Habits:** liana(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Cryst.

Mascagnia sepium (A.Juss.) Griseb. **Habits:** climber(1); shrub(1). **States:** CE(1); PE(1). **Habitats:** Agre, Trans.

Peixotoa (1 species)

Peixotoa jussieuana A.Juss. **Habits:** climber(1); liana(4). **Life forms:** phanerophyte(2). **States:** CE(5); PI(5). **Habitats:** Sed, Trans.

Ptilochaeta (1 species)

Ptilochaeta bahiensis Turcz. **Habits:** shrub(2); tree(1); treelet(1). **States:** CE(1); PE(4). **Habitats:** Agre, Sed, Trans.

Stigmaphyllon (5 species)

Stigmaphyllon auriculatum (Cav.) A.Juss. **Habits:** climber(1). **Life forms:** phanerophyte(1). **States:** BA(1); CE(1); PE(1). **Habitats:** Cryst, Ins, Sed.

Stigmaphyllon blanchetii C.E.Anderson **Habits:** climber(1). **States:** PB(1). **Habitats:** Ins.

Stigmaphyllon cavernulosum C.E.Anderson **Habits:** liana(1). **States:** CE(1). **Habitats:** Trans.

Stigmaphyllon paralias A.Juss. **Habits:** climber(1); shrub(1); subshrub(1). **Life forms:** hemicryptophyte(1); phanerophyte(1). **States:** PB(1); PE(4); PI(1). **Habitats:** Ins, Sed.

Stigmaphyllon rotundifolium A.Juss. **Life forms:** phanerophyte(1). **States:** PB(1). **Habitats:** Ins.

Thryallis (1 species)

Thryallis longifolia Mart. **States:** BA(2). **Habitats:** Ins.

MALVACEAE (23 genera; 82 species)

Ayenia (1 species)

Ayenia erecta Mart. ex K.Schum. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(2). **Habitats:** Cryst, Trans.

Bakeridesia (1 species)

Bakeridesia andradelimae Monteiro **States:** PE(1). **Habitats:** Ins.

Briquetia (1 species)

Briquetia spicata (Kunth) Fryxell [Synonyms: *Pseudabutilon spicatum* (Kunth) R.E.Fr.] **Habits:** herb(2). **Life forms:** therophyte(2). **States:** CE(2); PE(1). **Habitats:** Agre, Cryst, Sed.

Byttneria (1 species)

Byttneria filipes Mart. ex K.Schum. **Habits:** shrub(1). **States:** PE(1). **Habitats:** Riv.

Cavanillesia (2 species)

Cavanillesia hylogeiton Ulbr. **States:** BA(1). **Habitats:** Diam.

Cavanillesia umbellata Ruiz & Pav. [Synonyms: *Cavanillesia arborea* (Willd.) K.Schum.] **States:** MG(6). **Habitats:** Arb.

Ceiba (4 species)

Ceiba erianthos (Cav.) K.Schum. **States:** BA(2). **Habitats:** Ins.

Ceiba glaziovii (Kuntze) K.Schum. [Synonyms: *Chorisia glaziovii* (Kuntze) E.Santos] **Habits:** tree(5). **States:** CE(1); PB(6); PE(4). **Habitats:** Agre, Cryst, Riv, Trans, Unc.

Ceiba pubiflora (A.St.-Hil.) K.Schum. **States:** MG(3). **Habitats:** Arb.

Ceiba speciosa (A.St.-Hil.) Ravenna **States:** MG(1). **Habitats:** Arb.

Corchorus (3 species)

Corchorus argutus Kunth **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(2). **Habitats:** Cryst, Unc.

Corchorus hirtus L. **Habits:** herb(4); subshrub(1). **Life forms:** therophyte(4). **States:** BA(2); CE(1); PE(8). **Habitats:** Agre, Aqua, Cryst, Trans.

Corchorus orinocensis Kunth **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Gaya (4 species)

Gaya aurea A.St.-Hil. **Habits:** shrub(1). **States:** PE(1); RN(1). **Habitats:** Riv, Unc.

Gaya gaudichaudiana A.St.-Hil. **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Gaya gracilipes K.Schum. **States:** BA(1). **Habitats:** Sed.

Gaya monosperma (K.Schum.) Krapov. [Synonyms: *Gaya elingulata* Krapov., Tressens & A.Fernández] **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** PE(1). **Habitats:** Cryst.

Guazuma (1 species)

Guazuma ulmifolia Lam. **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(1); MG(2). **Habitats:** Arb, Cryst.

Helicteres (9 species)

Helicteres baruensis Jacq. [Synonyms: *Helicteres mollis* C.Presl] **Habits:** shrub(8). **Life forms:** phanerophyte(1). **States:** BA(2); CE(2); PB(2); PE(3); PI(3); RN(1). **Habitats:** Cryst, Diam, Riv, Sed, Trans, Unc.

Helicteres brevispira A.St.-Hil. **Habits:** shrub(1). **States:** PB(1). **Habitats:** Riv.

Helicteres eichleri K.Schum. **Habits:** shrub(2). **States:** BA(4); PB(3). **Habitats:** Agre, Diam, Ins, Riv.

Helicteres guazumifolia Kunth **States:** PB(1). **Habitats:** Cryst.

Helicteres heptandra L.B.Sm. **Habits:** shrub(4); subshrub(1). **Life forms:** phanerophyte(1). **States:** CE(4); PI(5). **Habitats:** CMaior, Sed, Trans.

Helicteres macropetala A.St.-Hil. **Habits:** shrub(1). **States:** PE(3). **Habitats:** Agre.

Helicteres muscosa Mart. **Habits:** ?(1); shrub(5); subshrub(1). **Life forms:** phanerophyte(3). **States:** CE(7); PI(6). **Habitats:** Sed, Trans.

Helicteres sacarolha A.St.-Hil. et al. **States:** BA(1). **Habitats:** Sed.

Helicteres velutina K.Schum. **Habits:** shrub(4). **Life forms:** microphanerophyte(1). **States:** CE(1); PE(4). **Habitats:** Sed.

Herissantia (3 species)

Herissantia crispa (L.) Brizicky **Habits:** herb(2); shrub(2); subshrub(2). **Life forms:** chamaephyte(3). **States:** BA(1); CE(2); PE(8). **Habitats:** Agre, Cryst, Sed, Trans, Unc.

Herissantia nemoralis (A.St.-Hil.) Brizicky **States:** RN(1). **Habitats:** Unc.

Herissantia tiubae (K.Schum.) Brizicky [Synonyms: *Abutilon tiubae* K.Schum.] **Habits:** herb(1); shrub(3); subshrub(4). **Life forms:** chamaephyte(3). **States:** BA(1); CE(2); PE(11); PI(1). **Habitats:** Cryst, Ins, Riv, Sed, Trans.

Luehea (4 species)

Luehea candicans Mart. & Zucc. **Habits:** shrub(1); tree(1). **States:** CE(2); PI(1). **Habitats:** Sed.

Luehea candicans var. ***candicans*** [Synonyms: *Luehea uniflora* A.St.-Hil.] **Habits:** shrub(1); tree(1). **Life forms:** phanerophyte(1). **States:** CE(2). **Habitats:** Sed, Trans.

Luehea divaricata Mart. & Zucc. **States:** MG(2). **Habitats:** Arb.

Luehea grandiflora Mart. & Zucc. [Synonyms: *Luehea speciosa* Willd.] **Habits:** shrub(1); tree(1). **States:** BA(1); PI(2). **Habitats:** CMaior, Diam.

Luehea paniculata Mart. & Zucc. **States:** MG(2). **Habitats:** Arb.

Malvastrum (2 species)

Malvastrum coromandelianum Garcke **States:** PE(1). **Habitats:** Cryst.

Malvastrum tomentosum (L.) S.R.Hill **States:** PE(1). **Habitats:** Trans.

Malvastrum tomentosum (L.) S.R.Hill subsp. ***tomentosum*** [Synonyms: *Malvastrum scabrum* Garcke] **Habits:** shrub(1). **States:** PE(2). **Habitats:** Agre, Trans.

Melochia (4 species)

Melochia arenosa Benth. **Habits:** shrub(1). **States:** BA(1). **Habitats:** Diam.

Melochia lanata A.St.-Hil. **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Melochia pyramidata L. **Habits:** shrub(3). **States:** BA(1); PB(5). **Habitats:** Aqua, Cryst, Riv.

Melochia tomentosa L. **Habits:** herb(2); shrub(2); subshrub(4). **Life forms:** chamaephyte(1); therophyte(1). **States:** BA(5); PB(5); PE(14); PI(1). **Habitats:** Agre, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

Pachira (1 species)

Pachira retusa (Mart. & Zucc.) Fern.Alonso [Synonyms: *Bombacopsis retusa* A.Robyns] **Habits:** tree(1). **States:** BA(2). **Habitats:** Sed.

Pavonia (6 species)

Pavonia aschersoniana Gürke **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Pavonia blanchetiana Miq. **Habits:** shrub(2). **States:** PE(2). **Habitats:** Sed.

Pavonia cancellata (L.) Cav. [Synonyms: *Pavonia cancellata* var. *deltoidea* (Mart.) A.St.-Hil. & Naudin] **Habits:** herb(1); subshrub(3). **Life forms:** chamaephyte(4); phanerophyte(1). **States:** CE(3); PB(1); PE(4); PI(1); RN(1). **Habitats:** Cryst, Ins, Sed, Trans, Unc.

Pavonia glazioviana Gürke [Synonyms: *Pavonia andrade-limae* Monteiro] **Habits:** shrub(5). **States:** BA(1); CE(4); PE(1); PI(4). **Habitats:** Sed, Trans.

Pavonia humifusa A.St.-Hil. **Habits:** subshrub(1). **States:** BA(1); PE(1). **Habitats:** Sed.

Pavonia varians Moric. **Habits:** subshrub(3). **States:** BA(1); PE(2). **Habitats:** Sed.

Pseudobombax (3 species)

Pseudobombax grandiflorum (Cav.) A.Robyns **States:** PE(1); RN(1). **Habitats:** Cryst, Unc.

Pseudobombax marginatum (A.St.-Hil.) A. Robyns **Habits:** tree(8). **Life forms:** phanerophyte(2). **States:** CE(4); MG(4); PB(13); PE(4); PI(1); RN(1). **Habitats:** Agre, Arb, Cryst, Riv, Sed, Trans, Unc.

Pseudobombax simplicifolium A.Robyns **Habits:** tree(1). **States:** BA(1); MG(6); PB(1); PE(1). **Habitats:** Arb, Cryst, Diam.

Sida (17 species)

Sida acuta Burm.f. **States:** PB(1). **Habitats:** Agre.

Sida angustissima A.St.-Hil. **States:** RN(1). **Habitats:** Unc.

Sida anomala A.St.-Hil. **States:** RN(1). **Habitats:** Unc.

Sida blepharoprion Ulbr. **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Sida castanocarpa Krapov. **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Sida ciliaris L., *Sida ciliaris* does not occur in Brazil thus its use for a plant of the semi-arid is a misidentification (M. Bovini, pers. comm.) **Habits:** subshrub(2). **Life forms:** chamaephyte(2). **States:** CE(2); PB(1). **Habitats:** Cryst, Sed.

Sida cordifolia L. **Habits:** herb(1); shrub(3); subshrub(3). **Life forms:** therophyte(2). **States:** CE(1); PE(7); PI(1); RN(1). **Habitats:** Cryst, Sed, Trans, Unc.

Sida galheirensis Ulbr. **Habits:** herb(3); shrub(3); subshrub(4). **Life forms:** chamaephyte(1). **States:** BA(4); CE(3); PB(2); PE(10). **Habitats:** Cryst, Ins, Sed, Trans.

Sida glomerata Cav. **Habits:** herb(1); subshrub(2). **Life forms:** chamaephyte(1). **States:** CE(1); PE(2); PI(1). **Habitats:** Agre, Sed, Trans.

Sida jussiaeana DC. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Sida linifolia Cav. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(2). **Habitats:** Ins, Sed.

Sida regnellii R.E.Fr. **Habits:** shrub(2). **States:** PE(2). **Habitats:** Trans.

Sida rhombifolia L. **States:** RN(1). **Habitats:** Unc.

Sida rubifolia A.St.-Hil. **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Sida salviifolia C.Presl **Habits:** shrub(1). **States:** CE(1). **Habitats:** Trans.

Sida spinosa L. **Habits:** shrub(1). **States:** BA(1); PE(3); RN(1). **Habitats:** Aqua, Trans, Unc.

Sida ulei Ulbr. [Synonyms: *Sida salzmannii* Mont.] **Life forms:** chamaephyte(1). **States:** PI(1). **Habitats:** Sed.

Sidastrum (3 species)

Sidastrum micranthum (A.St.-Hil.) Fryxell **Habits:** shrub(1). **States:** CE(1). **Habitats:** Trans.

Sidastrum multiflorum (Jacq.) Fryxell [Synonyms: *Sida acuminata* DC.] **Habits:** subshrub(1). **States:** BA(1); PE(2). **Habitats:** Agre, Ins.

Sidastrum paniculatum (L.) Fryxell [Synonyms: *Sida paniculata* L.] **Habits:** subshrub(3). **Life forms:** chamaephyte(1). **States:** BA(2); PB(3); PE(2). **Habitats:** Agre, Ins, Sed.

Sterculia (1 species)

Sterculia striata A.St.-Hil. & Naudin **States:** MG(7). **Habitats:** Arb.

Triumfetta (1 species)

Triumfetta semitriloba Jacq. **States:** PB(1). **Habitats:** Agre.

Waltheria (8 species)

Waltheria albicans Turcz. **Habits:** shrub(1). **States:** PE(1). **Habitats:** Trans.

Waltheria americana L. [Synonyms: *Waltheria indica* L.] **Habits:** herb(2); shrub(2); subshrub(3). **Life forms:** chamaephyte(2); phanerophyte(1); therophyte(1). **States:** BA(2); CE(3); PB(1); PE(9); RN(3). **Habitats:** Aqua, Cryst, Ins, Sed, Trans, Unc.

Waltheria brachypetala Turcz. **Habits:** shrub(1); subshrub(1). **Life forms:** chamaephyte(1). **States:** BA(1); CE(2). **Habitats:** Sed.

Waltheria bracteosa A.St.-Hil. & Naudin **States:** RN(1). **Habitats:** Unc.

Waltheria ferruginea A.St.-Hil. **Habits:** shrub(3); subshrub(3). **Life forms:** phanerophyte(1). **States:** BA(1); CE(4); PE(4); PI(1). **Habitats:** Sed.

Waltheria maritima A.St.-Hil. **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Ins.

Waltheria martiana Benth. ex J.G.Saunders [Synonyms: *Waltheria macropoda* Turcz.] **Habits:** herb(3); subshrub(1). **Life forms:** chamaephyte(4); therophyte(1). **States:** CE(2); PE(3). **Habitats:** Cryst, Trans.

Waltheria rotundifolia Schrank **Habits:** herb(2); shrub(1). **Life forms:** chamaephyte(1); therophyte(1). **States:** PE(4). **Habitats:** Cryst, Trans.

Wissadula (2 species)

Wissadula amplissima (L.) R.E.Fr. **Habits:** shrub(1). **Life forms:** therophyte(1). **States:** CE(2). **Habitats:** Cryst, Trans.

Wissadula contracta (Link) R.E.Fr. **Habits:** herb(2); shrub(1); subshrub(1). **Life forms:** hemicryptophyte(1); therophyte(2). **States:** CE(3); PE(3). **Habitats:** Agre, Cryst, Sed, Trans.

MARANTACEAE (2 genera; 2 species)

Calathea (1 species)

Calathea villosa (Lodd.) Lindl. **Habits:** herb(2). **Life forms:** cryptophyte-geo(2). **States:** CE(2); PB(1). **Habitats:** Agre, Sed.

Maranta (1 species)

Maranta divaricata Roscoe **Life forms:** hemicryptophyte(1). **States:** PB(1). **Habitats:** Ins.

MARCGRAVIACEAE (1 genus; 1 species)

Schwartzia (1 species)

Schwartzia brasiliensis (Choisy) Bedell ex Gir.-Cañas [Synonyms: *Norantea brasiliensis* Choisy] **States:** PE(1). **Habitats:** Ins.

MELASTOMATACEAE (5 genera; 8 species)

Clidemia (1 species)

Clidemia hirta (L.) D.Don **Habits:** ?(1); shrub(1). **Life forms:** therophyte(2). **States:** PE(3); PI(1). **Habitats:** Ins, Sed, Trans.

Miconia (1 species)

Miconia albicans (Sw.) Triana **Habits:** tree(1). **States:** PI(1). **Habitats:** Trans.

Mouriri (1 species)

Mouriri pusa Gardner **Habits:** tree(1). **States:** BA(2). **Habitats:** Sed.

Pterolepis (2 species)

Pterolepis polygonoides (DC.) Triana **Life forms:** therophyte(1). **States:** PE(2). **Habitats:** Ins.

Pterolepis trichotoma (Rottb.) Cogn. **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Tibouchina (3 species)

Tibouchina heteromalla (D.Don) Cogn. [Synonyms: *Tibouchina grandifolia* Cogn.; *Tibouchina multiflora* (Gardner) Cogn.] **Habits:** shrub(1); subshrub(1). **Life forms:** phanerophyte(2). **States:** PB(1); PE(4). **Habitats:** Ins, Sed.

Tibouchina lithophila Wurdack **Life forms:** phanerophyte(1). **States:** BA(1). **Habitats:** Ins.

Tibouchina mutabilis (Vell.) Cogn. **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

MELIACEAE (3 genera; 5 species)

Cabralea (1 species)

Cabralea canjerana (Vell.) Mart. **States:** MG(2). **Habitats:** Arb.

Cedrela (2 species)

Cedrela fissilis Vell. **States:** MG(5). **Habitats:** Arb.

Cedrela odorata L. **Habits:** tree(1). **States:** CE(1); PE(2). **Habitats:** Agre, Unc.

Trichilia (2 species)

Trichilia elegans A.Juss. **Habits:** shrub(3). **Life forms:** phanerophyte(2). **States:** CE(4). **Habitats:** Sed.

Trichilia hirta L. [Synonyms: *Trichilia cathartica* Mart.] **Habits:** shrub(1). **States:** BA(1); MG(6); PI(1). **Habitats:** Arb, Ins, Trans.

MENISPERMACEAE (1 genus; 2 species)

Cissampelos (2 species)

Cissampelos andromorpha DC. **States:** BA(1). **Habitats:** Ins.

Cissampelos parriera Vell., An illegitimate name. This name should not be used anymore. **Habits:** ?(1). **States:** PE(1). **Habitats:** Riv.

MENYANTHACEAE (1 genus; 1 species)

Nymphoides (1 species)

Nymphoides indica (L.) Kuntze **States:** BA(1). **Habitats:** Aqua.

MOLLUGINACEAE (2 genera; 2 species)

Glischrothamnus (1 species)

Glischrothamnus ulei Pilg. **Habits:** subshrub(1). **States:** BA(1). **Habitats:** Sed.

Mollugo (1 species)

Mollugo verticillata L. **Habits:** herb(10). **Life forms:** therophyte(6). **States:** BA(2); CE(1); PB(3); PE(12); PI(1). **Habitats:** Aqua, Cryst, Ins, Riv, Sed, Trans.

MORACEAE (4 genera; 7 species)

Brosimum (1 species)

Brosimum gaudichaudii Trécul **Habits:** shrub(1); tree(3). **Life forms:** phanerophyte(1). **States:** CE(4); PI(5). **Habitats:** CMaior, Sed, Trans.

Dorstenia (1 species)

Dorstenia asaroides Gardner ex Hook. **States:** PE(1). **Habitats:** Agre.

Ficus (4 species)

Ficus arpazusa Casar. **States:** PB(1). **Habitats:** Agre.

Ficus christianii Carauta [Synonyms: *Ficus gameleira* Standl.] **States:** MG(1). **Habitats:** Arb.

Ficus cyclophylla (Miq.) Miq. **States:** BA(1). **Habitats:** Ins.

Ficus elliotiana S.Moore **States:** BA(1). **Habitats:** Ins.

Maclura (1 species)

Maclura tinctoria (L.) D.Don ex Steud. [Synonyms: *Chlorophora tinctoria* (L.) Gaudich.] **States:** BA(2); MG(5); PB(1). **Habitats:** Agre, Arb, Ins.

MYRSINACEAE (3 genera; 3 species)

Anagallis (1 species)

Anagallis minima E.H.L.Krause **Life forms:** therophyte(2). **States:** PE(2). **Habitats:** Ins.

Cybianthus (1 species)

Cybianthus penduliflorus Mart. **Habits:** ?(1). **States:** PI(1). **Habitats:** Trans.

Myrsine (1 species)

Myrsine guianensis (Aubl.) Kuntze **States:** PB(1). **Habitats:** Agre.

MYRTACEAE (6 genera; 42 species)

Campomanesia (6 species)

Campomanesia aromatica (Aubl.) Griseb. **Habits:** shrub(6); treelet(1). **Life forms:** microphanerophyte(1); phanerophyte(2). **States:** CE(5); PE(7). **Habitats:** Ins, Sed, Trans.

Campomanesia dichotoma (O.Berg) Mattos **States:** PB(1). **Habitats:** Agre.

Campomanesia eugenioides (Cambess.) D.Legrand **States:** BA(2); PE(1). **Habitats:** Ins.

Campomanesia pubescens (DC.) O.Berg **Habits:** shrub(1). **States:** CE(1). **Habitats:** Sed.

Campomanesia velutina (Cambess.) O.Berg **Habits:** shrub(1). **States:** CE(2). **Habitats:** Sed.

Campomanesia viatoris Landrum **Habits:** shrub(1). **States:** PE(1). **Habitats:** Trans.

Eugenia (19 species)

Eugenia aurata O.Berg **Habits:** shrub(1). **States:** CE(5). **Habitats:** Sed.

Eugenia azuruensis O.Berg **Life forms:** phanerophyte(1). **States:** PI(1). **Habitats:** Sed.

Eugenia biflora (L.) DC. **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

Eugenia candolleana DC. **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

Eugenia crenata Vell. **States:** BA(1). **Habitats:** Diam.

Eugenia dichroma O.Berg **Habits:** ?(1). **States:** PI(1). **Habitats:** Trans.

Eugenia dysenterica DC. **Habits:** shrub(1); tree(2). **Life forms:** phanerophyte(2). **States:** BA(1); CE(5). **Habitats:** Diam, Sed.

Eugenia flavescens DC. **Habits:** shrub(2); tree(2). **Life forms:** phanerophyte(3). **States:** CE(4); PE(1); PI(3). **Habitats:** Trans, Sed.

Eugenia florida DC. **States:** MG(9). **Habitats:** Arb.

Eugenia ligustrina (Sw.) Willd. **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Eugenia luschnathiana (O.Berg) Klotzsch ex B.D.Jacks. **Habits:** shrub(1). **States:** CE(1). **Habitats:** Sed.

Eugenia mansoi O.Berg **States:** BA(1). **Habitats:** Ins.

Eugenia pseudopsidium Jacq. **Habits:** shrub(1). **Life forms:** microphanerophyte(1). **States:** PE(3). **Habitats:** Sed.

Eugenia punicifolia (Kunth) DC. [Synonyms: *Eugenia ciarensis* O.Berg.; *Eugenia diantha* O.Berg; *Eugenia flava* O.Berg] **Habits:** shrub(6); tree(4). **Life forms:** microphanerophyte(1); phanerophyte(2). **States:** CE(7); PE(5); PI(5). **Habitats:** Sed, Trans.

Eugenia pyriformis Cambess. [Synonyms: *Eugenia uvalha* Cambess.; *Eugenia vauthiereana* O.Berg] **Habits:** shrub(2); tree(3). **Life forms:** phanerophyte(1). **States:** CE(2); PB(4); PE(2). **Habitats:** Agre, Riv, Sed.

Eugenia rosea DC. **States:** BA(2). **Habitats:** Ins.

Eugenia stictopetala DC. [Synonyms: *Eugenia piauhiensis* O.Berg; *Eugenia tapacumensis* O.Berg] **Habits:** ?(1); shrub(3); tree(4). **Life forms:** phanerophyte(3). **States:** CE(8); PE(2); PI(4). **Habitats:** Sed, Trans.

Eugenia uniflora L. **States:** MG(2). **Habitats:** Arb.

Eugenia vattimoana Mattos **States:** CE(1). **Habitats:** Sed.

Myrcia (6 species)

Myrcia aegiphiloides Mattos **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Myrcia guianensis (Aubl.) DC. [Synonyms: *Myrcia obtecta* (O.Berg) Kiaersk.] **Habits:** shrub(2). **Life forms:** phanerophyte(1). **States:** CE(3). **Habitats:** Sed.

Myrcia multiflora (Lam.) DC. **Habits:** shrub(2). **Life forms:** microphanerophyte(1); phanerophyte(1). **States:** CE(1); PE(3). **Habitats:** Sed.

Myrcia oblongata DC. **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Myrcia splendens (Sw.) DC. [Synonyms: *Myrcia acutata* O.Berg; *Myrcia acutiloba* O.Berg; *Myrcia alagoensis* O.Berg] **Habits:** ?(1). **States:** PB(1); PI(1). **Habitats:** Agre, Trans.

Myrcia tomentosa (Aubl.) DC. **Habits:** shrub(1). **States:** PB(1); PE(1). **Habitats:** Agre, Sed.

Myrciaria (1 species)

Myrciaria ferruginea O.Berg **Habits:** tree(2). **States:** PI(2). **Habitats:** Trans.

Plinia (1 species)

Plinia cauliflora (Mart.) Kausel [Synonyms: *Myrciaria cauliflora* (Mart.) O.Berg] **States:** PB(1). **Habitats:** Agre.

Psidium (9 species)

Psidium acutangulum DC. [Synonyms: *Psidium persoonii* McVaugh] **Habits:** shrub(2). **States:** PE(2). **Habitats:** Sed.

Psidium appendiculatum Kiaersk. **Habits:** shrub(1). **States:** BA(2); CE(1). **Habitats:** Ins, Sed.

Psidium guineense Sw. [Synonyms: *Psidium albidum* Miq.; *Psidium araca* Raddi] **States:** PB(1); PE(1). **Habitats:** Agre, Ins.

Psidium myrsinites DC. **Habits:** treelet(1). **States:** PI(3). **Habitats:** CMaior.

Psidium myrtoides O.Berg [Synonyms: *Psidium myrsinoides* O.Berg; *Psidium myrsinoides* O.Berg] **Habits:** shrub(3). **States:** PE(4). **Habitats:** Sed.

Psidium oligospermum DC. **States:** PB(1). **Habitats:** Agre.

Psidium riparium Mart. ex DC. **Habits:** shrub(1). **States:** PB(1); PE(1). **Habitats:** Agre, Sed.

Psidium salutare (Kunth) O.Berg [Synonyms: *Psidium luridum* (Spreng.) Burret] **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

Psidium sartorianum (O.Berg) Nied. **Habits:** shrub(1). **States:** CE(2). **Habitats:** Sed.

NYCTAGINACEAE (5 genera; 10 species)

Boerhavia (2 species)

Boerhavia coccinea Mill., A widespread ruderal species whose native status is uncertain, *Boerhavia coccinea* may in fact be an exotic species of unknown origin (C.F.C Sá, pers. comm.). **Habits:** herb(3). **Life forms:** hemicryptophyte(1); therophyte(2). **States:** CE(1); PE(3); RN(1). **Habitats:** Agre, Cryst, Trans.

Boerhavia diffusa L., A widespread ruderal species whose native status is uncertain, *Boerhavia diffusa* may in fact be an exotic species of unknown origin (C.F.C Sá, pers. comm.) **Habits:** herb(2). **Life**

forms: chamaephyte(1); therophyte(1). **States:** CE(1); PB(3); PE(1). **Habitats:** Cryst, Ins, Riv.

Bougainvillea (1 species)

Bougainvillea praecox Griseb. **States:** MG(3). **Habitats:** Arb.

Guapira (5 species)

Guapira campestris (Netto) Lundell [Synonyms: *Pisonia campestris* Netto] **Habits:** tree(1). **States:** PI(2). **Habitats:** Sed, Trans.

Guapira graciliflora (Mart. ex Schmidt) Lundell **Habits:** shrub(5); tree(1). **Life forms:** phanerophyte(3). **States:** BA(1); CE(10). **Habitats:** Cryst, Diam, Sed.

Guapira noxia (Netto) Lundell **Habits:** tree(4). **Life forms:** phanerophyte(1). **States:** PE(6); RN(1). **Habitats:** Agre, Cryst, Unc.

Guapira opposita (Vell.) Reitz [Synonyms: *Guapira laxiflora* (Choisy) Lundell; *Pisonia minor* Choisy] **States:** MG(3); PB(3); PE(1); RN(1). **Habitats:** Agre, Arb, Ins, Riv, Unc.

Guapira tomentosa (Casar.) Lundell [Synonyms: *Pisonia tomentosa* Casar.] **States:** BA(3); PE(2); RN(5). **Habitats:** Diam, Ins, Unc.

Neea (1 species)

Neea obovata Spruce ex Heimerl **Habits:** tree(1). **States:** CE(1). **Habitats:** Sed.

Pisonia (1 species)

Pisonia laxa Netto [Synonyms: *Guapira laxa* (Netto) Furlan, The name *Guapira laxa* (Netto) Furlan have been in use in many floristic surveys in Northeastern Brazil, but up to date it is a *nomen nudum*. A. Furlan died before publishing this name and left it invalid. Botanist A.M. Giulietti says she intends to validate this name, but up to date if one needs to cite this species one should use *Pisonia laxa* Netto until this name is validly put under *Guapira laxa*.] **Habits:** shrub(2); tree(11). **States:** CE(2); PB(4); PE(8); PI(2). **Habitats:** Agre, Cryst, Riv, Sed, Trans.

NYMPHAEACEAE (1 genus; 2 species)

Nymphaea (2 species)

Nymphaea amazonum Mart. & Zucc. **States:** BA(1). **Habitats:** Aqua.

Nymphaea ampla (Salisb.) DC. **States:** BA(6). **Habitats:** Aqua.

OCHNACEAE (1 genus; 5 species)

Ouratea (5 species)

Ouratea blanchetiana (Planch.) Engl. **Habits:** shrub(1). **Life forms:** nanophanerophyte(1). **States:** PE(3). **Habitats:** Sed.

Ouratea cearensis (Tiegh.) Sastre **Habits:** shrub(1); tree(1). **States:** CE(1); PI(1). **Habitats:** CMaior, Sed.

Ouratea discophora Ducke **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Ouratea glaucescens (A.St.-Hil.) Engl. **Habits:** tree(1). **States:** BA(2). **Habitats:** Sed.

Ouratea parvifolia (A.St.-Hil.) Engl. **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(2). **Habitats:** Sed.

OLACACEAE (1 genus; 2 species)

Ximenia (2 species)

Ximenia americana L. **Habits:** shrub(6); tree(5). **Life forms:** phanerophyte(2). **States:** BA(3); CE(4); PB(6); PE(1); PI(8); RN(3). **Habitats:** Agre, CMaior, Cryst, Diam, Riv, Sed, Trans, Unc.

Ximenia coriacea Engl. **States:** CE(2). **Habitats:** Cryst.

ONAGRACEAE (1 genus; 7 species)

Ludwigia (7 species)

Ludwigia affinis (DC.) H.Hara **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Riv.

Ludwigia erecta (L.) H.Hara **Habits:** herb(1); subshrub(1). **Life forms:** therophyte(1). **States:** BA(1); CE(1); PE(2). **Habitats:** Aqua, Cryst, Riv.

Ludwigia filiformis (Micheli) Ramamoorthy **States:** BA(2). **Habitats:** Aqua.

Ludwigia helminthorrhiza (Mart.) H.Hara **States:** BA(1). **Habitats:** Aqua.

Ludwigia hyssopifolia (G.Don) Exell **Habits:** herb(1). **States:** CE(1). **Habitats:** Trans.

Ludwigia inclinata (L.f.) M.Gómez **States:** BA(3). **Habitats:** Aqua.

Ludwigia leptocarpa (Nutt.) H.Hara **Life forms:** therophyte(1). **States:** BA(2); PE(1). **Habitats:** Aqua, Ins.

OPILIACEAE (1 genus; 1 species)

Agonandra (1 species)

Agonandra brasiliensis Miers ex Benth. & Hook.f. **Habits:** shrub(1); tree(3). **Life forms:** phanerophyte(3). **States:** CE(6); PI(5). **Habitats:** CMaior, Sed.

ORCHIDACEAE (17 genera; 34 species)

Acianthera (1 species)

Acianthera ochreata (Lindl.) Pridgeon & M.W.Chase [Synonyms: *Pleurothallis ochreata* Lindl.] **Life forms:** hemicryptophyte(1); phanerophyte(2). **States:** PB(1); PE(3). **Habitats:** Ins.

Brassavola (1 species)

Brassavola tuberculata Hook. **Habits:** rupicolous(1). **Life forms:** chamaephyte(1). **States:** BA(1); PB(1); PE(1). **Habitats:** Ins.

Campylocentrum (1 species)

Campylocentrum crassirhizum Hoehne **Life forms:** chamaephyte(2). **States:** PE(2). **Habitats:** Ins.

Catasetum (2 species)

Catasetum barbatum (Lindl.) Lindl. **Habits:** epiphyte(1). **Life forms:** cryptophyte-geo(1). **States:** PE(2). **Habitats:** Ins, Sed.

Catasetum uncatum Rolfe **States:** BA(2). **Habitats:** Ins.

Cattleya (1 species)

Cattleya aclandiae Lindl. **Life forms:** chamaephyte(1). **States:** BA(1). **Habitats:** Ins.

Cyrtopodium (7 species)

Cyrtopodium aliciae Lindl. & Rchb.f **Habits:** herb(1). **States:** PE(1). **Habitats:** Agre.

Cyrtopodium andersonii (Lamb. ex Andrews) R.Br. **States:** PB(1). **Habitats:** Agre.

Observations: According to specialist C. Van den Berg this record represents a misidentification and the species in question is probably *Cyrtopodium flavum* Link & Otto ex Rchb.f.

Cyrtopodium flavum Link & Otto ex Rchb.f. [Synonyms: *Cyrtopodium polyphyllum* (Vell.) Pabst ex F.Barros] **Life forms:** cryptophyte-geo(2). **States:** PE(3). **Habitats:** Ins.

Cyrtopodium gigas (Vell.) Hoehne **States:** BA(1). **Habitats:** Ins.

Observations: According to specialist C. Van den Berg this record represents a misidentification and the species in question is probably *Cyrtopodium saintlegerianum* Rchb.f.

Cyrtopodium holstii L.C.Menezes **Habits:** rupicolous(1). **States:** PB(1); PE(1). **Habitats:** Agre, Ins.

Cyrtopodium intermedium Brade **Habits:** herb(1). **States:** PE(2). **Habitats:** Ins, Sed.

Cyrtopodium poecilum Rchb.f. & Warm. **Life forms:** hemicryptophyte(1). **States:** PB(1). **Habitats:** Ins.

Encyclia (2 species)

Encyclia dichroma (Lindl.) Schltr. **Life forms:** chamaephyte(1). **States:** BA(2). **Habitats:** Ins.

Observations: According to specialist C. Van den Berg this record represents a misidentification and the species in question is probably *Encyclia ghillanyi* Pabst.

Encyclia oncidioides (Lindl.) Schltr. **States:** PE(1). **Habitats:** Ins.

Epidendrum (4 species)

Epidendrum cinnabarinum Salzm. **States:** PE(1). **Habitats:** Ins.

Epidendrum difforme Jacq. **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Epidendrum rigidum Jacq. **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Epidendrum secundum Jacq. **States:** PE(1). **Habitats:** Ins.

Habenaria (6 species)

Habenaria hexaptera Lindl. **Life forms:** chamaephyte(1). **States:** PB(1). **Habitats:** Ins.

Habenaria obtusa Lindl. **Life forms:** chamaephyte(1). **States:** PB(1); PE(1). **Habitats:** Ins.

Habenaria petalodes Lindl. **Life forms:** chamaephyte(1). **States:** PB(1). **Habitats:** Ins.

Habenaria pratensis (Salzm. ex Lindl.) Rchb.f. **Life forms:** cryptophyte-geo(2). **States:** PE(2). **Habitats:** Ins.

Habenaria repens Nutt. **States:** BA(3). **Habitats:** Aqua.

Habenaria trifida Kunth **Life forms:** cryptophyte-geo(1). **States:** PE(2). **Habitats:** Ins.

Oncidium (1 species)

Oncidium baueri Lindl. **Life forms:** cryptophyte-geo(1). **States:** PE(1). **Habitats:** Ins.

Polystachya (1 species)

Polystachya estrellensis Rchb.f. **Life forms:** cryptophyte-geo(2). **States:** PE(2). **Habitats:** Ins.

Prescottia (1 species)

Prescottia phleoides Lindl. **Life forms:** cryptophyte-geo(2); hemicryptophyte(1). **States:** PB(1); PE(2). **Habitats:** Ins.

Rodriguezia (1 species)

Rodriguezia bahiensis Rchb.f. **Life forms:** cryptophyte-geo(1). **States:** PE(1). **Habitats:** Ins.

Sarcoglottis (1 species)

Sarcoglottis acaulis (Sm.) Schltr. **States:** PE(1). **Habitats:** Agre.

Scaphyglottis (1 species)

Scaphyglottis fusiformis (Griseb.) Schultes **States:** PE(1). **Habitats:** Ins.

Sobralia (1 species)

Sobralia liliastrum Salzm. ex Lindl. **States:** PE(1). **Habitats:** Ins.

Vanilla (2 species)

Vanilla chamissonis Klotzsch **Habits:** climber(1). **States:** PE(1). **Habitats:** Agre.

Vanilla palmarum (Salzm. ex Lindl.) Lindl. **Habits:** epiphyte(1). **States:** BA(2); PE(1). **Habitats:** Ins, Sed.

OROBANCHACEAE (1 genus; 1 species)

Melasma (1 species)

Melasma melampyroides (Rich.) Pennell [Synonyms: *Alectra aspera* (Cham. & Schltdl.) L.O.Williams] **Life forms:** therophyte(1). **States:** BA(1); PE(1). **Habitats:** Aqua, Ins.

OXALIDACEAE (1 genus; 10 species)

Oxalis (10 species)

Oxalis cratensis Oliv. ex Hook. **Life forms:** therophyte(1). **States:** PE(2). **Habitats:** Ins, Trans.

Oxalis divaricata Mart. ex Zucc. [Synonyms: *Oxalis euphorbioides* A.St.-Hil.; *Oxalis noronhae* Oliv.] **Habits:** herb(3); subshrub(3). **Life forms:** chamaephyte(3); phanerophyte(1); therophyte(2). **States:** CE(3); PB(2); PE(3). **Habitats:** Agre, Cryst, Ins, Sed.

Oxalis eriocarpa DC. **Habits:** herb(1). **States:** PI(1). **Habitats:** Trans.

Oxalis frutescens L. **Habits:** subshrub(2). **Life forms:** chamaephyte(2). **States:** CE(2); PE(2). **Habitats:** Sed, Ins, Sed.

Oxalis glaucescens Norlind **Life forms:** therophyte. **States:** PE(2). **Habitats:** Trans.

Oxalis hedysarifolia Raddi **Life forms:** therophyte(1). **States:** PE(2). **Habitats:** Ins.

Oxalis psoraleoides Kunth **States:** BA(1); PE(1). **Habitats:** Diam, Trans.

Oxalis refracta A.St.-Hil. **States:** PB(1). **Habitats:** Agre.

Oxalis sepium A.St.-Hil. **Habits:** herb(1). **States:** PI(1). **Habitats:** Trans.

Oxalis triangularis A.St.-Hil. **Habits:** herb(1). **States:** CE(1). **Habitats:** Trans.

PASSIFLORACEAE (1 genus; 6 species)

Passiflora (6 species)

Passiflora alata Curtis **States:** PE(1). **Habitats:** Ins.

Passiflora cincinnata Mast. **Habits:** climber(2); liana(1). **Life forms:** liana(1); phanerophyte(1). **States:** BA(2); CE(1); PE(3); PI(1). **Habitats:** Ins, Sed, Trans.

Passiflora edmundoi Sacco **Life forms:** liana(1). **States:** PI(1). **Habitats:** Sed.

Passiflora foetida L. **Habits:** climber(4); liana(2). **Life forms:** chamaephyte(3); therophyte(2). **States:** BA(1); CE(3); PE(6); PI(1). **Habitats:** Cryst, Ins, Sed, Trans.

Passiflora galbana Mast. **Habits:** climber(1). **States:** PE(2). **Habitats:** Ins, Sed.

Passiflora luetzelburgii Harms **Habits:** climber(5). **States:** PB(1); PE(4). **Habitats:** Ins, Sed.

PHYLLANTHACEAE (2 genera; 7 species)

Flueggea (1 species)

Flueggea flexuosa Müll.Arg **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Phyllanthus (6 species)

Phyllanthus caroliniensis Walter **Habits:** herb(1). **Life forms:** therophyte(2). **States:** CE(2). **Habitats:** Cryst.

Phyllanthus chacoensis Morong **Habits:** tree(1). **States:** PE(1). **Habitats:** Riv.

Phyllanthus heteradenius Müll.Arg. **Habits:** herb(4). **Life forms:** therophyte(4). **States:** PE(5). **Habitats:** Cryst, Trans.

Phyllanthus niruri L. [Synonyms: *Phyllanthus lathyroides* Kunth] **Habits:** herb(5). **Life forms:** phanerophyte(1); therophyte(7). **States:** CE(1); PB(1); PE(10). **Habitats:** Agre, Cryst, Ins, Sed, Trans, Unc.

Phyllanthus orbiculatus Rich. **Habits:** herb(2). **Life forms:** therophyte(2). **States:** CE(3). **Habitats:** Cryst, Sed.

Phyllanthus tenellus Roxb. **States:** PB(1). **Habitats:** Cryst.

PHYTOLACCACEAE (2 genera; 6 species)

Microtea (5 species)

Microtea glochidiata Moq. **Life forms:** therophyte(1). **States:** PB(1). **Habitats:** Ins.

Microtea longebracteata H.Walter **States:** BA(1). **Habitats:** Aqua.

Microtea maypurensis (Kunth) G.Don **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Microtea paniculata Moq. **Habits:** herb(7). **Life forms:** therophyte(4). **States:** CE(1); PE(9). **Habitats:** Cryst, Ins, Sed, Trans.

Microtea scabrida Urb. **States:** PE(1). **Habitats:** Unc.

Rivina (1 species)

Rivina humilis L. [Synonyms: *Rivina brasiliensis* Nocca] **Habits:** herb(1). **Life forms:** phanerophyte(1). **States:** BA(1); PB(2); PE(1). **Habitats:** Agre, Ins, Riv.

PICRAMNIACEAE (1 genus; 2 species)

Picramnia (2 species)

Picramnia andrade-limae Pirani **States:** PB(1). **Habitats:** Agre.

Picramnia bahiensis Turcz. **Habits:** shrub(1). **States:** BA(1). **Habitats:** Diam.

PIPERACEAE (2 genera; 3 species)

Peperomia (2 species)

Peperomia blanda (Jacq.) Kunth **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Peperomia circinnata Link **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Piper (1 species)

Piper nigrum L. **States:** PE(1). **Habitats:** Ins.

PLANTAGINACEAE (6 genera; 13 species)

Angelonia (6 species)

Angelonia biflora Benth. **Habits:** herb(1). **Life forms:** hemicryptophyte(1). **States:** CE(2). **Habitats:** Cryst, Trans.

Angelonia blanchetii Benth. **Habits:** herb(1). **States:** BA(1). **Habitats:** Sed.

Angelonia campestris Nees & Mart. **Habits:** herb(1). **States:** BA(1); PE(1). **Habitats:** Ins, Riv.

Angelonia cornigera Hook.f. **Habits:** herb(5). **Life forms:** therophyte(3). **States:** CE(2); PE(4). **Habitats:** Sed, Trans.

Angelonia pubescens Benth. **Life forms:** therophyte(2). **States:** CE(1); PE(1). **Habitats:** Cryst, Ins.

Angelonia salicariifolia Bonpl. [Synonyms: *Angelonia gardneri* Hook.] **Habits:** herb(1). **States:** BA(1); PB(1); PE(2). **Habitats:** Agre, Aqua, Riv.

Bacopa (2 species)

Bacopa aquatica Aubl. **States:** BA(1). **Habitats:** Aqua.

Bacopa stricta (Schrad.) Wettst. ex Edwall **States:** BA(1). **Habitats:** Aqua.

Dizygostemon (1 species)

Dizygostemon floribundum (Benth.) Radlk. ex Wettst. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Scoparia (1 species)

Scoparia dulcis L. **Habits:** herb(1); subshrub(1). **Life forms:** chamaephyte(2); therophyte(1). **States:** BA(1); CE(2); PB(1); PI(1). **Habitats:** Aqua, Cryst, Ins, Trans.

Stemodia (2 species)

Stemodia maritima L. **Habits:** ?(1). **States:** PE(2). **Habitats:** Aqua, Riv.

Stemodia pratensis (Aubl.) C.C. Cowan, *Stemodia pratensis* does not occur in Brazil but the name has been misapplied to the caatinga species *Stemodia foliosa* Benth. (V.C. Souza, pers. comm.) **Life forms:** phanerophyte(1). **States:** BA(2). **Habitats:** Aqua, Ins.

Tetraulacium (1 species)

Tetraulacium veroniciforme Turcz. **Habits:** herb(2). **Life forms:** therophyte(2). **States:** PE(2); RN(1). **Habitats:** Trans, Unc.

PLUMBAGINACEAE (1 genus; 1 species)

Plumbago (1 species)

Plumbago scandens L. **Habits:** climber(1); herb(2); subshrub(3). **Life forms:** chamaephyte(1). **States:** BA(2); CE(2); PB(2); PE(5); PI(1). **Habitats:** Agre, Cryst, Ins, Riv, Sed, Trans.

POACEAE (33 genera; 61 species)

Andropogon (1 species)

Andropogon selloanus (Hack.) Hack. **States:** PE(1). **Habitats:** Ins.

Anthephora (1 species)

Anthephora hermaphrodita (L.) Kuntze **Life forms:** therophyte(1). **States:** BA(1); PE(1); RN(1). **Habitats:** Aqua, Ins, Unc.

Aristida (2 species)

Aristida elliptica (Nees) Kunth **States:** PE(1). **Habitats:** Cryst.

Aristida setifolia Kunth **Life forms:** therophyte(1). **States:** CE(1); PE(1); RN(3). **Habitats:** Cryst, Ins, Unc.

Axonopus (4 species)

Axonopus aureus P.Beauv. **States:** PE(1). **Habitats:** Ins.

Axonopus capillaris (Lam.) Chase **Habits:** herb(2). **Life forms:** therophyte(2). **States:** PE(2). **Habitats:** Trans.

Axonopus polydactylus (Steud.) Dedecca **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

Axonopus purpusii (Mez) Chase **States:** RN(1). **Habitats:** Unc.

Cenchrus (1 species)

Cenchrus brownii Roem. & Schult. **States:** PE(1). **Habitats:** Agre.

Chaetium (1 species)

Chaetium festucoides Nees **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Chloris (3 species)

Chloris barbata Sw. **States:** BA(2); PE(1). **Habitats:** Aqua.

Chloris exilis Renvoize **States:** BA(1). **Habitats:** Aqua.

Chloris orthonoton Döll **Life forms:** therophyte(1). **States:** PB(1). **Habitats:** Ins.

Cymbopogon (1 species)

Cymbopogon citratus (DC.) Stapf **Habits:** herb(1). **States:** PB(1). **Habitats:** Unc.

Cynodon (1 species)

Cynodon dactylon (L.) Pers. **Habits:** herb(1). **States:** PI(1). **Habitats:** Trans.

Dactyloctenium (1 species)

Dactyloctenium aegyptium (L.) Willd. **Habits:** herb(2). **Life forms:** therophyte(2). **States:** BA(1); PE(5); RN(2). **Habitats:** Agre, Aqua, Cryst, Ins, Trans, Unc.

Digitaria (3 species)

Digitaria ciliaris (Retz.) Koeler **Life forms:** therophyte(1). **States:** CE(1); PE(1). **Habitats:** Aqua, Ins.

Digitaria insularis (L.) Fedde **Life forms:** therophyte(1). **States:** PB(1). **Habitats:** Ins.

Digitaria sanguinalis (L.) Scop. **Habits:** herb(2). **Life forms:** therophyte(2). **States:** PE(2); RN(2). **Habitats:** Cryst, Trans, Unc.

Echinochloa (1 species)

Echinochloa colona (L.) Link **States:** BA(6). **Habitats:** Aqua.

Echinolaena (1 species)

Echinolaena inflexa (Poir.) Chase **States:** PE(1). **Habitats:** Ins.

Enteropogon (1 species)

Enteropogon mollis (Nees) Clayton [Synonyms: *Chloris rupestris* (Ridl.) Hitchc.; *Gymnopogon rupestris* Ridl.] **Habits:** herb(4). **Life forms:** cryptophyte-geo(1); therophyte(3). **States:** BA(1); PE(7). **Habitats:** Agre, Cryst, Ins, Trans, Unc.

Eragrostis (5 species)

Eragrostis acutiflora (Kunth) Nees **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Trans.

Eragrostis ciliaris (L.) R.Br. **Habits:** herb(4). **Life forms:** therophyte(3). **States:** CE(1); PE(4). **Habitats:** Cryst, Trans, Unc.

Eragrostis rufescens Schrad. ex Schult. **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Eragrostis tenella (L.) P.Beauv. ex Roem. & Schult. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Trans.

Eragrostis unioloides (Retz.) Nees ex Steud. **Habits:** herb(2). **Life forms:** therophyte(2). **States:** PE(2). **Habitats:** Trans.

Hymenachne (1 species)

Hymenachne amplexicaulis (Rudge) Nees
States: BA(4). **Habitats:** Aqua.

Ichnanthus (2 species)

Ichnanthus bambusiflorus (Trin.) Döll **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Ichnanthus dasycoleus Tutin **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Lasiacis (2 species)

Lasiacis anomala Hitchc. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Lasiacis ligulata Hitchc. & Chase **Life forms:** therophyte(1). **States:** PB(1); PE(1). **Habitats:** Agre, Ins.

Leptochloa (2 species)

Leptochloa fusca subsp. ***fascicularis*** (Lam.) N.Snow [Synonyms: *Leptochloa fascicularis* (Lam.) A.Gray] **States:** BA(1); PE(1). **Habitats:** Aqua.

Leptochloa panicea subsp. ***brachiata*** (Steud.) N.Snow [Synonyms: *Leptochloa filiformis* (Pers.) P. Beauv., Apparently an exotic grass species, or perhaps a misidentification of a native grass species.] **Habits:** herb(2). **Life forms:** hemicryptophyte(1); therophyte(1). **States:** PE(2). **Habitats:** Cryst.

Luziola (1 species)

Luziola brasiliana Moric. **States:** BA(1). **Habitats:** Aqua.

Panicum (4 species)

Panicum polygonatum Schrad. [Synonyms: *Panicum boliviense* Schrad.] **States:** BA(4). **Habitats:** Aqua.

Panicum sellowii Nees **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Panicum trichoides Sw. **Habits:** herb(7). **Life forms:** hemicryptophyte(1); therophyte(9). **States:** CE(5); PE(10); RN(1). **Habitats:** Agre, Cryst, Ins, Sed, Trans, Unc.

Panicum venezuelae Hack. **States:** PE(1). **Habitats:** Agre.

Pappophorum (1 species)

Pappophorum pappiferum (Lam.) Kuntze
States: BA(2). **Habitats:** Ins.

Paspalidium (1 species)

Paspalidium geminatum (Forssk.) Stapf **States:** BA(1); PE(1). **Habitats:** Aqua.

Paspalum (8 species)

Paspalum conjugatum P.J.Bergius **States:** PE(1). **Habitats:** Ins.

Paspalum fimbriatum Kunth **Habits:** herb(2). **Life forms:** therophyte(2). **States:** PE(4). **Habitats:** Cryst.

Paspalum melanospermum Desv. ex Poir. [Synonyms: *Paspalum foveolatum* Steud.] **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Paspalum oligostachyum Salzm. ex Steud. **States:** PE(1). **Habitats:** Ins.

Paspalum parviflorum Rhode ex Flüggé **States:** PE(1). **Habitats:** Ins.

Paspalum plicatulum Michx. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

Paspalum repens P.J.Bergius **States:** BA(3). **Habitats:** Aqua.

Paspalum scutatum Nees ex Trin. **Life forms:** therophyte(1). **States:** CE(1); PE(2); RN(1). **Habitats:** Cryst, Unc.

Sacciolepis (1 species)

Sacciolepis vilvoides (Trin.) Chase **States:** PE(1). **Habitats:** Ins.

Schizachyrium (1 species)

Schizachyrium brevifolium (Sw.) Nees ex Buse **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Setaria (4 species)

Setaria parviflora (Poir.) Kerguélen [Synonyms: *Setaria geniculata* (Lam.) P.Beauv.] **Habits:** herb(2). **Life forms:** therophyte(2). **States:** CE(1); PB(1); PE(3); RN(1). **Habitats:** Cryst, Ins, Sed, Unc, Sed.

Setaria pauciflora Linden ex Herrm., The use of *Setaria pauciflora* for plants of the semiarid of Brazil is almost certainly a misapplication of the name but the true identity of the material thus determined has not yet been established (R.S. Rodrigues, pers. comm.) **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Setaria setosa (Sw.) P.Beauv. [Synonyms: *Setaria rariflora* J.C.Mikan ex Trin.] **Habits:** herb(2). **Life forms:** therophyte(1). **States:** BA(1); CE(2). **Habitats:** Sed, Ins.

Setaria tenax (Rich.) Desv. **Habits:** herb(2). **Life forms:** therophyte(1). **States:** CE(1); PE(1). **Habitats:** Cryst, Sed.

Sporobolus (1 species)

Sporobolus pyramidatus (Lam.) Hitchc. **Life forms:** therophyte(1). **States:** PB(1); PE(1). **Habitats:** Ins.

Steirachne (1 species)

Steirachne diandra Ekman **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Sed.

Streptostachys (1 species)

Streptostachys asperifolia Desv. [Synonyms: *Panicum asperifolium* (Desv.) Hitchc.] **Habits:** herb(4). **Life forms:** therophyte(2). **States:** CE(4); PE(1). **Habitats:** Sed.

Trachypogon (1 species)

Trachypogon spicatus (L.f.) Kuntze **States:** PE(1). **Habitats:** Ins.

Tragus (1 species)

Tragus berteronianus Schult. **Habits:** herb(5). **Life forms:** hemicryptophyte(1); therophyte(3). **States:** PE(9). **Habitats:** Cryst, Ins, Sed, Trans.

Tripogon (1 species)

Tripogon spicatus (Nees) Ekman **Habits:** herb(2). **Life forms:** therophyte(2). **States:** PE(2). **Habitats:** Cryst.

POLYGALACEAE (4 genera; 18 species)

Bredemeyera (3 species)

Bredemeyera brevifolia (Benth.) Klotzsch ex A.W.Benn. **Habits:** climber(1). **States:** CE(3). **Habitats:** Sed.

Bredemeyera floribunda Willd. **Habits:** climber(1); liana(2). **Life forms:** phanerophyte(2). **States:** CE(4); PI(1). **Habitats:** CMaior, Sed.

Bredemeyera kunthiana (A.St.-Hil.) Klotzsch ex A.W.Benn. **Habits:** shrub(1). **States:** BA(1). **Habitats:** Diam.

Monnina (1 species)

Monnina insignis A.W.Benn. **States:** BA(1). **Habitats:** Sed.

Polygala (12 species)

Polygala bracteata A.W.Benn. **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Cryst.

Observations: According to specialist J.F.Pastore, *P. bracteata* is endemic to Goiás state. This record probably represents a misidentification.

Polygala galioides Poir. **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

Polygala glochidiata Kunth **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Polygala gracilis Kunth **Habits:** herb(1). **Life forms:** therophyte(2). **States:** CE(1); PB(1). **Habitats:** Ins, Sed.

Observations: According to specialist J.F.Pastore, this record probably represents a misidentification of *Polygala boliviensis* A.W.Benn.

Polygala lancifolia A.St.-Hil. & Moq. **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.
Observations: According to specialist J.F.Pastore, *P. lancifolia* is a species characteristic of the Atlantic rainforest and does not occur in the Caatinga.

Polygala longicaulis Kunth **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

Polygala mollis Kunth **Habits:** herb(1). **States:** BA(1). **Habitats:** Sed.

Observations: This taxon was subsequently recognised as distinct from *Polygala* and given the new combination *Asemeia mollis* (Kunth) J.F.B.Pastore & J.R.Abbott**. However, according to specialist J.F.Pastore the record of *P. mollis* probably represents a misidentification of *Asemeia ovata* (Poir.) J.F.B. Pastore & Abbott (=*Polygala ovata* Poir.).**

Polygala paniculata L. **Habits:** herb(2). **Life forms:** therophyte(3). **States:** CE(2); PB(1); PE(3). **Habitats:** Agre, Cryst, Ins, Sed.

Polygala pseudohebeclada Chodat **States:** BA(1). **Habitats:** Sed.

Observations: This taxon was subsequently recognised as distinct from *Polygala* and given the new combination *Asemeia pseudohebeclada* (Chodat) J.F.B.Pastore & J.R.Abbott.

Polygala roubienna A.St.-Hil. & Moq. **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

Observations: According to specialist J.F.Pastore, *P. roubienna* is a species endemic to the Serra dos Órgãos mountains in SE Brazil and its use in Caatinga almost certainly represents a misidentification.

Polygala spectabilis DC. **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Observations: Subsequently recognised as distinct from *Polygala* and given the new combination *Caamembeca spectabilis* (DC.) J.F.B.Pastore**.**

Polygala violacea Aubl. [Synonyms: *Polygala brizoides* A. St.-Hil. & Moq.] **Habits:** herb(2). **Life forms:** therophyte(3). **States:** CE(1); PB(1); PE(4); PI(1). **Habitats:** Trans, Cryst, Ins, Unc.

Observations: Subsequently recognised as distinct from *Polygala* and given the new combination *Asemeia violacea* (Aubl.) J.F.B.Pastore & J.R.Abbott.

Securidaca (2 species)

Securidaca diversifolia (L.) S.F.Blake **Life forms:** phanerophyte(1). **States:** BA(2); PE(1). **Habitats:** Ins.

Securidaca volubilis L. **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

POLYGONACEAE (4 genera; 10 species)

Coccoloba (3 species)

Coccoloba conduplicata Maguire **Habits:** tree(1). **States:** BA(1). **Habitats:** Diam.

Coccoloba mollis Casar. **States:** PB(1). **Habitats:** Agre.

Coccoloba schwackeana Lindau **Life forms:** phanerophyte(1). **States:** BA(3); MG(4). **Habitats:** Arb, Ins.

Polygonum (2 species)

Polygonum ferrugineum Wedd. **States:** BA(6). **Habitats:** Aqua.

Polygonum hispidum Kunth **Habits:** subshrub(1). **States:** BA(2); PE(1). **Habitats:** Aqua, Riv.

Ruprechtia (2 species)

Ruprechtia laxiflora Meisn. **Habits:** tree(1). **States:** BA(2); PE(3). **Habitats:** Cryst, Ins, Sed.

Ruprechtia ramiflora (Jacq.) C.A.Mey. **Habits:** tree(1). **States:** BA(2). **Habitats:** Sed.

Triplaris (3 species)

Triplaris gardneriana Wedd. [Synonyms: *Triplaris pachau* Mart.; *Triplaris tomentosa* Wedd.] **Habits:** ?(1); tree(6). **States:** BA(1); CE(1); MG(1); PB(5); PE(2); PI(1); RN(1). **Habitats:** Arb, Cryst, Diam, Riv, Trans, Unc.

Triplaris physocalyx Brandbyge **States:** BA(1). **Habitats:** Diam.

Triplaris weigeltiana (Rchb.) Kuntze [Synonyms: *Triplaris surinamensis* Cham.] **States:** PI(1). **Habitats:** CMaior.

PONTEDERIACEAE (2 genera; 4 species)

Eichhornia (3 species)

Eichhornia azurea (Sw.) Kunth **States:** BA(3). **Habitats:** Aqua.

Eichhornia crassipes (Mart.) Solms **States:** BA(6); PE(2). **Habitats:** Aqua.

Eichhornia paniculata (Spreng.) Solms **Life forms:** therophyte(1). **States:** BA(3); PB(1). **Habitats:** Aqua, Ins.

Heteranthera (1 species)

Heteranthera limosa (Sw.) Willd. **Habits:** herb(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Cryst.

PORTULACACEAE (2 genera; 10 species)

Portulaca (8 species)

Portulaca elatior Mart. ex Rohrb. **Habits:** herb(1). **Life forms:** therophyte(2). **States:** BA(2); PE(13); PI(1). **Habitats:** Cryst, Ins, Cryst, Ins, Riv, Sed, Trans.

Portulaca grandiflora Hook. **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

Portulaca halimoides L. **Life forms:** hemicryptophyte(2); phanerophyte(1). **States:** BA(4); CE(2); PB(1). **Habitats:** Cryst, Ins.

Portulaca hirsutissima Cambess. **States:** BA(1); PE(1). **Habitats:** Ins, Sed.

Portulaca mucronata Link [Synonyms: *Portulaca marginata* Kunth] **Habits:** herb(3). **Life forms:** therophyte(2). **States:** BA(2); PE(3). **Habitats:** Aqua, Ins, Trans.

Portulaca oleracea L. **Habits:** herb(4). **Life forms:** hemicryptophyte(1); therophyte(3). **States:** PE(8). **Habitats:** Agre, Cryst, Trans, Unc.

Portulaca pilosa L. **Habits:** herb(2). **Life forms:** therophyte(2). **States:** CE(1); PB(1); PI(1). **Habitats:** Cryst, Ins, Sed.

Portulaca umbraticola Kunth **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Trans.

Talinum (2 species)

Talinum paniculatum (Jacq.) Gaertn. **Habits:** herb(2). **Life forms:** therophyte(4). **States:** BA(1); CE(2); PB(1); PE(2). **Habitats:** Agre, Cryst, Ins, Sed.

Talinum triangulare (Jacq.) Willd. **Habits:** herb(4). **Life forms:** therophyte(3). **States:** CE(2); PB(2); PE(2). **Habitats:** Agre, Cryst, Ins, Sed, Trans.

RANUNCULACEAE (1 genus; 1 species)

Clematis (1 species)

Clematis dioica L. **Habits:** climber(1). **States:** PB(1). **Habitats:** Ins.

RHAMNACEAE (6 genera; 10 species)

Alvimiantha (1 species)

Alvimiantha tricamerata Grey-Wilson **States:** PB(1). **Habitats:** Cryst.

Colubrina (2 species)

Colubrina cordifolia Reissek **Habits:** shrub(6). **Life forms:** phanerophyte(2). **States:** CE(8); PI(3). **Habitats:** Sed, Trans.

Colubrina glandulosa Perkins **Habits:** tree(1). **States:** PI(1). **Habitats:** Sed.

Crumenaria (1 species)

Crumenaria decumbens Mart. **Habits:** herb(1). **Life forms:** therophyte(4). **States:** CE(2); PB(2); PE(1); RN(1). **Habitats:** Cryst, Ins, Trans.

Gouania (2 species)

Gouania colurnifolia Reissek **States:** PE(1). **Habitats:** Ins.

Gouania lupuloides (L.) Urb. **Habits:** climber(1). **States:** PE(1). **Habitats:** Agre.

Rhamnidium (2 species)

Rhamnidium elaeocarpum Reissek **States:** MG(1). **Habitats:** Arb.

Rhamnidium molle Reissek **Habits:** tree(3). **States:** PB(5); PE(4). **Habitats:** Agre, Cryst, Ins, Riv.

Ziziphus (2 species)

Ziziphus cotinifolia Reissek **Habits:** tree(4). **Life forms:** phanerophyte(1). **States:** CE(1); PB(4); PE(1); PI(2). **Habitats:** CMaior, Cryst, Riv, Sed, Trans.

Ziziphus joazeiro Mart. **Habits:** tree(13). **Life forms:** phanerophyte(3). **States:** BA(4); CE(4); MG(1); PB(19); PE(16); PI(1); RN(5). **Habitats:** Agre, Arb, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

RUBIACEAE (24 genera; 51 species)

Alibertia (2 species)

Alibertia edulis (Rich.) A.Rich. **Habits:** treelet(1). **Life forms:** phanerophyte(1). **States:** PI(4). **Habitats:** CMaior, Sed.

Alibertia macrantha Standl. **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Alseis (1 species)

Alseis floribunda Schott **Habits:** tree(3). **States:** BA(2); PE(2). **Habitats:** Agre, Diam.

Borreria (6 species)

Borreria alata (Aubl.) DC. [Synonyms: *Spermacoce alata* Aubl.] **Life forms:** therophyte(2). **States:** PE(2). **Habitats:** Ins.

Borreria brownii (Rusby) Standl. [Synonyms: *Spermacoce vegeta* (Standl. & Steyerm.) C.D.Adams ex W.C.Burger & C.M.Taylor] **Habits:** herb(1). **Life forms:** hemicryptophyte(1); therophyte(1). **States:** CE(2). **Habitats:** Cryst, Sed.

Borreria capitata (Ruiz & Pav.) DC. [Synonyms: *Spermacoce capitata* Ruiz & Pav.] **Habits:** herb(1). **Life forms:** therophyte(1). **States:** CE(1); PB(1); PE(1). **Habitats:** Cryst, Ins, Sed.

Borreria ocymoides (Burm.f.) DC. **States:** PE(1). **Habitats:** Unc.

Borreria scabiosoides Cham. & Schltdl. [Synonyms: *Spermacoce scabiosoides* (Cham. & Schltdl.) Kuntze] **Life forms:** therophyte. **States:** CE(1); PE(1). **Habitats:** Trans.

Borreria verticillata (L.) G.Mey. [Synonyms: *Spermacoce verticillata* L.] **Habits:** subshrub(1). **Life forms:** therophyte(1). **States:** BA(3); PB(2). **Habitats:** Agre, Aqua, Ins, Sed.

Chiococca (1 species)

Chiococca alba (L.) Hitchc. **States:** PB(1); PE(1). **Habitats:** Agre, Ins.

Chomelia (2 species)

Chomelia martiana Müll.Arg. **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Chomelia obtusa Cham. & Schltdl. **Habits:** shrub(3). **States:** CE(2); PI(4). **Habitats:** CMaior, Sed.

Cordiera (4 species)

Cordiera concolor (Cham.) Kuntze [Synonyms: *Alibertia concolor* (Cham.) K.Schum.] **Habits:** shrub(1). **States:** BA(2); PE(1). **Habitats:** Ins, Sed.

Cordiera elliptica (Cham.) Kuntze [Synonyms: *Alibertia elliptica* (Cham.) K.Schum.] **States:** PI(1). **Habitats:** Sed.

Cordiera rigida (K.Schum.) Kuntze [Synonyms: *Alibertia rigida* K.Schum.] **Habits:** subshrub(1). **States:** PE(2). **Habitats:** Ins, Sed.

Cordiera sessilis (Vell.) Kuntze [Synonyms: *Alibertia sessilis* (Vell.) K.Schum.] **Habits:** subshrub(1). **States:** BA(2); CE(1). **Habitats:** Ins, Sed.

Coutarea (1 species)

Coutarea hexandra (Jacq.) K.Schum. **Habits:** shrub(1); tree(3). **Life forms:** microphanerophyte(1); phanerophyte(1). **States:** BA(2); MG(3); PB(4); PE(7); PI(3). **Habitats:** Agre, Arb, CMaior, Cryst, Diam, Ins, Riv, Sed, Unc.

Declieuxia (1 species)

Declieuxia fruticosa (Willd. ex Roem. & Schult.) Kuntze **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Diodella (4 species)

Diodella apiculata (Willd. ex Roem. & Schult.) Delprete [Synonyms: *Diodia apiculata* (Willd. ex Roem. & Schult.) K. Schum.; *Diodia rigida* Cham. & Schltdl.] **Habits:** herb(4); subshrub(1). **Life forms:** chamaephyte(1); hemicryptophyte(1); therophyte(2). **States:** CE(2); PE(7). **Habitats:** Ins, Cryst, Sed, Trans.

Diodella gardneri (K.Schum.) Bacigalupo & E.L.Cabral [Synonyms: *Diodia barbeyana* Huber] **Habits:** herb(2). **Life forms:** therophyte(2). **States:** BA(1); CE(2). **Habitats:** Sed.

Diodella radula (Willd. ex Roem. & Schult.) Delprete [Synonyms: *Diodia radula* (Willd. ex Roem. & Schult.) Cham. & Schltdl.] **States:** PE(1). **Habitats:** Ins.

Diodella teres (Walter) Small [Synonyms: *Diodia prostrata* Sw.; *Diodia teres* Walter] **Habits:** herb(3). **Life forms:** therophyte(1). **States:** CE(2); PE(3); PI(1). **Habitats:** Cryst, Sed, Trans, Unc.

Emmeorhiza (1 species)

Emmeorhiza umbellata (Spreng.) K.Schum. **Life forms:** phanerophyte(2). **States:** PE(2). **Habitats:** Ins.

Faramea (1 species)

Faramea montevidensis (Cham. & Schltdl.) DC. **States:** BA(1). **Habitats:** Ins.

Genipa (1 species)

Genipa americana L. **States:** PB(1). **Habitats:** Cryst.

Guettarda (4 species)

Guettarda angelica Mart. ex Müll.Arg. **Habits:** shrub(5); tree(1). **States:** BA(2); MG(2); PB(4); PE(3); PI(1). **Habitats:** Arb, Cryst, Ins, Riv, Sed, Trans.

Guettarda platypoda DC. **Habits:** shrub(1). **States:** BA(1); PB(3); PE(1). **Habitats:** Agre, Diam, Ins, Riv.

Guettarda sericea Müll.Arg. **Habits:** shrub(1). **States:** PB(4). **Habitats:** Agre, Ins.

Guettarda viburnoides Cham. & Schltdl. **Habits:** shrub(2); treelet(1). **Life forms:** phanerophyte(1). **States:** CE(2); PI(4). **Habitats:** CMaior, Sed.

Leptoscela (1 species)

Leptoscela ruellioides Hook.f. **Habits:** herb(1). **Life forms:** phanerophyte(1). **States:** BA(2); PB(1); PE(1). **Habitats:** Cryst, Ins, Sed.

Machaonia (1 species)

Machaonia spinosa Cham. & Schltdl. **Habits:** shrub(1). **States:** PE(1). **Habitats:** Riv.

Manettia (1 species)

Manettia cordifolia Mart. **Habits:** climber(1). **Life forms:** phanerophyte(1). **States:** PB(2); PE(1). **Habitats:** Agre, Ins.

Margaritopsis (2 species)

Margaritopsis carrascoana (Delprete & E.B.Souza) C.M.Taylor **Habits:** subshrub(2). **Life forms:** chamaephyte(2). **States:** CE(2). **Habitats:** Sed.

Margaritopsis chaenotricha (DC.) C.M.Taylor [Synonyms: *Psychotria chaenotricha* DC.] **States:** PB(1). **Habitats:** Agre.

Mitracarpus (5 species)

Mitracarpus frigidus (Willd. ex Roem. & Schult.) K.Schum. **Life forms:** chamaephyte(2). **States:** PE(3). **Habitats:** Ins, Unc.

Mitracarpus hirtus (L.) DC. [Synonyms: *Mitracarpus villosus* (Sw.) DC.] **Habits:** herb(1). **Life forms:** therophyte(1). **States:** BA(1); CE(1); PE(1). **Habitats:** Cryst, Sed.

Mitracarpus parvulus K.Schum. **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

Mitracarpus salzmannianus DC. [Synonyms: *Mitracarpus scabrellus* Benth.] **Habits:** herb(3). **Life forms:** therophyte(3). **States:** PE(5). **Habitats:** Cryst, Trans.

Mitracarpus scaberulus Urb. **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Ins.

Palicourea (1 species)

Palicourea marcgravii A.St.-Hil. **States:** RN(1). **Habitats:** Unc.

Randia (2 species)

Randia armata (Sw.) DC. [Synonyms: *Basanacantha spinosa* var. *pubescens* (Kunth) K.Schum.; *Basanacantha spinosa* (Jacq.) K.Schum.; *Randia nitida* (Kunth) DC.] **Habits:** shrub(2); subshrub(1); tree(2). **Life forms:** phanerophyte(1). **States:** BA(3); CE(2); MG(9); PB(2); PE(3); PI(1); RN(1). **Habitats:** Agre, Arb, CMaior, Diam, Ins, Riv, Sed, Trans, Unc.

Randia ferox (Cham. & Schltdl.) DC. **Habits:** tree(1). **States:** PB(1). **Habitats:** Riv.

Richardia (3 species)

Richardia brasiliensis Gomes **Habits:** herb(1). **States:** PE(1). **Habitats:** Sed.

Richardia grandiflora (Cham. & Schltdl.) Steud. **Habits:** herb(6); subshrub(2). **Life forms:** chamaephyte(2); therophyte(2). **States:** CE(2); PB(2); PE(6); RN(2). **Habitats:** Agre, Aqua, Cryst, Ins, Sed, Trans, Unc.

Richardia scabra L. **Life forms:** hemicryptophyte(1). **States:** PI(1). **Habitats:** Sed.

Spermacoce (1 species)

Spermacoce spiralis (K.Schum.) Bacigalupo & E.L.Cabral **Habits:** herb(1). **Life forms:** hemicryptophyte(1). **States:** CE(1). **Habitats:** Cryst.

Staelia (2 species)

Staelia aurea K.Schum. **Habits:** subshrub(1). **States:** PE(1). **Habitats:** Sed.

Staelia virgata (Link ex Roem. & Schult.) K.Schum. **Life forms:** therophyte(1). **States:** CE(1); PE(3). **Habitats:** Cryst, Trans.

Tocoyena (3 species)

Tocoyena formosa (Cham. & Schltdl.) K.Schum. [Synonyms: *Tocoyena formosa* (Cham. & Schltdl.) K.Schum. subsp. *formosa*] **Habits:** shrub(5); tree(5). **Life forms:** phanerophyte(4). **States:** BA(2); CE(4); PB(10); PE(6); PI(2). **Habitats:** Agre, Cryst, Ins, Riv, Sed, Trans, Sed.

Tocoyena hispidula Standl. **Habits:** shrub(1). **States:** PI(2). **Habitats:** CMaior.

Tocoyena sellowiana (Cham. & Schltdl.) K.Schum. **Habits:** tree(3). **States:** PB(3); PI(1). **Habitats:** CMaior, Riv.

RUTACEAE (5 genera; 12 species)

Balfourodendron (1 species)

Balfourodendron molle (Miq.) Pirani [Synonyms: *Esenbeckia mollis* Miq.] **Habits:** shrub(2); tree(2). **States:** BA(2); MG(2); PE(4). **Habitats:** Arb, Diam, Sed.

Esenbeckia (1 species)

Esenbeckia febrifuga (A.St.-Hil.) A. Juss. ex Mart. **Life forms:** phanerophyte(2). **States:** PE(2). **Habitats:** Ins.

Galipea (1 species)

Galipea trifoliata Aubl. **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(2). **Habitats:** Sed.

Pilocarpus (2 species)

Pilocarpus jaborandi Holmes **Habits:** tree(2). **States:** PI(3). **Habitats:** Sed, Trans.

Pilocarpus spicatus A.St.-Hil. **Habits:** tree(1); treelet(1). **Life forms:** phanerophyte(1). **States:** CE(2). **Habitats:** Sed, Trans.

Zanthoxylum (7 species)

Zanthoxylum fagara (L.) Sarg. [Synonyms: *Zanthoxylum hyemale* A.St.-Hil.] **States:** PB(1). **Habitats:** Riv.

Zanthoxylum hamadryadicum Pirani **Habits:** shrub(1); tree(3). **States:** CE(2); PI(2). **Habitats:** Sed, Trans.

Zanthoxylum huberi P.G.Waterman **States:** PB(1). **Habitats:** Riv.

Zanthoxylum petiolare A.St.-Hil. & Tul. **States:** PB(1). **Habitats:** Agre.

Zanthoxylum rhoifolium Lam. [Synonyms: *Fagara rhoifolia* (Lam.) Engl.] **Life forms:** phanerophyte(2). **States:** BA(2); PB(1); PE(2); PI(1). **Habitats:** Agre, Cryst, Ins, Sed.

Zanthoxylum riedelianum Engl. **States:** MG(4). **Habitats:** Arb.

Zanthoxylum stelligerum Turcz. **Habits:** shrub(5); tree(2). **Life forms:** nanophanerophyte(1); phanerophyte(2). **States:** CE(3); PE(5); PI(4). **Habitats:** Sed, Trans.

SALICACEAE (3 genera; 12 species)

Casearia (10 species)

Casearia aculeata Jacq. [Synonyms: *Casearia ramiflora* Vahl] **States:** PB(1). **Habitats:** Agre.

Casearia commersoniana Cambess. **Habits:** shrub(1). **States:** CE(1). **Habitats:** Sed.

Casearia decandra Jacq. **States:** PB(1). **Habitats:** Agre.

Casearia eichleriana Sleumer **States:** PI(1). **Habitats:** Sed.

Casearia grandiflora Cambess. **Habits:** tree(1). **States:** PI(1). **Habitats:** Trans.

Casearia guianensis (Aubl.) Urb. **States:** PB(3). **Habitats:** Riv.

Casearia luetzelburgii Sleumer **States:** BA(1). **Habitats:** Ins.

Casearia resinifera Spruce ex Eichler **States:** PB(1). **Habitats:** Agre.

Casearia sylvestris Sw. **Habits:** shrub(2). **Life forms:** phanerophyte(1). **States:** CE(2); PE(3). **Habitats:** Ins, Sed.

Casearia ulmifolia Vahl ex Vent. **Habits:** shrub(1). **States:** PI(4). **Habitats:** CMaior.

Prockia (1 species)

Prockia crucis P.Browne ex L. **Life forms:** phanerophyte. **States:** PB(2); PE(3). **Habitats:** Agre, Cryst, Riv, Sed.

Xylosma (1 species)

Xylosma ciliatifolia (Clos) Eichler **Habits:** shrub(1); tree(2). **Life forms:** phanerophyte(2). **States:** CE(5). **Habitats:** Sed.

SANTALACEAE (1 genus; 6 species)

Phoradendron (6 species)

Phoradendron linearifolium Eichler **Habits:** hemiparasite(1). **States:** BA(1). **Habitats:** Sed.

Phoradendron mucronatum (DC.) Krug & Urb. **Habits:** hemiparasite(1). **States:** PE(1). **Habitats:** Riv.

Phoradendron piperoides (Kunth) Trel. **Habits:** epiphyte(1). **States:** PE(1). **Habitats:** Sed.

Phoradendron quadrangulare (Kunth) Griseb. [Synonyms: *Phoradendron piauhyanum* Trel.] **Habits:** hemiparasite(1). **States:** PB(1); PE(2). **Habitats:** Agre, Ins, Sed.

Phoradendron rubrum (L.) Griseb. **States:** BA(1). **Habitats:** Sed.

Phoradendron tunaeforme (DC.) Eichler **Habits:** hemiparasite(1). **States:** PE(1). **Habitats:** Sed.

SAPINDACEAE (13 genera; 31 species)

Allophylus (5 species)

Allophylus edulis (A.St.-Hil. et al.) Hieron. ex Niederl. **Habits:** tree(1). **States:** MG(3); PI(1). **Habitats:** Trans, Arb.

Allophylus laevigatus (Turcz.) Radlk. **States:** PB(2). **Habitats:** Agre.

Allophylus quercifolius (Mart.) Radlk. **Habits:** tree(9). **States:** PB(5); PE(10). **Habitats:** Agre, Cryst, Riv, Sed, Trans.

Allophylus racemosus Sw. **States:** MG(1). **Habitats:** Arb.

Allophylus sericeus (Cambess.) Radlk. **Habits:** shrub(1); tree(1). **Life forms:** phanerophyte(1). **States:** CE(5). **Habitats:** Sed.

Averrhoidium (1 species)

Averrhoidium gardnerianum Baill. **States:** BA(2). **Habitats:** Ins.

Cardiospermum (4 species)

Cardiospermum anomalum Cambess. **Habits:** climber(1); subshrub(1). **States:** PE(2); PI(1). **Habitats:** Sed.

Cardiospermum corindum L. **Habits:** climber(5); herb(1); liana(3). **Life forms:** chamaephyte(3); liana(1). **States:** BA(2); CE(2); PB(1); PE(6); PI(2). **Habitats:** Cryst, Ins, Sed, Trans, Unc.

Cardiospermum halicacabum L. **Habits:** climber(2); liana(1). **Life forms:** phanerophyte(2). **States:** PE(4); PI(1). **Habitats:** Ins, Riv, Sed, Trans.

Cardiospermum oliveirae Ferrucci **States:** BA(1); PE(1). **Habitats:** Ins.

Cupania (3 species)

Cupania impressinervia Acev.-Rodr. [Synonyms: *Cupania revoluta* Radlk.] **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** PB(1); PE(3). **Habitats:** Agre, Ins, Sed.

Cupania racemosa (Vell.) Radlk. **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Cupania vernalis Cambess. **States:** MG(1). **Habitats:** Arb.

Dilodendron (1 species)

Dilodendron bipinnatum Radlk. **States:** MG(2). **Habitats:** Arb.

Dodonaea (1 species)

Dodonaea viscosa Jacq. **Habits:** shrub(1). **States:** PE(1). **Habitats:** Sed.

Magonia (1 species)

Magonia pubescens A.St.-Hil. [Synonyms: *Magonia glabrata* A.St.-Hil.] **Habits:** tree(4). **Life forms:** phanerophyte(3). **States:** BA(1); CE(2); PB(1); PI(6). **Habitats:** CMaior, Diam, Riv, Sed, Trans.

Matayba (1 species)

Matayba guianensis Aubl. **Habits:** tree(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Paullinia (3 species)

Paullinia cearensis Somner & Ferrucci **Habits:** liana(1). **Life forms:** phanerophyte(1). **States:** CE(2). **Habitats:** Sed.

Paullinia elegans Cambess. **Habits:** climber(1); liana(1). **Life forms:** phanerophyte(1). **States:** CE(4); PB(1). **Habitats:** Riv, Sed.

Paullinia pinnata L. **Habits:** climber(1); liana(1). **Life forms:** phanerophyte(2). **States:** CE(1); PE(3). **Habitats:** Ins, Riv, Trans.

Sapindus (1 species)

Sapindus saponaria L. **Habits:** tree(2). **Life forms:** phanerophyte(1). **States:** CE(1); PE(2). **Habitats:** Riv, Sed.

Serjania (7 species)

Serjania caracasana (Jacq.) Willd. **Life forms:** liana(1). **States:** PI(1). **Habitats:** Sed.

Serjania comata Radlk. **Habits:** liana(1). **States:** BA(1). **Habitats:** Sed.

Serjania glabrata Kunth **Habits:** climber(6); liana(2). **Life forms:** phanerophyte(1). **States:** CE(2); PB(2); PE(6). **Habitats:** Agre, Ins, Riv, Sed, Trans.

Serjania hebecarpa Benth. **Habits:** climber(1). **Life forms:** phanerophyte(1). **States:** CE(1); PB(1). **Habitats:** Ins, Sed.

Serjania lethalis A.St.-Hil. **Habits:** climber(3); liana(1). **Life forms:** phanerophyte(1). **States:** CE(2); PE(2). **Habitats:** Sed.

Serjania marginata Casar. **Habits:** climber(1). **States:** PE(1). **Habitats:** Sed.

Serjania pernambucensis Radlk. **Habits:** climber(1). **States:** PE(1). **Habitats:** Sed.

Talisia (1 species)

Talisia esculenta (Cambess.) Radlk. **Habits:** tree(3). **Life forms:** phanerophyte(1). **States:** CE(2); MG(2); PB(1); PI(1). **Habitats:** Agre, Arb, Sed, Trans.

Urvillea (2 species)

Urvillea laevis Radlk. **Habits:** liana(1). **Life forms:** phanerophyte(1). **States:** BA(1); CE(1). **Habitats:** Ins, Sed.

Urvillea ulmacea Kunth **States:** BA(1). **Habitats:** Sed.

SAPOTACEAE (4 genera; 8 species)

Chrysophyllum (3 species)

Chrysophyllum arenarium Allemão **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Chrysophyllum marginatum (Hook. & Arn.) Radlk. [Synonyms: *Chrysophyllum ebenaceum* Mart.] **Habits:** shrub(1). **States:** CE(3). **Habitats:** Sed.

Chrysophyllum rufum Mart. **Life forms:** phanerophyte(1). **States:** PE(1). **Habitats:** Ins.

Manilkara (3 species)

Manilkara rufula (Miq.) H.J.Lam **Habits:** tree(1). **Life forms:** microphanerophyte(1). **States:** PE(3). **Habitats:** Sed.

Manilkara salzmannii (A.DC.) H.J.Lam **States:** PB(1). **Habitats:** Agre.

Manilkara triflora (Allemão) Monach. **Habits:** shrub(1). **States:** CE(1). **Habitats:** Sed.

Pouteria (1 species)

Pouteria gardneriana (A.DC.) Radlk. **Habits:** tree(1). **States:** PI(1). **Habitats:** Trans.

Sideroxylon (1 species)

Sideroxylon obtusifolium (Roem. & Schult.) T.D.Penn. [Synonyms: *Bumelia sartorum* Mart.] **Habits:** shrub(1); tree(10). **States:** BA(3); PB(13); PE(8); RN(4). **Habitats:** Cryst, Ins, Riv, Sed, Unc.

SCHOEPFIACEAE (1 genus; 1 species)

Schoepfia (1 species)

Schoepfia brasiliensis A.DC. [Synonyms: *Schoepfia obliquifolia* Turcz.] **Habits:** tree(1). **Life forms:** microphanerophyte(1). **States:** BA(2); PB(3); PE(3). **Habitats:** Agre, Ins, Sed.

SCROPHULARIACEAE (1 genus; 1 species)

Ameroglossum (1 species)

Ameroglossum pernambucense Eb. Fisch. et al. **Life forms:** chamaephyte(1); phanerophyte(1). **States:** PB(1); PE(2). **Habitats:** Ins.

SIMAROUBACEAE (2 genera; 4 species)

Simaba (2 species)

Simaba ferruginea A.St.-Hil. **Habits:** tree(1). **States:** BA(2). **Habitats:** Sed.

Simaba floribunda A.St.-Hil. [Synonyms: *Simaba cuneata* A.St.-Hil. & Tul.] **Habits:** tree(2); treelet(1). **Life forms:** microphanerophyte(1). **States:** PE(6). **Habitats:** Sed.

Simarouba (2 species)

Simarouba amara Aubl. **Habits:** tree(1). **Life forms:** microphanerophyte(1). **States:** PE(2). **Habitats:** Sed.

Simarouba versicolor A.St.-Hil. **Habits:** tree(1). **States:** PI(2). **Habitats:** CMaior.

SMILACACEAE (1 genus; 2 species)

Smilax (2 species)

Smilax brasiliensis Spreng. **Life forms:** hemicryptophyte(1). **States:** PB(1). **Habitats:** Ins.

Smilax campestris Griseb. **Life forms:** liana(1). **States:** BA(1). **Habitats:** Ins.

SOLANACEAE (8 genera; 23 species)

Brunfelsia (2 species)

Brunfelsia cuneifolia J.A.Schmidt **Habits:** shrub(1). **States:** CE(1). **Habitats:** Sed.

Brunfelsia uniflora (Pohl) D.Don **Habits:** shrub(2). **States:** CE(1); PB(1). **Habitats:** Riv, Trans.

Capsicum (1 species)

Capsicum parvifolium Sendtn. **Habits:** shrub(5). **Life forms:** phanerophyte(2). **States:** BA(1); PB(5); PE(1); PI(1). **Habitats:** Cryst, Diam, Ins, Riv, Sed.

Cestrum (1 species)

Cestrum axillare Vell. [Synonyms: *Cestrum laevigatum* Schltdl.] **States:** PB(1). **Habitats:** Agre.

Lycium (1 species)

Lycium martii Sendtn. **Habits:** tree(1). **States:** PE(1). **Habitats:** Riv.

Nicotiana (1 species)

Nicotiana glauca Graham **Habits:** shrub(3); subshrub(1). **States:** BA(2); PB(5); PE(2). **Habitats:** Ins, Riv, Sed.

Physalis (2 species)

Physalis angulata L. **Habits:** herb(1); subshrub(1). **States:** PB(1); PE(1); PI(1); RN(1). **Habitats:** Aqua, Cryst, Trans, Unc.

Physalis pubescens L. [Synonyms: *Physalis neesiana* Sendtn.] **Habits:** herb(1). **Life forms:** therophyte(1). **States:** BA(1); PB(1); PE(2). **Habitats:** Aqua, Cryst, Ins, Trans.

Schwenckia (1 species)

Schwenckia americana Rooyen ex L. **Life forms:** therophyte(1). **States:** BA(1); PE(3). **Habitats:** Ins, Unc, Trans.

Solanum (14 species)

Solanum agrarium Sendtn. **Habits:** shrub(1). **States:** PB(1); PE(1). **Habitats:** Cryst, Trans.

Solanum americanum Mill. **Habits:** shrub(1). **States:** CE(2); PE(1). **Habitats:** Ins, Sed.

Solanum asperum Rich. **Life forms:** phanerophyte(1). **States:** PB(1); PE(1). **Habitats:** Agre, Ins.

Solanum bahianum S.Knapp **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1). **Habitats:** Sed.

Solanum capsicoides Allemão **Life forms:** phanerophyte(1). **States:** PB(1). **Habitats:** Ins.

Solanum crinitum Lam. **Habits:** shrub(2). **Life forms:** phanerophyte(2). **States:** CE(2); PI(1). **Habitats:** Sed.

Solanum flaccidum Vell. **Habits:** herb(1); subshrub(1). **States:** PE(2). **Habitats:** Sed.

Solanum jabrense Agra & M.Nee **States:** PB(1). **Habitats:** Cryst.

Solanum megalonyx Sendtn. **States:** BA(2). **Habitats:** Ins.

Solanum paludosum Moric. **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** CE(1); PB(1). **Habitats:** Ins, Trans.

Solanum paniculatum L. **Habits:** shrub(7). **States:** BA(3); CE(3); PB(5); PE(3); PI(1). **Habitats:** Aqua, Ins, Riv, Sed, Trans, Unc.

Solanum rhytidoandrum Sendtn. [Synonyms: *Solanum baturitense* Huber] **Habits:** shrub(8). **States:** CE(3); PB(3); PE(3); PI(2). **Habitats:** Cryst, Ins, Riv, Sed, Trans.

Solanum stipulaceum Willd. ex Roem. & Schult. **Habits:** herb(1); shrub(3). **States:** BA(1); CE(1); PE(4). **Habitats:** Ins, Sed.

Solanum thomasiifolium Sendtn. **Habits:** shrub(1). **States:** PE(2). **Habitats:** Ins, Sed.

TRIGONIACEAE (1 genus; 2 species)

Trigonia (2 species)

Trigonia bahiensis E.F.Guim. & Miguel **Habits:** climber(1). **States:** CE(1). **Habitats:** Sed.

Trigonia nivea Cambess. **Habits:** liana(1); shrub(1). **Life forms:** phanerophyte(1). **States:** BA(3); CE(2); PE(1). **Habitats:** Diam, Ins, Sed.

TURNERACEAE (2 genera; 16 species)

Piriqueta (5 species)

Piriqueta cistoides subsp. ***caroliniana*** (Walt.) Arbo [Synonyms: *Piriqueta caroliniana* var. *jacobinae* Urb.] **States:** BA(1). **Habitats:** Sed.

Piriqueta duarteana (Cambess.) Urb. **Habits:** herb(2); shrub(1). **States:** BA(2); PE(3); PI(1). **Habitats:** Ins, Sed, Trans, Sed.

Piriqueta guianensis N.E.Br. **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Cryst.

Piriqueta racemosa (Jacq.) Sweet **Habits:** herb(2). **Life forms:** chamaephyte(1); therophyte(1). **States:** BA(1); PE(3). **Habitats:** Aqua, Cryst.

Piriqueta sidifolia (Cambess.) Urb. **Habits:** shrub(1); subshrub(2). **Life forms:** chamaephyte(1). **States:** CE(2); PI(1). **Habitats:** Sed.

Turnera (11 species)

Turnera blanchetiana Urb. **Habits:** herb(1); shrub(4). **Life forms:** phanerophyte(2). **States:** CE(5); PE(1); PI(4). **Habitats:** Ins, Sed, Trans.

Turnera calyptrocarpa Urb. **Habits:** herb(1); subshrub(1). **States:** BA(3); CE(1); PI(1). **Habitats:** Ins, Trans.

Turnera cearensis Urb. **Habits:** subshrub(1). **States:** PB(1). **Habitats:** Ins.

Turnera chamaedrifolia Cambess. **States:** BA(3). **Habitats:** Ins, Sed.

Turnera coerulea DC. **Habits:** subshrub(2). **Life forms:** chamaephyte(2). **States:** CE(2). **Habitats:** Sed.

Turnera diffusa Willd. ex Schult. [Synonyms: *Turnera microphylla* Desv. ex Ham.] **Habits:** herb(1); shrub(1); subshrub(2). **Life forms:** nanophanerophyte(1). **States:** BA(1); PE(6). **Habitats:** Sed.

Turnera macrophylla Urb. **States:** PE(1). **Habitats:** Cryst.

Turnera opifera Mart. **Habits:** subshrub(1). **States:** BA(1). **Habitats:** Sed.

Turnera pumilea L. **Habits:** subshrub(1). **Life forms:** chamaephyte(2). **States:** CE(2); PE(4). **Habitats:** Cryst, Unc.

Turnera subulata Sm. **Habits:** climber(1); subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(1); PB(1). **Habitats:** Cryst, Ins.

Turnera ulmifolia L., According specialist M.M. Arbo, all varieties of *Turnera ulmifolia* that occurred in Brazil were elevated to species and this name should no longer be used to any Brazilian material. **Habits:** herb(1); subshrub(1). **Life forms:** therophyte(2). **States:** PB(1); PE(3); PI(1); RN(1). **Habitats:** Trans, Ins, Riv, Trans, Unc.

TYPHACEAE (1 genus; 1 species)

Typha (1 species)

Typha domingensis Pers. **States:** BA(4). **Habitats:** Aqua.

ULMACEAE (1 genus; 1 species)

Phyllostylon (1 species)

Phyllostylon brasiliense Capan. ex Benth. & Hook.f. **States:** PE(2). **Habitats:** Cryst.

URTICACEAE (3 genera; 4 species)

Cecropia (2 species)

Cecropia pachystachya Trécul **Life forms:** phanerophyte(1). **States:** BA(3); PE(1). **Habitats:** Ins.

Cecropia peltata L. **Habits:** tree(1). **States:** PI(1). **Habitats:** Trans.

Laportea (1 species)

Laportea aestuans (L.) Chew **Habits:** herb(1). **Life forms:** therophyte(2). **States:** BA(1); CE(1). **Habitats:** Cryst, Ins.

Pilea (1 species)

Pilea hyalina Fenzl **Habits:** herb(1). **Life forms:** therophyte(3). **States:** PE(5). **Habitats:** Agre, Ins, Trans.

VELLOZIACEAE (1 genus; 1 species)

Vellozia (1 species)

Vellozia plicata Mart. [Synonyms: *Nanuza plicata* (Mart.) L.B.Sm. & Ayensu] **Habits:** herb(1). **States:** BA(3); PE(1); PI(1). **Habitats:** Ins, Trans.

VERBENACEAE (5 genera; 23 species)

Duranta (1 species)

Duranta erecta L. [Synonyms: *Duranta repens* L.] **Habits:** shrub(1). **States:** PB(1); PE(1). **Habitats:** Agre, Trans.

Lantana (5 species)

Lantana caatingensis Moldenke **Habits:** shrub(1). **States:** BA(1). **Habitats:** Sed.

Lantana camara L. [Synonyms: *Lantana mista* L.] **Habits:** shrub(15); subshrub(4). **Life forms:** phanerophyte(8). **States:** BA(3); CE(8); PB(10); PE(17); PI(3); RN(2). **Habitats:** Agre, Cryst, Diam, Ins, Riv, Sed, Trans, Unc.

Lantana canescens Kunth **Life forms:** phanerophyte(1). **States:** BA(1); PI(1). **Habitats:** Sed.

Lantana fucata Lindl. **Habits:** shrub(1); subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(2). **Habitats:** Sed, Trans.

Lantana montevidensis (Spreng.) Briq. [Synonyms: *Lantana sellowiana* Link & Otto] **Life forms:** phanerophyte(1). **States:** PB(1). **Observations:** According to specialist T.R.S. Silva this species occurs in the Pampas and in the Atlantic Forest in the South of Brazil. It is unlikely that this species also occurs in the semiarid of Northeastern Brazil and it is almost certainly a missidentification.. **Habitats:** Ins.

Lippia (11 species)

Lippia alba (Mill.) N.E.Br. **Habits:** shrub(1). **Life forms:** phanerophyte(1). **States:** PE(3). **Habitats:** Aqua, Ins, Riv.

Lippia gracilis Schauer **Habits:** shrub(7). **Life forms:** chamaephyte(1); phanerophyte(1). **States:** CE(1); PB(5); PE(4). **Habitats:** Cryst, Ins, Riv, Sed.

Lippia lasiocalycina Cham. **States:** BA(2). **Habitats:** Ins.

Lippia magentea T.Silva **Habits:** subshrub(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Lippia microphylla Cham. **States:** PE(2). **Habitats:** Cryst.

Lippia origanoides Kunth [Synonyms: *Lippia rigida* Schauer] **Habits:** subshrub(1). **Life forms:** microphanerophyte(1). **States:** PE(4). **Habitats:** Cryst, Sed.

Lippia pohliana Schauer **States:** BA(2). **Habitats:** Ins.

Lippia riedeliana Schauer **States:** PE(1). **Habitats:** Sed.

Lippia schomburgkiana Schauer **Habits:** shrub(2). **States:** PE(3). **Habitats:** Sed.

Lippia sidoides Cham. **Habits:** shrub(1). **States:** CE(1). **Habitats:** Trans.

Lippia thymoides Mart. & Schauer **Habits:** shrub(1). **States:** BA(2). **Habitats:** Diam, Sed.

Priva (1 species)

Priva bahiensis A.DC. **States:** BA(2). **Habitats:** Aqua, Ins.

Stachytarpheta (5 species)

Stachytarpheta angustifolia (Mill.) Vahl [Synonyms: *Stachytarpheta elatior* Schrad. ex Schult.] **Life forms:** phanerophyte(1). **States:** BA(4); PB(1); PE(1). **Habitats:** Aqua, Ins.

Stachytarpheta cayennensis (Rich.) Vahl [Synonyms: *Stachytarpheta dichotoma* (Ruiz & Pav.) Vahl] **Habits:** herb(1). **Life forms:** therophyte(1). **States:** BA(1); CE(1); PE(1). **Habitats:** Cryst, Sed.

Stachytarpheta coccinea Schauer **Habits:** shrub(1). **Life forms:** therophyte(1). **States:** CE(2). **Habitats:** Cryst, Sed.

Stachytarpheta microphylla Walp. [Synonyms: *Stachytarpheta sanguinea* Mart.] **Habits:** herb(1). **Life forms:** therophyte(1). **States:** PE(1); RN(1). **Habitats:** Cryst, Trans.

Stachytarpheta sessilis Moldenke **Life forms:** therophyte(1). **States:** CE(1). **Habitats:** Cryst.

VIOLACEAE (2 genera; 2 species)

Hybanthus (1 species)

Hybanthus calceolaria (L.) Oken [Synonyms: *Hybanthus ipecacuanha* (L.) Baill.] **Habits:** herb(3). **Life forms:** hemicryptophyte(2). **States:** CE(3); PE(3); RN(1). **Habitats:** Cryst, Ins, Sed, Unc.

Noisettia (1 species)

Noisettia orchidiflora (Rudge) Ging. [Synonyms: *Noisettia longifolia* Kunth] **States:** PE(1). **Habitats:** Cryst.

VITACEAE (1 genus; 9 species)

Cissus (9 species)

Cissus albida Cambess. **Habits:** climber(1). **States:** CE(1). **Habitats:** Sed.

Cissus decidua Lombardi **Habits:** climber(3). **States:** PB(1); PE(3). **Habitats:** Ins, Trans.

Cissus erosa Rich. **Habits:** climber(1). **States:** PB(1); PE(1). **Habitats:** Ins.

Cissus gongylodes (Baker) Planch. **Habits:** liana(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Cryst.

Cissus simsiana Schult. & Schult.f. **Habits:** climber(1). **Life forms:** ?(1); chamaephyte(1); phanerophyte(2). **States:** BA(2); CE(1); PE(5). **Habitats:** Cryst, Ins.

Cissus subrhomboidea (Baker) Planch. **Life forms:** therophyte(1). **States:** PE(1). **Habitats:** Ins.

Cissus ternata (Baker) Planch. A doubtful name which should not be used in floristic studies anymore. The type of *Cissus ternata* was destroyed and the species in question may be *Cissus decidua* Lombardi or another Brazilian species but this cannot now be ascertained (J.A. Lombardi, pers. comm.). **States:** BA(1). **Observations:** Typus destroyed. Status uncertain. Maybe a synonym.. **Habitats:** Sed.

Cissus tinctoria Mart. **Habits:** liana(1). **Life forms:** chamaephyte(1). **States:** CE(1). **Habitats:** Sed.

Cissus verticillata (L.) Nicolson & C.E.Jarvis [Synonyms: *Cissus sicyoides* L.] **Habits:** liana(2). **States:** CE(2). **Habitats:** Trans.

VOCHYSIACEAE (3 genera; 6 species)

Callisthene (3 species)

Callisthene fasciculata Mart. **Habits:** treelet(1). **Life forms:** chamaephyte(1). **States:** CE(1); MG(1); PI(4). **Habitats:** Arb, CMaior, Ins.

Callisthene major Mart. & Zucc. [Synonyms: *Callisthene blanchetii* Warm.] **States:** PB(1). **Habitats:** Cryst.

Callisthene microphylla Warm. **Habits:** tree(2). **Life forms:** phanerophyte(1). **States:** CE(1); PE(1); PI(2). **Habitats:** Ins, Sed, Trans.

Qualea (2 species)

Qualea grandiflora Mart. **Habits:** tree(1). **States:** PI(4). **Habitats:** CMaior.

Qualea parviflora Mart. **Habits:** tree(2). **States:** PI(5). **Habitats:** CMaior, Trans.

Salvertia (1 species)

Salvertia convallariodora A.St.-Hil. **States:** PI(1). **Habitats:** CMaior.

XYRIDACEAE (1 genus; 1 species)

Xyris (1 species)

Xyris jupicai Rich. **States:** PE(1). **Habitats:** Ins.

ZYGOPHYLLACEAE (1 genus; 2 species)

Kallstroemia (2 species)

Kallstroemia maxima (L.) Hook. & Arn. **Habits:** herb(1). **States:** PE(1). **Habitats:** Riv.

Kallstroemia tribuloides (Mart.) Steud. **Life forms:** therophyte. **States:** PE(3). **Habitats:** Sed.

Appendix 3- List of exotic species reported in the 131 papers compiled for this catalogue.

AGAVACEAE

Agave sisalana Perrine

APIACEAE

Foeniculum vulgare Mill.

APOCYNACEAE

Calotropis procera (Aiton) W.T.Aiton

ARACEAE

Alocasia macrorrhizos (L.) G.Don

ASPARAGACEAE

Sansevieria hyacinthoides **(L.) Druce**
(Synonyms: *Sansevieria guineensis (L.)* Willd.)

ASTERACEAE

Bidens bipinnata L.
Bidens pilosa L.

Calyptocarpus biaristatus **(DC.) H.Rob.**

CUCURBITACEAE

Momordica charantia L.

EUPHORBIACEAE

Euphorbia tirucalli L.
Jatropha gossypiifolia L.

FABACEAE

Cajanus cajan **(L.) Huth.**

Crotalaria retusa L.
Pithecellobium dulce (Roxb.) Benth.
Prosopis juliflora (Sw.) DC.

MARANTACEAE

Maranta arundinacea L.

MELIACEAE

Melia azedarach L.

ORCHIDACEAE

Oeceoclades maculata (Lindl.) Lindl.

PAPAVERACEAE

Argemone mexicana L.

POACEAE

Aristida adscensionis L.
Cenchrus ciliaris L.
Eragrostis pilosa (L.) P.Beauv.
Megathyrsus maximus (Jacq.) B.K.Simon & S.W.L.Jacobs (Synonyms: *Panicum maximum* Hochst. ex A.Rich.)

Melinis minutiflora P.Beauv.

Melinis repens (Willd.) Zizka
(Synonyms: *Rhynchelytrum repens* (Willd.) C.E.Hubb.)

Pennisetum pedicellatum Trin.

Urochloa fusca (Sw.) B.F.Hansen & Wunderlin

Urochloa mollis (Sw.) Morrone & Zuloaga
(Synonyms: *Brachiaria mollis* (Sw.) Parodi)

Urochloa mutica (Forssk.) T.Q.Nguyen

Urochloa plantaginea (Link) R.D.Webster
(Synonyms: *Brachiaria plantaginea* (Link) Hitchc.)

SOLANACEAE

***Brugmansia arborea* (L.) Steud.**

***Datura stramonium* L.**

Appendix 4- List of *nomina nuda* and names used in error to refer to plants in the Caatinga Phytogeographical Domain.

Family	*Nomina nuda* and names used in error	Notes
Amaranthaceae	*Gomphrena* aff. *leucocarpa* Mart.	Name used in error. Maybe the authors wanted to write *Gomphrena leucocephala* Mart.
Anacardiaceae	*Hermogenodendron concinnum* (Schott) Santin	This is a nomen nudum and this genus is not validly published. According J.R.Pirani the valid name Astronium concinnum Schott should have been used instead.
Apocynaceae	*Marsdenia carunceroides* (Hook.) Faurn.	Name used in error. probably referrable to *Marsdenia loniceroides* (Hook.) E.Fourn.
Araceae	*Scaphispatha hastifolia* Hook.	Name used in error. According specialist E.G.Gonçalves, probably an amalgam of *Spathicarpa hastifolia* Hook., which is a species of Southern Brazil, and *Scaphispatha gracilis* Brongn. ex Schott, which occurs in the transition of Caatinga to Cerrado.
Asteraceae	*Blainvillea ligulata* (L.f.) DC.	Name used in error. Maybe a misspelling of *Blainvillea latifolia* (Lf.) DC., which is a synonym of *B. acmella* (L.) Philipson.
Bignoniaceae	*Anemopaegma ataidei* A.H.Gentry	Nomen nudum. The name *Anemopaegma ataidei* A.H.Gentry has been cited for Caatinga, but Gentry died before publishing the species.
Bignoniaceae	*Cuspidaria cratensis* A.H. Gentry	Nomen nudum. The name *Cuspidaria cratensis* A.H. Gentry has been cited for Caatinga, but Gentry died before publishing the species.
Bignoniaceae	*Cuspidaria laterifolia* (Mart.) A. DC.	Probably a misspelling of the name *Cuspidaria lateriflora* (Mart.) DC.
Bignoniaceae	*Cuspidaria morii* A.H. Gentry	Nomen nudum. The name Cuspidaria morii *A.H. Gentry* has been cited for Caatinga, but Gentry died before publishing the species.
Bignoniaceae	*Mansoa asperulum* (Bur. & K.Sch.) Gentry	Nomen nudum. The name *Mansoa asperulum* (Bur. & K.Sch.) Gentry has been cited for Caatinga, but Gentry died before publishing the species.
Bignoniaceae	*Proterantha glandulosa* A.H. Gentry	Nomen nudum. According specialist L.G. Lohmann, this is a distinctive species that Gentry left as nude name when he died. Even the genus he intended to create was left nude and thus should not be used in floristic studies.
Capparaceae	*Cleome auriculata* L.	Name used in error. Maybe a misspelling of Cleome aculeata L.
Capparaceae	*Cleome ternicifolia* (Mart. & Zucc.) H.H. Iltis	Name used in error. Probably this is a misspelling of *Cleome tenuifolia* (Mart. & Zucc.) Iltis, which is synonym of *Physostemon tenuifolium* Mart. & Zucc.
Capparaceae	*Colicodendron jacobinae* (Moric.) Hutch.	Name published in error. We didn't find any reference for this name in any major botanical databases nor with specialists consulted.

Cleomaceae	*Cleome pernambucensis* Iltis & Costa, Silva	Nomen nudum still waiting to be published.
Dioscoreaceae	*Dioscorea adenoptera* Mart. ex Griseb.	Name used in error. Probably a misspelling of *Dioscorea adenocarpa* Mart. ex Griseb., now *Dioscorea ovata* Vell.
Euphorbiaceae	*Argythamnia volubilis* L.	Name used in error. We didn't find any reference for this name in any major botanical databases.
Euphorbiaceae	*Chamaesyce alsinifolia* Boiss.	Name used in error. Probably a misspelling of *Chamaesyce alsiniflora* (Baill.) D.C.Hassall.
Euphorbiaceae	*Manihot brachypoda* Müll.Arg.	Name used in error. Maybe the authors wanted to write *Manihot brachyloba* Müll. Arg.
Fabaceae	*Acacia polyphylla* var. *parviflora* (Benth.) L. Rico	*Acacia polyphylla* DC. (= Senegalia polyphylla (DC.) Britton & Rose) Is a valid name, but the variety *Acacia polyphylla* var. *parviflora* (Benth.) L. Rico has not been published. Rico says she intends to publish this variety, but the publication will probably be done under *Senegalia* and this name will remain *nudum*.
Fabaceae	*Bauhinia platysepala* Burch.	Name used in error. Almost certainly *Bauhinia platypetala* Burch. ex Benth.
Fabaceae	*Caesalpinia roton* Mart. ex Tul	Name used in error. We didn't find any reference for this name in any major botanical databases.
Fabaceae	*Chamaecrista metitans* Moench.	Name used in error. Probably a misspelling of *Chamaecrista nictitans* (L.) Moench.
Fabaceae	*Chamaecrista repens* var. *multiflora* (Benth.) H.S. Irwin & Barneby	*Chamaecrista repens* (Vogel) H.S.Irwin & Barneby is a valid name of a plant that occurs in Caatinga, but this variety is probably a misspelling of Chamaecrista repens var. multijuga (Benth.) H.S.Irwin & Barneby.
Fabaceae	*Deguelia nitidula* (Benth.) Az.-Tozzi	Up to 2011 (the year we finished our synthesis) the name *Deguelia nitidula* was not yet published. We contacted A. Azevedo Tozzi and R. Camargo and they say the name will be published soon. If necessary, the name *Lonchocarpus nitidulus* Benth. is available, but will be put under synonym of *Deguelia nitidula* (Benth.) A.M.G.Azevedo & R.A.Camargo when Tozzi and Camargo's paper is released.
Fabaceae	*Mimosa stipulacea* Ducke	Name used in error. The name *Mimosa stipulacea* Roxb. (not *M. stipulacea* Ducke) do exists, but this species is from Asia and is not the case here.
Lythraceae	*Cuphea silvestris* Vahl	Name used in error. According specialist Shirley Graham, there is no reference to this name in any major monography of the genus, nor in the eletronic databanks.
Malpighiaceae	*Byrsonima lutea* (Griseb.) Cuatrec.	Name used in error. Maybe the authors wanted to refer to Banisteriopsis lutea (Griseb.) Cuatrec.

Malvaceae	*Malvestarum scaberum* Jaccke.	Name used in error. Maybe the authors wanted to refer to Malvastrum scabrum (Cav.) A. Gray, which is synonym of Malvastrum tomentosum (L.) S.R.Hill subsp. tomentosum.
Malvaceae	*Physaloides stoloniferum* (Salzm.) H. C. Monteiro	Name used in error. This is not a valid name. Probably the authors wanted to refer to *Physalastrum stoloniferum* (Salzm. ex Turcz.) Monteiro.
Malvaceae	*Pseudomalachra guianensis* (K. Schum.) H. Monteiro	Name used in error. We didn't find any reference for this name in any major botanical databases nor with specialists consulted.
Melastomataceae	*Mouriri surinamensis* Aubl.	Name used in error. We didn't find any reference for this name or any similar in any major botanical databases nor with specialists consulted.
Myrtaceae	*Eugenia personii* McVaugh	Name used in error. Maybe the authors intended to write *Psidium persoonii* McVaugh, but *P. personii* is recorded mainly in the Amazon region.
Myrtaceae	*Myrcia bellata* O.Berg	Name used in error. Probably a misspelling of Myrcia bullata O.Berg, but Myrcia bullata is recorded mainly from Southeastern Brazil.
Myrtaceae	*Myrcia myrsinoides* Berg	Name used in error. Probably the authors wanted to refer to *Psidium myrsinoides* O.Berg., which is now under *Psidium myrtoides* O.Berg.
Nyctaginaceae	*Guapira laxa* (Netto) Furlan	A quite common nomen nudum based on *Pisonia laxa* Netto, cited in 16 botanical surveys. A.M. Guiulietti, who was supervisor of A.Furlan, intends to validate this name (personal communication), but before using it one should verify whether it was already published. Otherwise the name *Pisonia laxa* Netto should be used instead.
Polygonaceae	*Coccoloba termiflora* Lind.	Name used in error. Probably the authors intended refer to *Coccoloba tenuiflora* Lindau, but this species is not registered to Caatinga by the "Flora do Brasil" checklist.
Solanaceae	*Solanum chytidoaudrum* Lam.	Name used in error. Maybe a misspelling of *Solanum rhytidoandrum* Sendtn.
Turneraceae	*Turnera ulmifolia* var. *guianensis* Aubl.	Name used in error. Although *Turnera ulmifolia* L. is a valid name, this variety has not been published and is thus a *nomen nudum*. It should also be noted that all varieties of *Turnera ulmifolia* that occurred in Brazil were elevated to species and *Turnera ulmifolia* should no longer be used to any Brazilian material.

Appendix 5 – number of records of each species in each environment type in the Caatinga Phytogeographical Domain including native and exotic plants. (*): exotic species reported in our database.

Species	Crystalline Caatinga (n= 34)	Sedimentary Caatinga (n= 18)	Transition Crystalline / Sedimentary (n= 6)	Inselberg (n= 11)	Agreste (n=6)	Arboreal Caatinga (n= 9)	Campo Maior Ecotone (n= 2)	Chapada Diamantina (n= 3)	Riverine forest (n= 10)	Unclassified (n= 21)	Aquatic Communities (n= 11)	Total number of occurrences in terrestrial ecosystems (n= 120)	Total number of occurrences in the CPD (n= 131)
Acalypha brasiliensis	0	0	0	5	0	0	0	0	0	0	0	5	5
Acalypha multicaulis	3	3	0	1	3	0	0	0	1	0	0	11	11
Acalypha poiretii	0	0	1	0	0	0	0	0	0	0	0	1	1
Acalypha villosa	0	1	0	0	0	0	0	0	0	0	0	1	1
Acanthospermum hispidum	0	0	1	1	0	0	0	0	0	0	1	2	3
Achyrocline satureioides	0	1	0	1	0	0	0	0	0	0	0	2	2
Acianthera ochreata	0	0	0	4	0	0	0	0	0	0	0	4	4
Acmella uliginosa	1	0	0	0	0	0	0	0	1	0	1	2	3
Acosmium diffusissimum	0	1	0	0	0	0	0	0	0	0	0	1	1
Acritopappus buiquensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Adenocalymma axillare	0	1	1	0	0	0	0	0	0	0	0	2	2
Adenocalymma comosum	0	0	0	1	0	0	0	0	0	0	0	1	1
Adenocalymma involucratum	0	0	2	0	0	0	0	0	0	0	0	2	2
Adenocalymma scabriusculum	0	0	1	0	0	0	0	0	0	0	0	1	1
Aechmea aquilega	0	1	0	1	0	0	0	0	0	0	0	2	2
Aechmea leptantha	0	0	0	3	1	0	0	0	0	0	0	4	4
Aechmea lingulata	0	0	0	2	0	0	0	0	0	0	0	2	2
Aegiphila pernambucensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Aegiphila smithii	0	0	0	0	0	1	0	0	0	0	0	1	1

Aeschynomene evenia	0	0	0	0	0	0	0	0	0	0	5	0	5
Aeschynomene histrix	1	0	0	0	0	0	0	0	0	0	0	1	1
Aeschynomene marginata	0	1	0	0	0	0	0	0	0	0	0	1	1
Aeschynomene martii	0	2	0	0	0	0	0	0	0	0	0	2	2
Aeschynomene mollicula	0	0	0	0	1	0	0	0	0	0	0	1	1
Aeschynomene scabra	0	0	0	1	0	0	0	0	0	0	0	1	1
Aeschynomene sensitiva	0	0	0	1	0	0	0	0	1	2	0	4	4
Aeschynomene viscidula	0	1	1	0	0	0	0	0	0	0	0	2	2
Agave sisalana*	0	0	0	2	0	0	0	0	0	0	0	2	2
Ageratum conyzoides	2	0	0	2	0	0	0	0	0	0	2	4	6
Agonandra brasiliensis	0	6	0	0	0	0	2	0	0	0	0	8	8
Albizia inundata	0	0	1	0	1	0	0	1	1	0	0	4	4
Albizia niopoides	0	0	0	0	0	1	0	0	0	0	0	1	1
Albizia polycephala	0	1	0	0	1	0	0	0	0	0	0	2	2
Alibertia edulis	0	1	0	0	0	0	2	0	0	0	0	3	3
Alibertia macrantha	0	1	0	0	0	0	0	0	0	0	0	1	1
Allamanda blanchetii	5	6	0	2	0	0	2	0	2	1	0	18	18
Allamanda puberula	0	2	1	0	0	0	0	0	0	0	0	3	3
Allophylus edulis	0	0	1	0	0	3	0	0	0	0	0	4	4
Allophylus laevigatus	0	0	0	0	2	0	0	0	0	0	0	2	2
Allophylus quercifolius	5	2	1	0	2	0	0	0	4	0	0	14	14
Allophylus racemosus	0	0	0	0	0	1	0	0	0	0	0	1	1
Allophylus sericeus	0	5	0	0	0	0	0	0	0	0	0	5	5
Alocasia	0	0	0	0	1	0	0	0	0	0	0	1	1

macrorrhizos*													
Alseis floribunda	0	0	0	0	1	0	0	2	0	0	0	3	3
Alstroemeria caiaponica	0	1	0	0	0	0	0	0	0	0	0	1	1
Alstroemeria longistaminea	0	0	0	1	0	0	0	0	0	0	0	1	1
Alstroemeria piauhyensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Alternanthera bettzichiana	0	1	0	0	0	0	0	0	0	0	0	1	1
Alternanthera brasiliana	2	3	2	6	1	0	0	0	0	1	0	15	15
Alternanthera pungens	0	0	0	0	0	0	0	0	0	0	1	0	1
Alternanthera ramosissima	0	1	0	0	0	0	0	0	0	0	0	1	1
Alternanthera tenella	5	0	2	0	0	0	0	0	0	0	1	7	8
Alvimiantha tricamerata	1	0	0	0	0	0	0	0	0	0	0	1	1
Amaranthus viridis	0	0	1	1	0	0	0	0	1	0	0	3	3
Amasonia campestris	0	4	0	0	0	0	0	0	0	0	0	4	4
Amburana cearensis	12	2	2	0	1	0	2	2	3	6	0	30	30
Ameroglossum pernambucense	0	0	0	3	0	0	0	0	0	0	0	3	3
Ammannia latifolia	0	0	0	0	0	0	0	0	0	0	5	0	5
Amphilophium crucigerum	0	3	0	2	1	0	0	0	0	0	0	6	6
Anacardium occidentale	0	3	0	1	0	0	2	0	0	0	0	6	6
Anadenanthera colubrina	25	2	4	2	2	8	1	1	7	11	0	63	63
Anadenanthera peregrina	0	0	0	0	0	1	0	0	0	0	0	1	1
Anagallis minima	0	0	0	2	0	0	0	0	0	0	0	2	2
Andira surinamensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Andira vermifuga	0	0	1	0	0	0	0	0	0	0	0	1	1

Andropogon selloanus	0	0	0	1	0	0	0	0	0	0	0	1	1
Aneilema brasiliense	1	0	0	0	0	0	0	0	0	0	0	1	1
Anemia flexuosa	0	0	0	2	0	0	0	0	0	0	0	2	2
Anemopaegma acutifolium	0	1	0	0	0	0	0	0	0	0	0	1	1
Anemopaegma goyazense	0	1	0	0	0	0	0	0	0	0	0	1	1
Anemopaegma laeve	0	2	2	0	0	0	0	0	0	0	0	4	4
Anemopaegma velutinum	0	1	0	0	0	0	0	0	0	0	0	1	1
Angelonia biflora	1	0	1	0	0	0	0	0	0	0	0	2	2
Angelonia blanchetii	0	1	0	0	0	0	0	0	0	0	0	1	1
Angelonia campestris	0	0	0	1	0	0	0	0	1	0	0	2	2
Angelonia cornigera	0	2	2	0	0	0	0	0	0	0	0	4	4
Angelonia pubescens	1	0	0	1	0	0	0	0	0	0	0	2	2
Angelonia salicariifolia	0	0	0	0	1	0	0	0	1	0	2	2	4
Anisacanthus trilobus	1	3	1	0	0	0	0	0	0	0	0	5	5
Aniseia martinicensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Annona glabra	0	0	0	0	0	0	0	1	0	0	0	1	1
Annona leptopetala	3	14	4	1	0	0	0	1	2	1	0	26	26
Annona spinescens	0	1	0	0	0	0	0	0	0	0	0	1	1
Annona sylvatica	0	0	0	0	0	2	0	0	0	0	0	2	2
Anthephora hermaphrodita	0	0	0	1	0	0	0	0	0	1	1	2	3
Anthurium affine	0	1	0	6	2	0	0	0	0	0	0	9	9
Anthurium gracile	0	0	0	1	0	0	0	0	0	0	0	1	1
Anthurium petrophilum	0	0	0	2	0	0	0	0	0	0	0	2	2
Aosa rupestris	0	0	0	6	0	0	0	0	0	0	0	6	6
Apodanthera	0	0	0	0	1	0	0	0	0	0	0	1	1

glaziovii													
Apterokarpos gardneri	0	1	0	0	0	0	0	0	0	0	0	1	1
Apuleia grazielana	0	1	0	0	0	0	0	0	0	0	0	1	1
Apuleia leiocarpa	0	1	0	0	0	6	0	0	0	0	0	7	7
Arachis dardani	2	0	0	0	0	0	0	0	0	0	0	2	2
Aralia excelsa	0	0	0	0	0	4	0	0	0	0	0	4	4
Aralia warmingiana	3	0	0	0	0	0	0	0	0	0	0	3	3
Argemone mexicana*	0	0	1	0	0	0	0	0	1	0	0	2	2
Aristida adscensionis*	4	0	0	0	0	0	0	0	0	0	0	4	4
Aristida elliptica	1	0	0	0	0	0	0	0	0	0	0	1	1
Aristida setifolia	1	0	0	1	0	0	0	0	0	2	0	4	4
Aristolochia birostris	0	0	1	3	1	0	0	0	0	0	0	5	5
Arrojadoa penicillata	0	1	0	2	0	0	0	0	0	0	0	3	3
Arrojadoa rhodantha	2	1	1	0	0	0	0	0	1	0	0	5	5
Asclepias curassavica	0	1	1	0	0	0	0	0	0	0	0	2	2
Aspidosperma cuspa	1	0	0	0	0	0	2	0	0	0	0	3	3
Aspidosperma cylindrocarpon	0	0	0	0	0	0	0	1	0	0	0	1	1
Aspidosperma discolor	0	4	0	0	1	0	0	0	0	0	0	5	5
Aspidosperma multiflorum	0	6	3	0	0	0	2	0	0	0	0	11	11
Aspidosperma polyneuron	0	0	0	0	0	1	0	0	0	0	0	1	1
Aspidosperma pyricollum	0	0	0	1	0	0	0	0	0	0	0	1	1
Aspidosperma pyrifolium	27	4	4	3	4	8	2	0	10	16	0	78	78
Aspidosperma ramiflorum	0	0	0	0	0	0	0	1	0	0	0	1	1
Aspidosperma riedelii	0	1	0	0	0	0	0	0	0	0	0	1	1

Aspidosperma subincanum	0	5	0	0	0	0	2	0	0	0	0	7	7
Aspilia attenuata	1	1	0	0	0	0	0	0	0	0	0	2	2
Aspilia bonplandiana	0	1	0	0	0	0	0	0	0	0	0	1	1
Astraea comosa	0	0	0	1	1	0	0	0	0	0	0	2	2
Astraea lobata	2	1	1	5	0	0	0	0	1	1	0	11	11
Astrocaryum vulgare	0	0	0	0	0	0	1	0	0	0	0	1	1
Astronium fraxinifolium	0	0	1	0	0	1	1	0	0	0	0	3	3
Averrhoidium gardnerianum	0	0	0	2	0	0	0	0	0	0	0	2	2
Axonopus aureus	0	0	0	1	0	0	0	0	0	0	0	1	1
Axonopus capillaris	0	0	1	0	0	0	0	0	0	0	0	1	1
Axonopus polydactylus	0	1	0	0	0	0	0	0	0	0	0	1	1
Axonopus purpusii	0	0	0	0	0	0	0	0	0	1	0	1	1
Ayenia erecta	1	0	1	0	0	0	0	0	0	0	0	2	2
Azolla caroliniana	0	0	0	0	0	0	0	0	0	0	1	0	1
Azolla filiculoides	0	0	0	0	0	0	0	0	0	0	5	0	5
Baccharis oxyodonta	0	1	0	0	0	0	0	0	0	0	0	1	1
Baccharis trinervis	0	1	0	0	0	0	0	0	0	0	0	1	1
Bacopa aquatica	0	0	0	0	0	0	0	0	0	0	1	0	1
Bacopa stricta	0	0	0	0	0	0	0	0	0	0	1	0	1
Bakeridesia andradelimae	0	0	0	1	0	0	0	0	0	0	0	1	1
Balfourodendron molle	0	3	0	0	0	1	0	2	0	0	0	6	6
Banisteriopsis angustifolia	0	1	0	0	0	0	0	0	0	0	0	1	1
Banisteriopsis laevifolia	0	1	0	0	0	0	0	0	0	0	0	1	1
Banisteriopsis muricata	0	2	0	0	0	0	0	0	0	0	0	2	2
Banisteriopsis oxyclada	0	1	0	0	0	0	0	0	0	0	0	1	1
Banisteriopsis	0	2	0	0	0	0	0	0	0	0	0	2	2

schizoptera													
Banisteriopsis stellaris	0	7	0	0	0	0	0	0	0	0	0	7	7
Barnebya harleyi	0	1	0	2	0	0	0	0	0	0	0	3	3
Bauhinia acuruana	0	14	3	2	0	0	0	0	0	0	0	19	19
Bauhinia catingae	1	0	0	0	0	0	0	0	0	0	0	1	1
Bauhinia cheilantha	26	2	5	1	3	0	0	0	5	13	0	55	55
Bauhinia dubia	0	1	0	0	0	0	2	0	0	0	0	3	3
Bauhinia forficata	0	0	2	0	0	7	0	0	0	0	0	9	9
Bauhinia pentandra	1	5	1	1	0	0	0	0	1	0	0	9	9
Bauhinia pulchella	0	3	1	0	0	0	2	0	0	0	0	6	6
Bauhinia subclavata	0	6	0	0	0	0	0	0	0	0	0	6	6
Bauhinia ungulata	0	3	0	0	0	0	1	0	0	0	0	4	4
Begonia fischeri	0	0	0	0	0	0	0	0	0	0	1	0	1
Begonia larorum	0	0	0	1	0	0	0	0	0	0	0	1	1
Begonia lealii	0	0	0	1	0	0	0	0	0	0	0	1	1
Begonia reniformis	0	0	0	0	2	0	0	0	0	0	0	2	2
Begonia saxicola	0	0	0	4	1	0	0	0	0	0	0	5	5
Bernardia sidoides	4	0	1	1	1	0	0	0	0	1	0	8	8
Bia lessertiana	0	1	0	0	0	0	0	0	0	0	0	1	1
Bidens bipinnata	0	0	0	0	2	0	0	0	0	1	0	3	3
Bidens pilosa	0	0	0	4	0	0	0	0	0	0	0	4	4
Bignonia binata	0	1	0	0	1	0	0	0	0	0	0	2	2
Bignonia convolvuloides	0	0	1	1	0	0	0	0	0	0	0	2	2
Bignonia ramentacea	0	0	1	0	0	0	0	0	0	0	0	1	1
Billbergia porteana	0	2	0	2	0	0	0	0	0	0	0	4	4
Blainvillea acmella	1	1	3	0	0	0	0	0	0	0	0	5	5
Blainvillea dichotoma	0	0	0	0	0	0	0	0	0	0	1	0	1
Blainvillea lanceolata	2	2	0	0	0	0	0	0	0	0	0	4	4

Blanchetiodendron blanchetii	0	0	0	0	0	2	0	0	0	0	0	2	2
Blepharodon manicatum	0	0	0	1	0	0	0	0	0	0	0	1	1
Blepharodon pictum	0	1	0	0	0	0	0	0	0	0	0	1	1
Boerhavia coccinea	2	0	1	0	1	0	0	0	0	0	0	4	4
Boerhavia diffusa	2	0	0	2	0	0	0	0	1	0	0	5	5
Bomarea edulis	0	1	0	4	2	0	0	0	0	0	0	7	7
Borreria alata	0	0	0	2	0	0	0	0	0	0	0	2	2
Borreria brownii	1	1	0	0	0	0	0	0	0	0	0	2	2
Borreria capitata	1	1	0	1	0	0	0	0	0	0	0	3	3
Borreria ocymoides	0	0	0	0	0	0	0	0	0	1	0	1	1
Borreria scabiosoides	0	0	1	0	0	0	0	0	0	0	0	1	1
Borreria verticillata	0	1	0	1	1	0	0	0	0	0	2	3	5
Bougainvillea praecox	0	0	0	0	0	3	0	0	0	0	0	3	3
Bowdichia virgilioides	0	2	0	0	0	0	0	0	0	0	0	2	2
Brasiliopuntia brasiliensis	0	0	0	0	1	0	0	0	0	0	0	1	1
Brassavola tuberculata	0	0	0	3	0	0	0	0	0	0	0	3	3
Bredemeyera brevifolia	0	3	0	0	0	0	0	0	0	0	0	3	3
Bredemeyera floribunda	0	3	0	0	0	0	1	0	0	0	0	4	4
Bredemeyera kunthiana	0	0	0	0	0	0	0	1	0	0	0	1	1
Briquetia spicata	1	1	0	0	1	0	0	0	0	0	0	3	3
Bromelia antiacantha	0	1	0	0	0	0	0	0	0	0	0	1	1
Bromelia auriculata	0	1	0	0	0	0	0	0	0	0	0	1	1
Bromelia karatas	1	4	0	2	2	0	0	0	0	0	0	9	9
Bromelia laciniosa	3	4	1	0	0	0	0	0	0	3	0	11	11
Brosimum gaudichaudii	0	3	1	0	0	0	2	0	0	0	0	6	6

Brugmansia arborea*	0	0	0	0	0	0	0	0	0	1	0	1	1
Brunfelsia cuneifolia	0	1	0	0	0	0	0	0	0	0	0	1	1
Brunfelsia uniflora	0	0	1	0	0	0	0	0	1	0	0	2	2
Buchenavia callistachya	0	1	0	0	0	0	0	0	0	0	0	1	1
Buchenavia tetraphylla	0	5	0	0	0	0	2	0	0	0	0	7	7
Bulbostylis capillaris	0	0	1	1	0	0	0	0	0	0	0	2	2
Bulbostylis hirtella	0	0	0	1	0	0	0	0	0	0	0	1	1
Bulbostylis scabra	0	0	0	4	0	0	0	0	0	0	0	4	4
Bunchosia pernambucana	0	2	0	0	0	0	0	0	0	0	0	2	2
Byrsonima correifolia	0	1	0	0	0	0	1	0	0	0	0	2	2
Byrsonima crassifolia	0	0	0	0	0	0	1	0	0	1	0	2	2
Byrsonima cydoniifolia	0	1	0	0	0	0	0	1	0	0	0	2	2
Byrsonima gardneriana	0	14	2	0	0	0	0	0	0	0	0	16	16
Byrsonima nitidifolia	0	0	0	1	0	0	0	0	0	0	0	1	1
Byrsonima sericea	0	0	0	0	0	0	2	0	0	0	0	2	2
Byrsonima vacciniifolia	0	3	0	0	0	0	0	1	0	0	0	4	4
Byttneria filipes	0	0	0	0	0	0	0	0	1	0	0	1	1
Cabomba aquatica	0	0	0	0	0	0	0	0	0	0	1	0	1
Cabralea canjerana	0	0	0	0	0	1	0	0	0	0	0	1	1
Cajanus cajan*	0	0	0	1	0	0	0	0	0	0	0	1	1
Calathea villosa	0	2	0	0	1	0	0	0	0	0	0	3	3
Callaeum psilophyllum	0	0	1	0	0	0	0	0	0	0	0	1	1
Calliandra aeschynomenoides	0	2	0	0	0	0	0	0	0	0	0	2	2
Calliandra depauperata	0	0	2	0	0	0	0	0	0	0	0	2	2
Calliandra dysantha	0	0	1	0	0	0	0	0	0	0	0	1	1

Calliandra leptopoda	0	0	1	0	0	0	0	0	0	0	0	1	1
Calliandra macrocalyx	0	1	0	0	0	0	0	0	0	0	0	1	1
Calliandra parvifolia	0	0	0	0	0	1	0	0	0	0	0	1	1
Calliandra sessilis	0	1	0	0	0	0	0	0	0	0	0	1	1
Calliandra umbellifera	0	2	1	0	0	0	0	0	0	0	0	3	3
Callisia filiformis	4	0	0	2	0	0	0	0	0	0	3	6	9
Callisia repens	0	0	1	3	0	0	0	0	0	0	0	4	4
Callisthene fasciculata	0	0	0	1	0	1	2	0	0	0	0	4	4
Callisthene major	1	0	0	0	0	0	0	0	0	0	0	1	1
Callisthene microphylla	0	1	2	1	0	0	0	0	0	0	0	4	4
Calotropis procera*	0	1	0	2	0	0	0	0	0	0	0	3	3
Calyptocarpus biaristatus*	1	0	0	0	0	0	0	0	0	0	0	1	1
Campomanesia aromatica	0	8	1	2	0	0	0	0	0	0	0	11	11
Campomanesia dichotoma	0	0	0	0	1	0	0	0	0	0	0	1	1
Campomanesia eugenioides	0	0	0	3	0	0	0	0	0	0	0	3	3
Campomanesia pubescens	0	1	0	0	0	0	0	0	0	0	0	1	1
Campomanesia velutina	0	2	0	0	0	0	0	0	0	0	0	2	2
Campomanesia viatoris	0	0	1	0	0	0	0	0	0	0	0	1	1
Campylocentrum crassirhizum	0	0	0	2	0	0	0	0	0	0	0	2	2
Canavalia brasiliensis	1	0	2	2	0	0	0	0	0	0	0	5	5
Caperonia palustris	1	0	0	0	0	0	0	0	0	0	0	1	1
Capsicum parvifolium	1	1	0	2	0	0	0	1	3	0	0	8	8
Cardiospermum anomalum	0	3	0	0	0	0	0	0	0	0	0	3	3

Cardiospermum corindum	3	4	2	2	0	0	0	0	0	1	0	12	12
Cardiospermum halicacabum	0	1	1	2	0	0	0	0	1	0	0	5	5
Cardiospermum oliveirae	0	0	0	2	0	0	0	0	0	0	0	2	2
Casearia aculeata	0	0	0	0	1	0	0	0	0	0	0	1	1
Casearia commersoniana	0	1	0	0	0	0	0	0	0	0	0	1	1
Casearia decandra	0	0	0	0	1	0	0	0	0	0	0	1	1
Casearia eichleriana	0	1	0	0	0	0	0	0	0	0	0	1	1
Casearia grandiflora	0	0	1	0	0	0	0	0	0	0	0	1	1
Casearia guianensis	0	0	0	0	0	0	0	0	1	0	0	1	1
Casearia luetzelburgii	0	0	0	1	0	0	0	0	0	0	0	1	1
Casearia resinifera	0	0	0	0	1	0	0	0	0	0	0	1	1
Casearia sylvestris	0	3	0	2	0	0	0	0	0	0	0	5	5
Casearia ulmifolia	0	0	0	0	0	0	2	0	0	0	0	2	2
Cassia ferruginea	0	0	1	0	1	0	0	0	0	0	0	2	2
Cassytha filiformis	0	1	0	1	0	0	0	0	0	0	0	2	2
Catasetum barbatum	0	1	0	1	0	0	0	0	0	0	0	2	2
Catasetum uncatum	0	0	0	2	0	0	0	0	0	0	0	2	2
Cattleya aclandiae	0	0	0	1	0	0	0	0	0	0	0	1	1
Cavanillesia hylogeiton	0	0	0	0	0	0	0	1	0	0	0	1	1
Cavanillesia umbellata	0	0	0	0	0	6	0	0	0	0	0	6	6
Cayaponia racemosa	1	1	0	1	0	0	0	0	0	0	0	3	3
Cecropia pachystachya	0	0	0	4	0	0	0	0	0	0	0	4	4
Cecropia peltata	0	0	1	0	0	0	0	0	0	0	0	1	1
Cedrela fissilis	0	0	0	0	0	5	0	0	0	0	0	5	5
Cedrela odorata	0	0	0	0	1	0	0	0	0	1	0	2	2
Ceiba erianthos	0	0	0	2	0	0	0	0	0	0	0	2	2

Ceiba glaziovii	3	0	1	0	3	0	0	0	1	2	0	10	10
Ceiba pubiflora	0	0	0	0	0	2	0	0	0	0	0	2	2
Ceiba speciosa	0	0	0	0	0	1	0	0	0	0	0	1	1
Celtis iguanaea	0	0	0	2	0	6	0	0	3	0	0	11	11
Celtis pubescens	0	1	0	0	0	1	0	0	0	0	0	2	2
Cenchrus brownii	0	0	0	0	1	0	0	0	0	0	0	1	1
Cenchrus ciliaris*	0	1	0	0	0	0	0	0	0	0	0	1	1
Cenostigma macrophyllum	0	6	2	0	0	0	0	0	0	0	0	8	8
Centratherum punctatum	4	0	2	1	0	0	0	0	1	2	3	10	13
Centrolobium sclerophyllum	0	0	0	0	0	1	0	0	0	0	0	1	1
Centrosema brasilianum	2	2	0	3	0	0	0	0	0	0	1	7	8
Centrosema pascuorum	2	0	0	0	0	0	0	0	0	0	0	2	2
Centrosema sagittatum	0	0	0	1	1	0	0	0	0	0	0	2	2
Centrosema venosum	0	0	0	1	0	0	0	0	0	0	0	1	1
Centrosema virginianum	2	1	1	1	0	0	0	0	0	0	0	5	5
Ceratopteris pteridoides	0	0	0	0	0	0	0	0	0	0	1	0	1
Ceratosanthes trifoliata	0	0	1	0	0	0	0	0	0	0	0	1	1
Cereus albicaulis	0	5	2	2	0	0	0	0	0	0	0	9	9
Cereus jamacaru	21	10	0	7	5	5	2	3	8	8	0	69	69
Cereus saddianus	0	0	0	0	0	0	0	0	0	1	0	1	1
Cestrum axillare	0	0	0	0	1	0	0	0	0	0	0	1	1
Chaetium festucoides	0	1	0	0	0	0	0	0	0	0	0	1	1
Chaetocalyx longiflora	0	0	0	0	2	0	0	0	0	0	0	2	2
Chaetocalyx scandens	1	3	1	2	0	0	0	0	0	0	0	7	7

Chamaecrista amiciella	0	0	0	1	0	0	0	0	0	0	0	1	1
Chamaecrista barbata	0	1	0	0	0	0	0	0	0	0	0	1	1
Chamaecrista belemii	0	2	1	0	0	0	0	0	0	0	0	3	3
Chamaecrista brevicalyx	0	0	1	0	0	0	0	0	0	0	0	1	1
Chamaecrista calycioides	2	0	1	0	0	0	0	0	0	0	0	3	3
Chamaecrista cytisoides	0	1	0	0	0	0	0	0	0	0	0	1	1
Chamaecrista desvauxii	1	4	1	0	0	0	0	0	0	0	0	6	6
Chamaecrista diphylla	0	1	0	0	0	0	0	0	0	0	0	1	1
Chamaecrista duckeana	2	1	0	0	0	0	0	0	0	0	0	3	3
Chamaecrista eitenorum	0	2	2	0	0	0	0	0	0	0	0	4	4
Chamaecrista fasciculata	0	1	0	0	0	0	0	0	0	0	0	1	1
Chamaecrista flexuosa	0	3	0	2	0	0	0	0	0	0	0	5	5
Chamaecrista glandulosa	0	1	0	0	0	0	0	0	0	0	0	1	1
Chamaecrista nictitans	2	4	0	2	2	0	0	0	0	0	0	10	10
Chamaecrista pilosa	0	1	0	0	0	0	0	0	0	0	0	1	1
Chamaecrista ramosa	0	3	0	0	0	0	0	0	0	0	0	3	3
Chamaecrista repens	1	2	0	0	0	0	0	0	0	0	0	3	3
Chamaecrista rotundifolia	1	1	1	1	0	0	0	0	0	0	0	4	4
Chamaecrista serpens	0	0	1	0	0	0	0	0	0	0	0	1	1
Chamaecrista supplex	1	0	0	0	0	0	0	0	0	0	0	1	1
Chamaecrista swainsonii	0	1	0	0	0	0	0	0	0	0	0	1	1

Chamaecrista tenuisepala	0	1	0	0	0	0	0	0	0	0	0	1	1
Chamaecrista trichopoda	0	0	1	0	0	0	0	0	0	0	0	1	1
Chamaecrista zygophylloides	0	2	1	0	0	0	0	0	0	0	0	3	3
Chamissoa altissima	1	0	0	0	0	0	0	0	0	0	0	1	1
Chiococca alba	0	0	0	1	1	0	0	0	0	0	0	2	2
Chloris barbata	0	0	0	0	0	0	0	0	0	0	3	0	3
Chloris exilis	0	0	0	0	0	0	0	0	0	0	1	0	1
Chloris orthonoton	0	0	0	1	0	0	0	0	0	0	0	1	1
Chloroleucon acacioides	0	1	0	0	0	0	0	0	0	0	0	1	1
Chloroleucon dumosum	0	1	2	0	0	0	0	0	1	0	0	4	4
Chloroleucon foliolosum	4	3	1	0	0	2	0	0	5	0	0	15	15
Chloroleucon mangense	2	0	1	0	0	0	0	1	0	0	0	4	4
Chloroleucon tortum	0	0	0	0	0	6	0	0	0	0	0	6	6
Chomelia martiana	0	1	0	0	0	0	0	0	0	0	0	1	1
Chomelia obtusa	0	2	0	0	0	0	2	0	0	0	0	4	4
Chresta martii	0	0	1	0	0	0	0	0	0	0	0	1	1
Chrysophyllum arenarium	0	1	0	0	0	0	0	0	0	0	0	1	1
Chrysophyllum marginatum	0	3	0	0	0	0	0	0	0	0	0	3	3
Chrysophyllum rufum	0	0	0	1	0	0	0	0	0	0	0	1	1
Cipura paludosa	0	0	1	1	0	0	0	0	0	0	0	2	2
Cissampelos andromorpha	0	0	0	1	0	0	0	0	0	0	0	1	1
Cissampelos parriera	0	0	0	0	0	0	0	0	1	0	0	1	1
Cissus albida	0	1	0	0	0	0	0	0	0	0	0	1	1
Cissus decidua	0	0	1	2	0	0	0	0	0	0	0	3	3
Cissus erosa	0	0	0	2	0	0	0	0	0	0	0	2	2

Cissus gongylodes	1	0	0	0	0	0	0	0	0	0	0	1	1
Cissus simsiana	1	0	0	6	0	0	0	0	0	0	0	7	7
Cissus subrhomboidea	0	0	0	1	0	0	0	0	0	0	0	1	1
Cissus ternata	0	1	0	0	0	0	0	0	0	0	0	1	1
Cissus tinctoria	0	1	0	0	0	0	0	0	0	0	0	1	1
Cissus verticillata	0	0	1	0	0	0	0	0	0	0	0	1	1
Clematis dioica	0	0	0	1	0	0	0	0	0	0	0	1	1
Cleome dendroides	1	0	0	0	0	0	0	0	0	0	0	1	1
Cleome latifolia	1	0	0	0	0	0	0	0	0	0	0	1	1
Cleome microcarpa	1	1	1	0	0	0	0	0	0	0	0	3	3
Cleome rosea	0	0	2	0	0	0	0	0	0	0	0	2	2
Cleome siliculifera	1	0	0	0	0	0	0	0	0	0	0	1	1
Clidemia hirta	0	1	1	2	0	0	0	0	0	0	0	4	4
Clusia hilariana	0	0	0	0	1	0	0	0	0	0	0	1	1
Clusia melchiorii	0	0	0	1	0	0	0	0	0	0	0	1	1
Clusia nemorosa	0	2	0	2	0	0	0	0	0	0	0	4	4
Clusia paralicola	0	0	0	0	1	0	0	0	0	0	0	1	1
Cnidoscolus bahianus	6	1	1	2	0	0	0	1	0	0	0	11	11
Cnidoscolus loefgrenii	2	0	0	1	0	0	0	0	1	0	0	4	4
Cnidoscolus oligandrus	0	1	0	0	0	2	0	0	0	0	0	3	3
Cnidoscolus pubescens	0	3	0	0	1	5	0	0	0	0	0	9	9
Cnidoscolus quercifolius	12	3	2	0	0	0	0	0	5	4	0	26	26
Cnidoscolus urens	3	5	3	8	2	0	0	1	1	2	0	25	25
Cnidoscolus vitifolius	0	10	2	0	0	0	0	0	0	0	0	12	12
Coccoloba conduplicata	0	0	0	0	0	0	0	1	0	0	0	1	1
Coccoloba mollis	0	0	0	0	1	0	0	0	0	0	0	1	1
Coccoloba schwackeana	0	0	0	3	0	2	0	0	0	0	0	5	5

Cochlospermum regium	1	0	0	1	0	0	0	0	2	1	0	5	5
Cochlospermum vitifolium	3	2	1	1	0	0	2	0	0	1	0	10	10
Colicodendron yco	2	1	1	2	0	0	0	2	0	0	0	8	8
Colubrina cordifolia	0	8	2	0	0	0	0	0	0	0	0	10	10
Colubrina glandulosa	0	1	0	0	0	0	0	0	0	0	0	1	1
Combretum duarteanum	0	0	0	0	0	3	2	0	0	0	0	5	5
Combretum glaucocarpum	2	7	2	0	2	0	0	1	0	0	0	14	14
Combretum hilarianum	2	2	1	0	0	0	0	0	0	0	0	5	5
Combretum lanceolatum	0	1	1	0	0	0	2	0	0	0	0	4	4
Combretum laxum	0	0	0	0	0	0	0	0	2	0	0	2	2
Combretum leprosum	12	5	0	1	0	6	2	0	5	12	0	43	43
Combretum mellifluum	0	2	0	0	0	0	2	0	0	0	0	4	4
Combretum monetaria	2	0	0	0	0	0	0	0	0	0	0	2	2
Combretum pisonioides	0	0	1	0	1	0	0	1	5	0	0	8	8
Commelina benghalensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Commelina diffusa	0	0	0	1	0	0	0	0	0	0	0	1	1
Commelina erecta	1	1	0	3	0	0	0	0	0	0	3	5	8
Commelina obliqua	2	0	2	5	1	0	0	0	0	0	0	10	10
Commelina virginica	1	0	0	0	0	0	0	0	0	0	0	1	1
Commiphora leptophloeos	27	9	2	2	4	7	0	2	5	14	0	72	72
Conocliniopsis prasiifolia	2	3	1	3	0	0	0	0	1	0	0	10	10
Conyza bonariensis	0	0	0	2	0	0	0	0	0	0	0	2	2
Copaifera coriacea	0	1	1	0	0	0	2	0	0	0	0	4	4
Copaifera	0	0	1	0	0	2	0	0	0	0	0	3	3

langsdorffii													
Copaifera martii	0	6	0	0	0	0	0	0	0	0	0	6	6
Copernicia prunifera	0	0	0	0	0	0	1	0	1	2	0	4	4
Corchorus argutus	1	0	0	0	0	0	0	0	0	1	0	2	2
Corchorus hirtus	2	0	1	0	2	0	0	0	0	0	3	5	8
Corchorus orinocensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Cordia alliodora	0	0	0	0	1	0	0	0	0	1	0	2	2
Cordia collococca	1	0	0	0	0	0	0	0	0	0	0	1	1
Cordia discolor	0	0	0	0	0	0	0	0	0	2	0	2	2
Cordia glazioviana	2	0	0	0	0	0	0	0	0	4	0	6	6
Cordia incognita	0	0	1	0	0	0	0	0	0	0	0	1	1
Cordia insignis	1	0	0	1	0	0	0	0	0	0	0	2	2
Cordia latiloba	1	0	0	2	0	0	0	0	0	0	0	3	3
Cordia magnoliifolia	0	1	0	0	0	0	0	0	0	0	0	1	1
Cordia ochnacea	0	0	0	1	0	0	0	0	0	0	0	1	1
Cordia oncocalyx	2	0	0	0	0	0	0	0	0	1	0	3	3
Cordia panicularis	0	0	2	0	0	0	0	0	0	0	0	2	2
Cordia rufescens	0	12	1	0	0	0	2	0	0	0	0	15	15
Cordia superba	0	0	0	1	0	0	0	0	0	0	1	1	2
Cordia trichotoma	2	3	2	0	0	0	0	0	4	1	0	12	12
Cordiera concolor	0	1	0	2	0	0	0	0	0	0	0	3	3
Cordiera elliptica	0	1	0	0	0	0	0	0	0	0	0	1	1
Cordiera rigida	0	1	0	1	0	0	0	0	0	0	0	2	2
Cordiera sessilis	0	1	0	2	0	0	0	0	0	0	0	3	3
Costus spiralis	0	0	0	1	0	0	0	0	0	0	0	1	1
Coutarea hexandra	2	4	0	2	3	3	1	1	1	1	0	18	18
Cranocarpus gracilis	0	2	0	0	0	0	0	0	0	0	0	2	2
Crateva tapia	1	1	0	0	0	0	0	0	2	0	0	4	4
Cratylia argentea	0	1	1	0	0	0	0	0	0	0	0	2	2
Cratylia mollis	0	9	2	0	0	0	0	0	0	0	0	11	11

Crotalaria bahiensis	0	2	0	1	0	0	0	0	0	0	0	3	3
Crotalaria holosericea	2	2	0	3	0	0	0	0	0	0	0	7	7
Crotalaria incana	0	0	1	0	0	0	0	0	0	0	0	1	1
Crotalaria lanceolata	0	0	0	3	0	0	0	0	0	0	0	3	3
Crotalaria retusa*	0	0	0	0	0	0	0	0	1	0	0	1	1
Crotalaria vitellina	0	2	0	1	0	0	0	0	0	0	0	3	3
Croton adamantinus	0	1	1	1	0	0	0	0	0	0	0	3	3
Croton adenocalyx	2	0	0	0	0	0	0	0	1	0	0	3	3
Croton adenodontus	0	1	2	0	0	0	0	0	0	0	0	3	3
Croton alagoensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Croton argyrophylloides	1	5	2	0	0	0	0	1	0	1	0	10	10
Croton argyrophyllus	0	3	0	1	1	0	0	0	0	0	0	5	5
Croton betaceus	0	4	0	0	0	0	0	0	0	0	0	4	4
Croton blanchetianus	6	1	2	0	1	0	0	0	3	3	0	16	16
Croton campestris	3	0	1	1	1	0	2	0	1	1	0	10	10
Croton celtidifolius	0	1	0	0	0	0	0	0	0	0	0	1	1
Croton compressus	0	0	0	0	1	0	0	0	0	0	0	1	1
Croton cordiifolius	0	2	0	0	0	0	0	0	0	0	0	2	2
Croton echioides	2	1	0	1	0	0	0	0	2	0	0	6	6
Croton gardnerianus	0	2	0	1	0	0	0	0	0	0	0	3	3
Croton glandulosus	6	1	1	1	0	0	0	0	0	2	0	11	11
Croton glutinosus	0	1	0	0	0	0	0	0	0	0	0	1	1
Croton grewioides	0	6	0	2	0	0	0	0	0	0	0	8	8
Croton heliotropiifolius	9	6	2	4	2	0	0	0	4	3	2	30	32
Croton hemiargyreus	0	0	0	0	0	0	0	0	0	1	0	1	1
Croton hirtus	1	0	0	2	0	0	0	0	0	0	0	3	3
Croton jacobinensis	0	3	0	1	1	0	0	0	0	0	0	5	5
Croton lundianus	1	0	0	2	0	0	1	0	0	0	0	4	4

Croton mucronifolius	1	0	0	0	0	0	0	0	0	0	0	1	1
Croton muscicarpa	0	0	0	0	1	0	0	0	0	0	0	1	1
Croton nepetifolius	0	2	0	0	1	0	0	0	0	1	0	4	4
Croton odontadenius	0	1	0	0	0	0	0	0	0	0	0	1	1
Croton pedicellatus	0	1	0	0	0	0	0	0	0	0	0	1	1
Croton piauhiensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Croton pulegiodorus	0	1	0	1	0	0	0	0	0	0	0	2	2
Croton pulegioides	0	0	0	1	1	0	0	0	0	0	0	2	2
Croton rottlerifolius	0	0	0	1	0	0	0	0	0	0	0	1	1
Croton rudolphianus	0	2	0	2	0	0	0	0	0	0	0	4	4
Croton sincorensis	1	0	0	0	0	0	0	0	0	0	0	1	1
Croton sonderianus	15	4	1	0	3	0	0	0	5	12	0	40	40
Croton tricolor	0	1	0	0	0	0	0	0	0	0	0	1	1
Croton urticifolius	0	1	2	3	1	0	0	0	1	2	0	10	10
Croton zehntneri	1	5	1	0	0	0	0	1	0	0	0	8	8
Crumenaria decumbens	3	0	1	2	0	0	0	0	0	0	0	6	6
Cryptanthus bahianus	0	0	0	0	1	0	0	0	0	0	0	1	1
Cupania impressinervia	0	1	0	2	1	0	0	0	0	0	0	4	4
Cupania racemosa	0	0	0	1	0	0	0	0	0	0	0	1	1
Cupania vernalis	0	0	0	0	0	1	0	0	0	0	0	1	1
Cuphea calophylla	1	0	0	0	0	0	0	0	0	0	0	1	1
Cuphea campestris	2	1	0	0	0	0	0	0	0	0	0	3	3
Cuphea circaeoides	2	1	0	0	0	0	0	0	0	0	0	3	3
Cuphea ericoides	0	1	0	0	0	0	0	0	0	0	0	1	1
Cuphea impatientifolia	0	0	0	0	1	0	0	0	0	0	0	1	1
Cuphea racemosa	0	0	0	0	1	0	0	0	0	0	0	1	1
Curatella americana	0	0	0	0	0	0	2	0	0	0	0	2	2
Cuspidaria argentea	0	2	0	0	0	0	0	0	0	0	0	2	2

Cybianthus penduliflorus	0	0	1	0	0	0	0	0	0	0	0	1	1
Cyclanthera elegans	0	0	0	1	0	0	0	0	0	0	0	1	1
Cymbopogon citratus	0	0	0	0	0	0	0	0	0	1	0	1	1
Cynanchum montevidense	0	0	0	0	0	0	0	0	0	0	1	0	1
Cynanchum roulinioides	0	0	1	0	0	0	0	0	0	0	0	1	1
Cynodon dactylon	0	0	1	0	0	0	0	0	0	0	0	1	1
Cynophalla flexuosa	20	4	2	3	5	0	0	0	9	7	0	50	50
Cynophalla hastata	1	1	1	1	0	0	0	0	1	1	0	6	6
Cyperus aggregatus	0	1	0	1	0	0	0	0	0	0	2	2	4
Cyperus alternifolius	0	0	0	1	0	0	0	0	0	0	0	1	1
Cyperus berroi	0	0	0	1	0	0	0	0	0	0	0	1	1
Cyperus compressus	0	0	0	0	0	0	0	0	0	0	1	0	1
Cyperus cuspidatus	2	0	0	2	0	0	0	0	0	0	0	4	4
Cyperus distans	0	0	0	0	0	0	0	0	0	0	1	0	1
Cyperus eragrostis	0	0	0	1	0	0	0	0	0	0	0	1	1
Cyperus esculentus	0	0	0	0	0	0	0	0	0	0	2	0	2
Cyperus haspan	0	0	0	0	0	0	0	0	0	0	3	0	3
Cyperus hermaphroditus	0	0	0	0	0	0	0	0	0	0	1	0	1
Cyperus iria	0	0	0	0	0	0	0	0	0	0	1	0	1
Cyperus laxus	0	2	1	2	0	0	0	0	0	0	0	5	5
Cyperus luzulae	0	0	0	1	0	0	0	0	0	0	0	1	1
Cyperus odoratus	0	0	0	2	0	0	0	0	0	0	8	2	10
Cyperus reflexus	0	1	0	0	0	0	0	0	0	0	0	1	1
Cyperus rotundus	0	0	0	1	0	0	0	0	0	0	0	1	1
Cyperus schomburgkianus	0	0	0	3	0	0	0	0	0	0	0	3	3
Cyperus surinamensis	1	0	0	1	0	0	0	0	0	0	5	2	7
Cyperus uncinulatus	4	0	2	5	1	0	0	0	0	1	0	13	13

Cyperus virens	0	0	0	0	0	0	0	0	0	0	2	0	2
Cyrtocarpa caatingae	0	0	0	0	0	1	0	0	0	0	0	1	1
Cyrtocymura harleyi	0	0	0	1	0	0	0	0	0	0	0	1	1
Cyrtocymura scorpioides	0	1	0	0	0	0	0	0	0	0	0	1	1
Cyrtopodium aliciae	0	0	0	0	1	0	0	0	0	0	0	1	1
Cyrtopodium andersonii	0	0	0	0	1	0	0	0	0	0	0	1	1
Cyrtopodium flavum	0	0	0	3	0	0	0	0	0	0	0	3	3
Cyrtopodium gigas	0	0	0	1	0	0	0	0	0	0	0	1	1
Cyrtopodium holstii	0	0	0	1	1	0	0	0	0	0	0	2	2
Cyrtopodium intermedium	0	1	0	1	0	0	0	0	0	0	0	2	2
Cyrtopodium poecilum	0	0	0	1	0	0	0	0	0	0	0	1	1
Dactylaena micrantha	0	0	1	0	0	0	0	0	0	0	0	1	1
Dactylaena microphylla	0	0	0	1	0	0	0	0	0	0	0	1	1
Dactyloctenium aegyptium	1	0	1	1	1	0	0	0	0	1	2	5	7
Dalbergia catingicola	0	2	0	0	0	0	0	0	0	0	0	2	2
Dalbergia cearensis	0	8	3	0	0	2	0	1	0	1	0	15	15
Dalbergia frutescens	0	2	1	0	0	0	0	0	0	0	0	3	3
Dalbergia glaucescens	0	0	0	0	0	0	0	1	0	0	0	1	1
Dalechampia affinis	0	1	0	0	0	0	0	0	0	0	0	1	1
Dalechampia brasiliensis	0	0	0	4	0	0	0	0	0	0	0	4	4
Dalechampia fernandesii	0	0	1	0	0	0	0	0	0	0	0	1	1
Dalechampia pernambucensis	1	1	1	1	0	0	0	0	0	0	0	4	4
Dalechampia scandens	0	1	2	1	1	0	0	0	0	0	0	5	5
Dalechampia schenckiana	0	1	0	0	0	0	0	0	0	0	0	1	1

Dasyphyllum sprengelianum	0	2	0	0	0	0	0	0	0	0	0	2	2
Datura stramonium*	0	2	0	0	0	0	0	0	0	0	0	2	2
Davilla cearensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Declieuxia fruticosa	0	1	0	0	0	0	0	0	0	0	0	1	1
Delilia biflora	4	0	1	4	2	0	0	0	0	2	2	13	15
Desmanthus virgatus	3	0	1	0	0	0	0	0	1	1	0	6	6
Desmodium distortum	0	1	0	0	0	0	0	0	0	0	0	1	1
Desmodium glabrum	0	0	0	1	1	0	0	0	0	0	0	2	2
Desmodium incanum	0	0	0	1	0	0	0	0	0	0	0	1	1
Desmodium procumbens	1	0	0	0	1	0	0	0	0	0	0	2	2
Desmodium tortuosum	0	0	0	0	0	0	0	0	0	0	1	0	1
Dichorisandra hexandra	0	2	0	3	1	0	0	0	0	0	0	6	6
Dichorisandra penduliflora	0	0	0	2	0	0	0	0	0	0	0	2	2
Dicliptera ciliaris	2	2	1	0	0	0	0	0	0	0	0	5	5
Digitaria ciliaris	0	0	0	1	0	0	0	0	0	0	1	1	2
Digitaria insularis	0	0	0	1	0	0	0	0	0	0	0	1	1
Digitaria sanguinalis	1	0	1	0	0	0	0	0	0	1	0	3	3
Dilodendron bipinnatum	0	0	0	0	0	2	0	0	0	0	0	2	2
Dimorphandra gardneriana	0	0	1	0	0	0	0	0	0	0	0	1	1
Dioclea grandiflora	2	4	2	3	2	0	0	0	0	1	0	14	14
Dioclea marginata	0	1	0	0	0	0	0	0	0	0	0	1	1
Dioclea megacarpa	0	1	0	0	0	0	0	0	0	0	0	1	1
Dioclea sclerocarpa	0	1	0	0	0	0	0	0	0	0	0	1	1
Dioclea violacea	0	5	0	1	0	0	0	0	0	0	0	6	6
Diodella apiculata	3	2	1	2	0	0	0	0	0	0	0	8	8

Diodella gardneri	0	3	0	0	0	0	0	0	0	0	0	3	3
Diodella radula	0	0	0	1	0	0	0	0	0	0	0	1	1
Diodella teres	2	2	1	0	0	0	0	0	0	1	0	6	6
Dioscorea adenantha	0	0	0	1	0	0	0	0	0	0	0	1	1
Dioscorea coronata	0	0	0	2	1	0	0	0	0	0	0	3	3
Dioscorea dodecaneura	0	0	0	1	0	0	0	0	0	0	0	1	1
Dioscorea glandulosa	0	1	0	0	0	0	0	0	0	0	0	1	1
Dioscorea hassleriana	0	0	0	1	0	0	0	0	0	0	0	1	1
Dioscorea leptostachya	0	1	0	0	0	0	0	0	0	0	0	1	1
Dioscorea ovata	0	1	2	1	0	0	0	0	0	0	0	4	4
Dioscorea piperifolia	0	0	0	1	0	0	0	0	0	0	0	1	1
Dioscorea polygonoides	0	2	0	0	1	0	0	0	0	0	0	3	3
Dioscorea sincorensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Diplopterys lutea	0	0	0	1	1	0	0	0	0	0	0	2	2
Diplopterys pubipetala	0	1	0	0	0	0	0	0	0	0	0	1	1
Diplotropis ferruginea	0	0	0	0	0	1	0	0	0	0	0	1	1
Dipteryx odorata	0	0	0	0	0	0	0	0	0	1	0	1	1
Diptychandra aurantiaca	0	0	1	0	0	0	0	0	0	0	0	1	1
Discolobium hirtum	0	0	1	0	0	0	0	0	0	0	0	1	1
Dissothrix imbricata	0	1	0	0	0	0	0	0	0	0	0	1	1
Ditassa capillaris	0	2	0	1	0	0	0	0	0	0	0	3	3
Ditassa glaziovii	1	0	0	1	0	0	0	0	0	0	0	2	2
Ditassa hastata	0	0	0	4	0	0	0	0	0	0	0	4	4
Ditassa oxyphylla	0	1	0	2	0	0	0	0	0	0	0	3	3
Ditaxis desertorum	0	0	0	1	0	0	0	0	0	0	0	1	1
Ditaxis gardneri	0	0	1	0	0	0	0	0	0	0	0	1	1

Ditaxis malpighiacea	1	0	2	0	0	0	0	0	3	0	0	6	6
Dizygostemon floribundum	0	1	0	0	0	0	0	0	0	0	0	1	1
Dodonaea viscosa	0	1	0	0	0	0	0	0	0	0	0	1	1
Dolichandra quadrivalvis	1	0	1	0	0	0	1	0	1	0	0	4	4
Dolichandra unguis-cati	1	0	0	1	0	0	0	0	0	1	0	3	3
Dorstenia asaroides	0	0	0	0	1	0	0	0	0	0	0	1	1
Doryopteris ornithopus	0	0	0	2	0	0	0	0	0	0	0	2	2
Doryopteris pedata	0	0	0	2	0	0	0	0	0	0	0	2	2
Drosera montana	0	0	0	1	0	0	0	0	0	0	0	1	1
Duguetia riedeliana	0	2	0	0	0	0	0	0	0	0	0	2	2
Duranta erecta	0	0	1	0	1	0	0	0	0	0	0	2	2
Dyckia densiflora	0	0	0	1	0	0	0	0	0	0	0	1	1
Dyckia limae	0	1	0	0	0	0	0	0	0	0	0	1	1
Dyschoriste maranhonis	0	0	0	2	0	0	0	0	0	0	0	2	2
Echinochloa colona	0	0	0	0	0	0	0	0	0	0	6	0	6
Echinodorus glandulosus	0	0	1	0	0	0	0	0	0	0	0	1	1
Echinodorus grandiflorus	0	0	0	0	0	0	0	0	0	0	3	0	3
Echinodorus subalatus	1	0	0	0	0	0	0	0	0	0	1	1	2
Echinodorus tenellus	0	0	0	0	0	0	0	0	0	0	1	0	1
Echinolaena inflexa	0	0	0	1	0	0	0	0	0	0	0	1	1
Eclipta prostrata	0	0	0	1	0	0	0	0	1	0	4	2	6
Egeria densa	0	0	0	0	0	0	0	0	0	0	3	0	3
Egletes viscosa	0	0	1	0	0	0	0	0	0	0	0	1	1
Eichhornia azurea	0	0	0	0	0	0	0	0	0	0	3	0	3
Eichhornia crassipes	0	0	0	0	0	0	0	0	0	0	8	0	8
Eichhornia paniculata	0	0	0	1	0	0	0	0	0	0	3	1	4

Eleocharis flavescens	0	0	0	1	0	0	0	0	0	0	0	1	1
Eleocharis interstincta	0	0	0	1	0	0	0	0	0	0	1	1	2
Eleocharis minima	0	0	0	0	0	0	0	0	0	0	2	0	2
Eleocharis montana	0	0	0	0	0	0	0	0	0	0	3	0	3
Elytraria imbricata	0	0	1	0	0	0	0	0	0	0	0	1	1
Emilia fosbergii	0	1	0	1	0	0	0	0	1	0	0	3	3
Emilia sonchifolia	0	0	1	2	0	0	0	0	0	0	0	3	3
Emmeorhiza umbellata	0	0	0	2	0	0	0	0	0	0	0	2	2
Encholirium erectiflorum	0	1	0	0	0	0	0	0	0	0	0	1	1
Encholirium spectabile	0	0	3	9	0	0	0	0	1	0	0	13	13
Encholirium subsecundum	0	0	0	2	0	0	0	0	0	0	0	2	2
Encyclia dichroma	0	0	0	2	0	0	0	0	0	0	0	2	2
Encyclia oncidioides	0	0	0	1	0	0	0	0	0	0	0	1	1
Enterolobium contortisiliquum	0	0	1	1	1	1	0	0	0	0	0	4	4
Enterolobium timbouva	0	0	0	0	0	1	0	0	0	0	0	1	1
Enteropogon mollis	3	0	1	1	1	0	0	0	0	1	0	7	7
Enydra radicans	0	0	0	0	0	0	0	0	0	0	3	0	3
Enydra sessilifolia	0	1	0	0	0	0	0	0	0	0	0	1	1
Ephedranthus pisocarpus	0	6	2	0	0	0	2	0	0	0	0	10	10
Epidendrum cinnabarinum	0	0	0	1	0	0	0	0	0	0	0	1	1
Epidendrum difforme	0	0	0	1	0	0	0	0	0	0	0	1	1
Epidendrum rigidum	0	0	0	1	0	0	0	0	0	0	0	1	1
Epidendrum secundum	0	0	0	1	0	0	0	0	0	0	0	1	1
Epiphyllum phyllanthus	0	0	0	1	0	0	0	0	0	0	0	1	1

Eragrostis acutiflora	0	0	1	0	0	0	0	0	0	0	0	1	1
Eragrostis ciliaris	1	0	2	0	0	0	0	0	0	1	0	4	4
Eragrostis pilosa*	1	0	1	0	0	0	0	0	0	0	2	2	4
Eragrostis rufescens	0	0	0	1	0	0	0	0	0	0	0	1	1
Eragrostis tenella	0	0	1	0	0	0	0	0	0	0	0	1	1
Eragrostis unioloides	0	0	1	0	0	0	0	0	0	0	0	1	1
Erechtites hieracifolius	0	0	0	1	0	0	0	0	0	0	0	1	1
Eremanthus capitatus	0	3	0	0	0	0	0	0	0	0	0	3	3
Eriope hypenioides	0	1	0	0	0	0	0	0	0	0	0	1	1
Eriosema glaziovii	0	0	0	0	0	0	0	0	0	1	0	1	1
Erythrina velutina	2	0	1	2	2	1	0	1	6	4	0	19	19
Erythrina verna	0	0	0	0	0	1	0	0	0	0	0	1	1
Erythrostemon calycina	0	2	0	0	0	0	0	0	0	0	0	2	2
Erythroxylum amplifolium	0	1	0	0	0	0	0	0	0	0	0	1	1
Erythroxylum barbatum	0	6	0	0	0	0	0	0	0	0	0	6	6
Erythroxylum betulaceum	0	1	3	0	0	1	0	0	0	0	0	5	5
Erythroxylum bezerrae	0	2	0	0	0	0	0	0	0	0	0	2	2
Erythroxylum caatingae	0	1	4	2	0	0	0	0	0	0	0	7	7
Erythroxylum citrifolium	0	1	0	0	0	0	0	0	0	0	0	1	1
Erythroxylum deciduum	0	0	0	0	0	3	0	0	0	0	0	3	3
Erythroxylum flaccidum	0	0	0	1	0	0	0	0	0	0	0	1	1
Erythroxylum laetevirens	0	8	0	0	0	0	0	0	0	0	0	8	8
Erythroxylum ligustrinum	0	0	0	0	0	0	0	2	0	0	0	2	2
Erythroxylum loefgrenii	0	1	0	0	0	0	0	0	0	0	0	1	1

Erythroxylum maracasense	0	0	2	0	0	0	0	0	0	0	0	2	2
Erythroxylum nummularia	0	2	0	0	0	0	0	0	0	0	0	2	2
Erythroxylum ochranthum	0	0	0	1	0	0	0	0	0	0	0	1	1
Erythroxylum pauferrense	0	0	0	0	1	0	0	0	0	1	0	2	2
Erythroxylum pulchrum	0	0	0	1	0	0	0	0	0	0	0	1	1
Erythroxylum pungens	4	1	1	0	0	0	0	0	1	0	0	7	7
Erythroxylum revolutum	1	5	0	3	0	0	0	0	3	0	0	12	12
Erythroxylum simonis	0	0	0	0	1	0	0	0	1	0	0	2	2
Erythroxylum stipulosum	0	1	0	0	0	0	0	0	0	0	0	1	1
Erythroxylum suberosum	0	1	0	2	0	0	0	0	0	0	0	3	3
Erythroxylum subracemosum	0	1	0	0	1	0	0	0	0	0	0	2	2
Erythroxylum subrotundum	0	0	0	0	1	0	0	0	0	0	0	1	1
Erythroxylum vacciniifolium	0	2	0	1	0	0	0	0	0	0	0	3	3
Esenbeckia febrifuga	0	0	0	2	0	0	0	0	0	0	0	2	2
Eugenia aurata	0	4	0	0	0	0	0	0	0	0	0	4	4
Eugenia azuruensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Eugenia biflora	0	1	0	0	0	0	0	0	0	0	0	1	1
Eugenia candolleana	0	1	0	0	0	0	0	0	0	0	0	1	1
Eugenia crenata	0	0	0	0	0	0	0	1	0	0	0	1	1
Eugenia dichroma	0	0	1	0	0	0	0	0	0	0	0	1	1
Eugenia dysenterica	0	4	0	0	0	0	0	1	0	0	0	5	5
Eugenia flavescens	0	6	2	0	0	0	0	0	0	0	0	8	8
Eugenia florida	0	0	0	0	0	7	0	0	0	0	0	7	7
Eugenia ligustrina	0	1	0	0	0	0	0	0	0	0	0	1	1

Eugenia luschnathiana	0	1	0	0	0	0	0	0	0	0	0	1	1
Eugenia mansoi	0	0	0	1	0	0	0	0	0	0	0	1	1
Eugenia pseudopsidium	0	2	0	0	0	0	0	0	0	0	0	2	2
Eugenia punicifolia	0	11	2	0	0	0	0	0	0	0	0	13	13
Eugenia pyriformis	0	1	0	0	2	0	0	0	3	0	0	6	6
Eugenia rosea	0	0	0	2	0	0	0	0	0	0	0	2	2
Eugenia stictopetala	0	11	1	0	0	0	0	0	0	0	0	12	12
Eugenia uniflora	0	0	0	0	0	1	0	0	0	0	0	1	1
Eugenia vattimoana	0	1	0	0	0	0	0	0	0	0	0	1	1
Euphorbia bahiensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Euphorbia comosa	0	7	0	4	0	0	0	0	0	0	0	11	11
Euphorbia heterophylla	2	0	0	0	0	0	0	0	0	0	0	2	2
Euphorbia hyssopifolia	6	1	1	3	0	0	0	0	0	1	2	12	14
Euphorbia insulana	1	0	1	3	1	0	0	0	0	0	0	6	6
Euphorbia phosphorea	0	0	0	3	0	0	0	0	1	0	0	4	4
Euphorbia prostrata	1	0	0	0	0	0	0	0	0	0	0	1	1
Euphorbia serpens	0	0	0	1	0	0	0	0	0	0	0	1	1
Euphorbia thymifolia	1	2	0	1	0	0	0	0	0	0	0	4	4
Euphorbia tirucalli*	0	0	0	0	0	0	0	0	1	1	0	2	2
Euphorbia tithymaloides*	0	0	0	0	1	0	0	0	0	0	0	1	1
Euploca procumbens	0	1	2	0	0	0	0	0	1	0	4	4	8
Euploca ternata	2	0	0	0	0	0	0	0	0	0	0	2	2
Evolvulus anagalloides	0	1	0	0	0	0	0	0	0	0	0	1	1
Evolvulus barbatus	0	0	1	0	0	0	0	0	0	0	0	1	1
Evolvulus cressoides	1	0	0	0	0	0	0	0	0	0	0	1	1
Evolvulus elaeagnifolius	0	2	0	0	0	0	0	0	0	0	0	2	2

Evolvulus elegans	0	2	0	0	0	0	0	0	0	0	0	2	2
Evolvulus ericaefolius	1	0	0	0	0	0	0	0	0	0	0	1	1
Evolvulus filipes	3	1	1	2	1	0	0	0	0	0	1	8	9
Evolvulus frankenioides	0	2	1	0	0	0	0	0	0	0	0	3	3
Evolvulus glomeratus	0	1	0	1	0	0	0	0	0	0	0	2	2
Evolvulus gypsophiloides	1	0	0	0	0	0	0	0	0	0	0	1	1
Evolvulus latifolius	0	1	0	0	1	0	0	0	0	0	0	2	2
Evolvulus macroblepharis	0	1	0	0	0	0	0	0	0	0	0	1	1
Evolvulus ovatus	3	1	0	0	0	0	0	0	0	1	0	5	5
Evolvulus phyllanthoides	0	1	0	0	0	0	0	0	0	0	0	1	1
Evolvulus pterocaulon	0	2	0	0	0	0	0	0	0	0	0	2	2
Evolvulus sericeus	0	2	0	0	0	0	0	0	0	0	0	2	2
Faramea montevidensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Ficus arpazusa	0	0	0	0	1	0	0	0	0	0	0	1	1
Ficus christianii	0	0	0	0	0	1	0	0	0	0	0	1	1
Ficus cyclophylla	0	0	0	1	0	0	0	0	0	0	0	1	1
Ficus elliotiana	0	0	0	1	0	0	0	0	0	0	0	1	1
Fimbristylis dichotoma	0	0	0	1	0	0	0	0	0	0	2	1	3
Fimbristylis dipsacea	0	0	0	1	0	0	0	0	0	0	0	1	1
Flaveria bidentis	2	0	0	0	0	0	0	0	0	0	0	2	2
Flueggea flexuosa	0	0	0	1	0	0	0	0	0	0	0	1	1
Foeniculum vulgare*	0	0	0	1	0	0	0	0	0	0	0	1	1
Fraunhofera multiflora	1	0	0	0	0	2	0	1	0	0	0	4	4
Fridericia bahiensis	0	0	1	0	0	0	0	0	0	0	0	1	1
Fridericia caudigera	1	0	0	0	0	0	0	0	0	0	0	1	1
Fridericia chica	0	4	0	0	0	0	0	0	0	0	0	4	4

Fridericia conjugata	0	0	0	2	0	0	0	0	0	0	0	2	2
Fridericia crassa	0	0	1	0	0	0	0	0	0	0	0	1	1
Fridericia dichotoma	1	3	2	1	0	0	1	0	0	0	0	8	8
Fridericia dispar	0	7	2	0	0	0	2	0	0	0	0	11	11
Fridericia limae	0	3	0	0	0	0	0	0	0	0	0	3	3
Fridericia parviflora	0	0	1	0	0	0	0	0	0	0	0	1	1
Fridericia platyphylla	0	1	0	0	0	0	2	0	0	0	0	3	3
Fridericia pulchella	0	1	0	0	0	0	0	0	0	0	0	1	1
Fridericia subverticillata	1	0	0	0	0	0	0	0	0	0	0	1	1
Fridericia tuberculata	0	1	0	0	0	0	0	0	0	0	0	1	1
Froelichia humboldtiana	1	2	0	1	0	0	0	0	0	2	0	6	6
Fuirena umbellata	0	0	0	1	0	0	0	0	0	0	0	1	1
Galactia jussiaeana	0	2	1	0	0	0	0	0	0	0	0	3	3
Galactia remansoana	0	1	0	0	0	0	0	0	0	0	0	1	1
Galactia striata	2	1	1	0	0	0	0	0	0	0	0	4	4
Galactia texana*	0	1	0	0	0	0	0	0	0	0	0	1	1
Galinsoga parviflora	0	0	0	1	0	0	0	0	0	0	0	1	1
Galipea trifoliata	0	1	0	0	0	0	0	0	0	0	0	1	1
Galphimia brasiliensis	0	0	0	2	0	0	0	0	0	0	0	2	2
Gamochaeta americana	0	0	0	0	0	0	0	0	0	0	1	0	1
Gaya aurea	0	0	0	0	0	0	0	0	1	1	0	2	2
Gaya gaudichaudiana	0	1	0	0	0	0	0	0	0	0	0	1	1
Gaya gracilipes	0	1	0	0	0	0	0	0	0	0	0	1	1
Gaya monosperma	1	0	0	0	0	0	0	0	0	0	0	1	1
Genipa americana	1	0	0	0	0	0	0	0	0	0	0	1	1
Geoffroea spinosa	0	0	0	0	0	0	0	0	4	0	0	4	4
Glischrothamnus ulei	0	1	0	0	0	0	0	0	0	0	0	1	1

Gochnatia blanchetiana	0	1	0	0	0	0	0	0	0	0	0	1	1
Gochnatia oligocephala	0	2	0	4	0	0	0	0	0	0	0	6	6
Godmania dardanoi	0	3	0	0	0	0	0	0	0	0	0	3	3
Gomphrena demissa	0	1	0	0	0	0	0	0	0	1	1	2	3
Gomphrena desertorum	1	0	0	0	0	0	0	0	0	0	0	1	1
Gomphrena vaga	2	1	1	4	2	0	0	0	0	0	0	10	10
Goniorrhachis marginata	0	0	0	0	0	6	0	1	0	0	0	7	7
Gouania colurnifolia	0	0	0	1	0	0	0	0	0	0	0	1	1
Gouania lupuloides	0	0	0	0	1	0	0	0	0	0	0	1	1
Guapira campestris	0	1	1	0	0	0	0	0	0	0	0	2	2
Guapira graciliflora	1	8	0	0	0	0	0	1	0	0	0	10	10
Guapira laxa	1	5	4	0	1	0	0	0	4	0	0	15	15
Guapira noxia	4	0	0	0	1	0	0	0	0	1	0	6	6
Guapira opposita	0	0	0	1	1	2	0	0	1	2	0	7	7
Guapira tomentosa	0	0	0	2	0	0	0	1	0	3	0	6	6
Guazuma ulmifolia	1	0	0	0	0	2	0	0	0	0	0	3	3
Guettarda angelica	2	1	1	3	0	1	0	0	3	0	0	11	11
Guettarda platypoda	0	0	0	1	1	0	0	1	1	0	0	4	4
Guettarda sericea	0	0	0	1	2	0	0	0	0	0	0	3	3
Guettarda viburnoides	0	2	0	0	0	0	2	0	0	0	0	4	4
Habenaria hexaptera	0	0	0	1	0	0	0	0	0	0	0	1	1
Habenaria obtusa	0	0	0	2	0	0	0	0	0	0	0	2	2
Habenaria petalodes	0	0	0	1	0	0	0	0	0	0	0	1	1
Habenaria pratensis	0	0	0	2	0	0	0	0	0	0	0	2	2
Habenaria repens	0	0	0	0	0	0	0	0	0	0	3	0	3
Habenaria trifida	0	0	0	2	0	0	0	0	0	0	0	2	2
Habranthus itaobinus	0	0	0	2	0	0	0	0	0	0	0	2	2

Habranthus ruber	0	0	0	1	0	0	0	0	0	0	0	1	1
Handroanthus chrysotrichus	0	1	0	0	0	6	0	0	0	0	0	7	7
Handroanthus heptaphyllus	0	1	0	0	0	0	0	0	0	0	0	1	1
Handroanthus impetiginosus	5	4	3	4	2	2	2	1	1	3	0	27	27
Handroanthus ochraceus	0	1	0	0	0	2	0	0	0	0	0	3	3
Handroanthus serratifolius	0	3	1	0	3	0	2	0	0	0	0	9	9
Handroanthus spongiosus	2	0	1	0	0	1	0	1	1	0	0	6	6
Harpalyce brasiliana	0	1	0	0	0	0	0	0	0	0	0	1	1
Harpochilus neesianus	0	3	0	0	0	0	0	0	0	0	0	3	3
Harpochilus phaeocarpus	0	1	0	0	0	0	0	0	0	0	0	1	1
Harrisia adscendens	3	1	0	1	0	0	0	0	1	0	0	6	6
Helichrysum indicum	0	0	0	2	0	0	0	0	0	0	0	2	2
Helicteres baruensis	4	2	2	0	0	0	0	2	1	1	0	12	12
Helicteres brevispira	0	0	0	0	0	0	0	0	1	0	0	1	1
Helicteres eichleri	0	0	0	2	1	0	0	2	1	0	0	6	6
Helicteres guazumifolia	1	0	0	0	0	0	0	0	0	0	0	1	1
Helicteres heptandra	0	2	2	0	0	0	2	0	0	0	0	6	6
Helicteres macropetala	0	0	0	0	1	0	0	0	0	0	0	1	1
Helicteres muscosa	0	8	3	0	0	0	0	0	0	0	0	11	11
Helicteres sacarolha	0	1	0	0	0	0	0	0	0	0	0	1	1
Helicteres velutina	0	5	0	0	0	0	0	0	0	0	0	5	5
Heliotropium angiospermum	0	0	1	2	1	0	0	0	1	0	1	5	6
Heliotropium indicum	1	1	0	0	0	0	0	0	0	0	3	2	5
Heliotropium	0	1	0	0	0	0	0	0	0	0	0	1	1

phylicoides													
Heliotropium transalpinum	1	0	1	0	0	0	0	0	0	0	0	2	2
Hemionitis tomentosa	0	0	0	1	0	0	0	0	0	0	0	1	1
Hemiscola aculeata	0	1	0	1	0	0	0	0	0	0	0	2	2
Hemiscola diffusa	1	2	1	1	0	0	0	0	0	0	0	5	5
Herissantia crispa	3	1	3	0	1	0	0	0	0	1	0	9	9
Herissantia nemoralis	0	0	0	0	0	0	0	0	0	1	0	1	1
Herissantia tiubae	2	2	5	2	0	0	0	0	1	0	0	12	12
Heteranthera limosa	1	0	0	0	0	0	0	0	0	0	0	1	1
Heteropterys campestris	0	0	1	0	0	0	0	0	0	0	0	1	1
Heteropterys chrysophylla	0	0	0	1	0	0	0	0	0	0	0	1	1
Heteropterys dichromocalyx	0	0	1	0	0	0	0	0	0	0	0	1	1
Heteropterys grandiflora	0	0	1	0	0	0	0	0	0	0	0	1	1
Heteropterys pteropetala	0	0	1	0	0	0	0	0	0	0	0	1	1
Heteropterys trichanthera	2	1	0	1	0	0	0	1	0	0	0	5	5
Hippeastrum solandriflorum	0	1	0	0	0	0	0	0	0	0	0	1	1
Hippeastrum stylosum	0	0	0	3	0	0	0	0	0	0	0	3	3
Hippocratea volubilis	0	0	0	2	1	0	0	0	0	0	0	3	3
Hirtella ciliata	0	2	0	0	0	0	0	0	0	0	0	2	2
Hirtella racemosa	0	2	0	1	1	0	0	0	0	0	0	4	4
Hohenbergia catingae	0	1	1	2	0	0	0	0	0	0	0	4	4
Hohenbergia leopoldo-horstii	0	0	0	1	0	0	0	0	0	0	0	1	1
Hohenbergia ridleyi	0	0	0	2	0	0	0	0	0	0	0	2	2
Hohenbergia	0	1	0	0	0	0	0	0	0	0	0	1	1

utriculosa													
Hybanthus calceolaria	1	3	0	1	0	0	0	0	0	2	0	7	7
Hydrocleis nymphoides	0	0	0	0	0	0	0	0	0	0	4	0	4
Hydrolea spinosa	0	0	1	1	0	0	0	0	0	0	7	2	9
Hymenachne amplexicaulis	0	0	0	0	0	0	0	0	0	0	4	0	4
Hymenaea aurea	0	0	2	0	0	0	0	0	0	0	0	2	2
Hymenaea courbaril	1	5	2	0	0	0	2	0	2	0	0	12	12
Hymenaea eriogyne	0	9	1	0	0	0	0	0	0	0	0	10	10
Hymenaea maranhensis	0	0	0	0	0	0	1	0	0	0	0	1	1
Hymenaea martiana	0	1	0	1	0	0	0	0	0	0	0	2	2
Hymenaea stigonocarpa	0	1	1	0	0	2	0	0	0	0	0	4	4
Hymenaea velutina	0	6	0	0	0	0	0	0	0	0	0	6	6
Hypenia salzmannii	0	3	2	0	0	0	0	0	0	0	0	5	5
Hypoxis decumbens	0	0	0	1	0	0	0	0	0	0	0	1	1
Hyptidendron amethystoides	0	1	0	0	0	0	0	0	0	0	0	1	1
Hyptis atrorubens	1	0	1	0	0	0	0	0	0	0	0	2	2
Hyptis calida	0	0	0	2	0	0	0	0	0	0	0	2	2
Hyptis dilatata	0	1	0	0	0	0	0	0	0	0	0	1	1
Hyptis fruticosa	0	3	0	4	0	0	0	0	0	0	0	7	7
Hyptis martiusii	0	6	0	0	0	0	0	1	0	0	0	7	7
Hyptis multiflora	0	0	1	0	0	0	0	0	0	0	0	1	1
Hyptis pectinata	0	0	0	1	0	0	0	0	0	0	1	1	2
Hyptis platanifolia	0	1	0	0	0	0	0	0	0	0	0	1	1
Hyptis sidifolia	0	0	0	1	0	0	0	0	0	0	0	1	1
Hyptis simulans	0	1	0	0	0	0	0	0	0	0	0	1	1
Hyptis suaveolens	2	2	1	0	0	0	0	0	0	3	1	8	9
Ichnanthus bambusiflorus	0	0	0	1	0	0	0	0	0	0	0	1	1

Ichnanthus dasycoleus	0	0	0	1	0	0	0	0	0	0	0	1	1
Ilex brevicuspis	0	0	0	0	0	3	0	0	0	0	0	3	3
Indigofera blanchetiana	0	0	0	0	0	0	0	0	0	1	0	1	1
Indigofera microcarpa	0	0	0	0	0	0	0	0	1	0	1	1	2
Indigofera suffruticosa	0	3	2	4	0	0	0	0	1	0	0	10	10
Inga capitata	0	0	0	0	1	0	0	0	0	0	0	1	1
Inga ingoides	0	1	0	0	0	0	0	0	0	0	0	1	1
Inga striata	0	0	0	0	0	0	0	0	1	0	0	1	1
Inga vera	0	0	0	1	0	0	0	0	1	0	0	2	2
Ipomoea alba	0	0	0	1	0	0	0	0	0	0	0	1	1
Ipomoea aristolochiifolia	0	0	1	0	1	0	0	0	0	0	0	2	2
Ipomoea asarifolia	0	3	0	0	1	0	0	0	1	0	3	5	8
Ipomoea bahiensis	1	1	1	1	0	0	0	0	0	2	0	6	6
Ipomoea batatoides	0	0	0	0	0	0	0	0	0	0	2	0	2
Ipomoea brasiliana	0	6	3	1	1	0	0	0	0	0	0	11	11
Ipomoea carnea	0	0	0	0	0	0	0	0	1	0	3	1	4
Ipomoea hederifolia	1	0	0	0	0	0	0	0	0	0	0	1	1
Ipomoea indica	0	0	0	1	0	0	0	0	0	0	0	1	1
Ipomoea marcellia	0	0	1	1	0	0	0	0	0	0	0	2	2
Ipomoea megapotamica	0	0	0	1	0	0	0	0	0	0	0	1	1
Ipomoea nil	1	1	1	3	0	0	0	0	0	0	0	6	6
Ipomoea pes-caprae	0	0	0	1	0	0	0	0	0	0	0	1	1
Ipomoea phyllomega	0	0	0	1	0	0	0	0	0	0	0	1	1
Ipomoea polyrhizos	1	0	0	0	0	0	0	0	0	0	0	1	1
Ipomoea procurrens	0	0	0	1	0	0	0	0	0	0	0	1	1
Ipomoea purpurea	0	0	0	1	0	0	0	0	0	0	0	1	1
Ipomoea rosea	1	1	3	2	0	0	0	0	0	0	0	7	7

Ipomoea sericophylla	1	0	0	0	0	0	0	0	0	0	0	1	1
Ipomoea setifera	0	1	0	0	0	0	0	0	0	0	0	1	1
Ipomoea setosa	0	0	0	0	0	0	0	0	0	0	1	0	1
Ipomoea subincana	0	2	2	2	0	0	0	0	0	0	0	6	6
Ipomoea subrevoluta	0	0	0	0	0	0	0	0	0	0	2	0	2
Ipomoea trifida	0	0	0	0	1	0	0	0	0	0	0	1	1
Ipomoea triloba	0	0	1	0	0	0	0	0	0	0	0	1	1
Ipomoea verbasciformis	0	0	1	0	0	0	0	0	0	0	0	1	1
Ipomoea verbascoidea	0	1	0	0	0	0	0	0	0	0	0	1	1
Ipomoea wrightii	0	0	0	0	0	0	0	0	0	0	1	0	1
Isocarpha megacephala	0	0	1	0	0	0	0	0	0	0	0	1	1
Jacaranda brasiliana	0	0	1	0	0	0	2	0	0	0	0	3	3
Jacaranda grandifoliolata	0	0	0	0	1	0	0	0	0	0	0	1	1
Jacaranda jasminoides	0	7	2	2	1	0	0	0	0	0	0	12	12
Jacaranda praetermissa	0	1	0	0	0	0	0	0	0	0	0	1	1
Jacaranda rugosa	0	2	0	1	0	0	0	0	0	0	0	3	3
Jacaratia corumbensis	0	0	1	0	0	0	0	0	0	0	0	1	1
Jacquemontia bahiensis	0	2	0	0	0	0	0	0	0	0	0	2	2
Jacquemontia cearensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Jacquemontia densiflora	1	0	1	1	0	0	0	0	0	0	1	3	4
Jacquemontia evolvuloides	1	1	0	2	0	0	0	0	0	2	0	6	6
Jacquemontia ferruginea	0	0	0	1	0	0	0	0	0	0	0	1	1
Jacquemontia glaucescens	0	0	1	0	0	0	0	0	0	0	0	1	1

Jacquemontia gracillima	2	0	0	0	0	0	0	0	0	0	0	2	2
Jacquemontia heterantha	1	0	0	0	0	0	0	0	0	0	0	1	1
Jacquemontia multiflora	0	0	0	1	0	0	0	0	0	0	0	1	1
Jacquemontia nodiflora	0	3	1	0	0	0	0	0	0	0	0	4	4
Jacquemontia pentantha	0	1	0	0	0	0	0	0	0	0	0	1	1
Jacquemontia sphaerostigma	0	0	0	0	1	0	0	0	0	0	0	1	1
Jacquemontia velutina	1	0	1	0	0	0	0	0	0	0	0	2	2
Jaegeria hirta	1	0	0	0	0	0	0	0	0	0	0	1	1
Janusia anisandra	0	1	0	0	0	0	0	0	0	0	0	1	1
Janusia janusioides	0	1	0	0	0	0	0	0	0	0	0	1	1
Janusia schwannioides	0	0	0	1	0	0	0	0	0	0	0	1	1
Jatropha curcas	0	1	0	0	0	0	0	0	0	0	0	1	1
Jatropha gossypiifolia	0	0	0	0	0	0	0	2	1	0	0	3	3
Jatropha martiusii	0	0	0	0	0	0	0	1	0	0	0	1	1
Jatropha mollissima	30	4	3	5	4	0	0	1	8	15	0	70	70
Jatropha mutabilis	2	5	1	0	0	0	0	0	1	0	0	9	9
Jatropha ribifolia	6	2	1	2	0	0	0	1	2	0	0	14	14
Justicia aequilabris	1	3	2	0	0	0	0	0	0	0	0	6	6
Justicia fragilis	0	3	0	0	0	0	0	0	0	0	0	3	3
Justicia schomburgkiana	1	0	0	0	0	0	0	0	0	0	0	1	1
Kallstroemia maxima	0	0	0	0	0	0	0	0	1	0	0	1	1
Kallstroemia tribuloides	0	2	0	0	0	0	0	0	0	0	0	2	2
Krameria tomentosa	0	2	1	0	0	0	0	0	0	0	0	3	3
Kyllinga brevifolia	0	0	0	1	0	0	0	0	0	0	0	1	1
Kyllinga odorata	0	0	0	1	0	0	0	0	0	0	0	1	1

Kyllinga squamulata	0	0	0	1	0	0	0	0	0	0	0	1	1
Lafoensia glyptocarpa	0	2	0	0	1	0	0	0	0	0	0	3	3
Lagascea mollis	3	0	1	0	0	0	0	0	0	0	0	4	4
Langsdorffia hypogaea	0	1	0	0	0	0	0	0	0	0	0	1	1
Lantana caatingensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Lantana camara	8	8	4	7	3	0	0	2	4	3	0	39	39
Lantana canescens	0	2	0	0	0	0	0	0	0	0	0	2	2
Lantana fucata	0	1	1	0	0	0	0	0	0	0	0	2	2
Lantana salzmannii	0	0	0	1	0	0	0	0	0	0	0	1	1
Laportea aestuans	1	0	0	1	0	0	0	0	0	0	0	2	2
Lasiacis anomala	0	1	0	0	0	0	0	0	0	0	0	1	1
Lasiacis ligulata	0	0	0	1	1	0	0	0	0	0	0	2	2
Lemna aequinoctialis	0	0	0	0	0	0	0	0	0	0	4	0	4
Lemna valdiviana	0	0	0	0	0	0	0	0	0	0	6	0	6
Leonotis nepetifolia	0	1	0	0	0	0	0	0	1	0	0	2	2
Lepidaploa arenaria	0	1	0	1	0	0	0	0	0	0	0	2	2
Lepidaploa chalybaea	0	2	2	3	0	0	0	0	1	0	0	8	8
Lepidaploa cotoneaster	0	0	0	1	0	0	0	0	0	0	0	1	1
Lepidaploa grisea	0	0	0	1	0	0	0	0	0	0	0	1	1
Lepidaploa lilacina	0	1	0	0	0	0	0	0	0	0	0	1	1
Lepidaploa remotiflora	0	0	1	0	0	0	0	0	0	0	0	1	1
Lepidium bonariense	0	1	0	0	0	0	0	0	0	0	0	1	1
Leptochloa fusca	0	0	0	0	0	0	0	0	0	0	2	0	2
Leptochloa panicea	2	0	0	0	0	0	0	0	0	0	0	2	2
Leptolobium dasycarpum	0	0	0	0	0	0	0	1	0	0	0	1	1
Leptoscela ruellioides	1	1	0	2	0	0	0	0	0	0	0	4	4

Lessingianthus obscurus	0	2	0	0	0	0	0	0	0	0	0	2	2
Lessingianthus rugulosus	0	1	0	0	0	0	0	0	0	0	0	1	1
Leucochloron limae	0	0	0	0	0	2	0	0	0	0	0	2	2
Libidibia ferrea	12	4	3	1	3	0	2	0	9	10	0	44	44
Licania rigida	0	0	1	0	0	0	0	0	1	2	0	4	4
Licania sclerophylla	1	0	0	0	0	0	0	0	0	0	0	1	1
Limnobium laevigatum	0	0	0	0	0	0	0	0	0	0	3	0	3
Lindackeria ovata	0	3	0	0	0	0	0	0	0	0	0	3	3
Lipocarpha micrantha	0	0	0	3	0	0	0	0	0	0	0	3	3
Lipocarpha salzmanniana	0	0	0	1	0	0	0	0	0	0	0	1	1
Lippia alba	0	0	0	1	0	0	0	0	1	0	1	2	3
Lippia gracilis	3	2	0	2	0	0	0	0	3	0	0	10	10
Lippia lasiocalycina	0	0	0	2	0	0	0	0	0	0	0	2	2
Lippia magentea	0	1	0	0	0	0	0	0	0	0	0	1	1
Lippia microphylla	2	0	0	0	0	0	0	0	0	0	0	2	2
Lippia origanoides	2	2	0	0	0	0	0	0	0	0	0	4	4
Lippia pohliana	0	0	0	2	0	0	0	0	0	0	0	2	2
Lippia riedeliana	0	1	0	0	0	0	0	0	0	0	0	1	1
Lippia schomburgkiana	0	2	0	0	0	0	0	0	0	0	0	2	2
Lippia sidoides	0	0	1	0	0	0	0	0	0	0	0	1	1
Lippia thymoides	0	1	0	0	0	0	0	1	0	0	0	2	2
Lobelia xalapensis	0	0	0	0	0	0	0	0	0	0	1	0	1
Lonchocarpus araripensis	0	4	1	0	0	0	0	0	0	0	0	5	5
Lonchocarpus campestris	0	0	0	0	0	0	0	0	1	0	0	1	1
Lonchocarpus costatus	0	0	0	0	0	2	0	0	0	0	0	2	2
Lonchocarpus obtusus	1	0	0	0	0	0	0	0	3	0	0	4	4

Lonchocarpus sericeus	1	0	1	0	0	0	0	0	5	0	0	7	7
Lonchocarpus virgilioides	0	0	0	1	0	0	0	0	0	0	0	1	1
Lourteigia ballotifolia	0	1	0	0	0	0	0	0	0	0	0	1	1
Ludwigia affinis	0	0	0	0	0	0	0	0	1	0	0	1	1
Ludwigia erecta	1	0	0	0	0	0	0	0	1	0	2	2	4
Ludwigia filiformis	0	0	0	0	0	0	0	0	0	0	2	0	2
Ludwigia helminthorrhiza	0	0	0	0	0	0	0	0	0	0	1	0	1
Ludwigia hyssopifolia	0	0	1	0	0	0	0	0	0	0	0	1	1
Ludwigia inclinata	0	0	0	0	0	0	0	0	0	0	3	0	3
Ludwigia leptocarpa	0	0	0	1	0	0	0	0	0	0	2	1	3
Luehea candicans	0	4	1	0	0	0	0	0	0	0	0	5	5
Luehea divaricata	0	0	0	0	0	2	0	0	0	0	0	2	2
Luehea grandiflora	0	0	0	0	0	0	1	1	0	0	0	2	2
Luehea paniculata	0	0	0	0	0	1	0	0	0	0	0	1	1
Luetzelburgia auriculata	2	2	2	1	0	0	2	0	3	0	0	12	12
Luziola brasiliana	0	0	0	0	0	0	0	0	0	0	1	0	1
Lycium martii	0	0	0	0	0	0	0	0	1	0	0	1	1
Machaerium aculeatum	0	0	0	0	1	3	0	0	0	0	0	4	4
Machaerium acutifolium	0	6	1	0	0	2	2	1	0	0	0	12	12
Machaerium amplum	0	1	0	0	0	0	0	0	0	0	0	1	1
Machaerium brasiliense	0	0	0	0	0	6	0	0	0	0	0	6	6
Machaerium floridum	0	0	0	0	0	1	0	0	0	0	0	1	1
Machaerium hirtum	0	0	0	0	0	2	0	0	0	0	0	2	2
Machaerium opacum	0	0	0	0	0	1	0	0	0	0	0	1	1
Machaerium	0	2	0	0	0	0	0	0	0	0	0	2	2

ovalifolium													
Machaerium scleroxylon	0	0	0	0	0	4	0	0	0	0	0	4	4
Machaerium stipitatum	0	2	0	0	0	0	0	0	0	0	0	2	2
Machaerium vestitum	0	1	0	0	0	0	0	0	0	0	0	1	1
Machaerium villosum	0	0	0	0	0	2	0	0	0	0	0	2	2
Machaonia spinosa	0	0	0	0	0	0	0	0	1	0	0	1	1
Maclura tinctoria	0	0	0	2	1	5	0	0	0	0	0	8	8
Macroptilium bracteatum	0	0	0	1	0	0	0	0	0	0	0	1	1
Macroptilium gracile	0	0	1	0	0	0	0	0	0	0	1	1	2
Macroptilium lathyroides	0	0	0	0	0	0	0	0	0	1	2	1	3
Macroptilium martii	3	1	2	1	0	0	0	0	0	2	0	9	9
Macroptilium panduratum	0	0	1	0	0	0	0	0	0	0	0	1	1
Magonia pubescens	0	3	1	0	0	0	2	1	1	0	0	8	8
Malvastrum coromandelianum	1	0	0	0	0	0	0	0	0	0	0	1	1
Malvastrum tomentosum	0	0	2	0	1	0	0	0	0	0	0	3	3
Mandevilla dardanoi	0	0	0	3	0	0	0	0	0	0	0	3	3
Mandevilla funiformis	0	0	0	2	0	0	0	0	0	0	0	2	2
Mandevilla scabra	0	2	0	3	1	0	0	0	0	0	0	6	6
Mandevilla tenuifolia	0	2	1	7	0	0	0	0	0	0	0	10	10
Manettia cordifolia	0	0	0	2	1	0	0	0	0	0	0	3	3
Manihot anomala	0	2	0	1	0	0	0	0	0	0	0	3	3
Manihot brachyandra	0	0	0	0	0	0	0	1	0	0	0	1	1
Manihot caerulescens	0	3	2	0	0	0	0	0	0	0	0	5	5
Manihot carthaginensis	4	0	2	0	2	0	0	1	1	8	0	18	18

Manihot catingae	1	0	0	0	0	0	0	0	3	0	0	4	4
Manihot dichotoma	0	3	1	0	1	0	0	0	0	0	0	5	5
Manihot epruinosa	1	0	0	1	0	0	0	0	0	0	0	2	2
Manihot gabrielensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Manihot heptaphylla	0	1	0	0	0	0	0	0	0	0	0	1	1
Manihot palmata	2	3	0	0	0	0	0	0	0	0	0	5	5
Manihot pseudoglaziovii	6	0	0	0	0	0	0	1	0	0	0	7	7
Manilkara rufula	0	2	0	0	0	0	0	0	0	0	0	2	2
Manilkara salzmannii	0	0	0	0	1	0	0	0	0	0	0	1	1
Manilkara triflora	0	1	0	0	0	0	0	0	0	0	0	1	1
Mansoa angustidens	0	0	1	0	0	0	0	0	0	0	0	1	1
Mansoa difficilis	0	2	0	0	0	0	0	0	0	0	0	2	2
Mansoa hirsuta	0	2	3	0	0	0	0	0	0	0	0	5	5
Maprounea guianensis	5	0	1	0	1	0	0	0	1	1	0	9	9
Maranta arundinacea*	0	0	0	1	0	0	0	0	0	0	0	1	1
Maranta divaricata	0	0	0	1	0	0	0	0	0	0	0	1	1
Margaritopsis carrascoana	0	2	0	0	0	0	0	0	0	0	0	2	2
Margaritopsis chaenotricha	0	0	0	0	1	0	0	0	0	0	0	1	1
Marsdenia altissima	0	0	1	0	0	0	0	0	0	0	0	1	1
Marsdenia dorothyae	1	0	0	0	0	0	0	0	0	0	0	1	1
Marsdenia loniceroides	0	0	0	4	0	0	0	0	0	0	0	4	4
Marsdenia megalantha	0	0	0	1	0	0	0	0	0	0	0	1	1
Marsypianthes chamaedrys	4	1	0	3	0	0	0	0	0	3	1	11	12
Martiodendron mediterraneum	0	0	0	0	0	0	2	0	0	0	0	2	2
Mascagnia riparia	1	0	0	0	0	0	0	0	0	0	0	1	1

Mascagnia sepium	0	0	1	0	1	0	0	0	0	0	0	2	2
Matayba guianensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Matelea ganglinosa	0	0	0	1	0	0	0	0	0	0	0	1	1
Matelea harleyi	1	0	0	0	0	0	0	0	0	0	0	1	1
Matelea maritima	0	1	1	5	1	0	0	0	0	0	0	8	8
Matelea nigra	0	0	0	1	0	0	0	0	0	0	0	1	1
Mattfeldanthus andrade-limae	0	0	1	0	0	0	0	0	0	0	0	1	1
Maytenus acanthophylla	0	0	0	1	0	0	0	0	0	0	0	1	1
Maytenus boaria	0	0	0	0	0	0	1	0	0	0	0	1	1
Maytenus catingarum	0	1	0	0	0	0	0	0	0	0	0	1	1
Maytenus horrida	0	0	0	0	0	1	0	0	0	0	0	1	1
Maytenus imbricata	0	4	0	0	0	0	0	0	0	0	0	4	4
Maytenus obtusifolia	0	0	1	0	0	0	0	0	0	0	0	1	1
Maytenus rigida	4	2	0	4	3	0	0	1	5	2	0	21	21
Megathyrsus maximus*	1	0	0	2	1	0	0	0	0	0	1	4	5
Melanthera latifolia	1	1	0	0	1	0	0	0	0	0	1	3	4
Melasma melampyroides	0	0	0	1	0	0	0	0	0	0	1	1	2
Melia azedarach*	0	0	0	0	0	0	0	1	0	0	0	1	1
Melinis minutiflora*	0	0	0	1	0	0	0	0	0	0	0	1	1
Melinis repens*	0	0	1	5	0	0	0	0	0	0	0	6	6
Melocactus bahiensis	1	1	1	3	0	0	0	0	0	2	0	8	8
Melocactus deinacanthus	0	0	0	0	0	0	0	0	0	1	0	1	1
Melocactus ernestii	0	0	0	3	0	0	0	0	0	0	0	3	3
Melocactus oreas	1	0	0	1	0	0	0	0	0	0	0	2	2
Melocactus salvadorensis	0	0	0	2	0	0	0	0	0	0	0	2	2
Melocactus zehntneri	0	2	1	0	0	0	0	0	0	0	0	3	3

Melochia arenosa	0	0	0	0	0	0	0	1	0	0	0	1	1
Melochia lanata	0	1	0	0	0	0	0	0	0	0	0	1	1
Melochia pyramidata	2	0	0	0	0	0	0	0	3	0	1	5	6
Melochia tomentosa	9	3	1	4	1	0	0	1	3	2	0	24	24
Mentzelia aspera	2	0	1	0	1	0	0	0	0	0	0	4	4
Merremia aegyptia	2	0	2	2	1	0	0	0	0	1	0	8	8
Merremia cissoides	0	0	0	1	0	0	0	0	0	0	0	1	1
Merremia dissecta	0	0	0	1	0	0	0	0	0	0	0	1	1
Merremia macrocalyx	0	0	0	3	0	0	0	0	0	1	0	4	4
Merremia umbellata	0	0	0	0	0	0	0	0	0	0	1	0	1
Miconia albicans	0	0	1	0	0	0	0	0	0	0	0	1	1
Micranthemum umbrosum	0	0	0	0	0	0	0	0	0	0	1	0	1
Microgramma geminata	0	0	0	3	0	0	0	0	0	0	0	3	3
Microgramma vacciniifolia	0	0	0	3	0	0	0	0	0	0	0	3	3
Microstachys corniculata	0	1	1	1	0	0	0	0	0	1	0	4	4
Microstachys hispida	0	1	0	0	0	0	0	0	0	0	0	1	1
Microtea glochidiata	0	0	0	1	0	0	0	0	0	0	0	1	1
Microtea longebracteata	0	0	0	0	0	0	0	0	0	0	1	0	1
Microtea maypurensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Microtea paniculata	2	3	1	1	0	0	0	0	0	0	0	7	7
Microtea scabrida	0	0	0	0	0	0	0	0	0	1	0	1	1
Mimosa acutistipula	3	3	1	0	0	0	0	0	0	1	0	8	8
Mimosa adenophylla	1	2	0	0	0	0	0	0	0	0	0	3	3
Mimosa arenosa	1	1	1	4	3	0	0	1	1	1	1	13	14
Mimosa bimucronata	0	0	0	0	0	0	0	0	1	0	0	1	1
Mimosa	1	0	0	0	0	0	0	0	0	0	0	1	1

borboremae													
Mimosa caesalpiniifolia	3	0	0	0	0	0	2	0	0	5	0	10	10
Mimosa camporum	0	0	0	1	0	0	0	0	0	0	0	1	1
Mimosa gemmulata	0	1	0	0	0	0	0	0	0	0	0	1	1
Mimosa guaranitica	0	1	0	0	0	0	0	0	0	0	0	1	1
Mimosa honesta	1	0	0	0	0	0	0	0	1	0	0	2	2
Mimosa invisa	0	2	2	1	0	0	0	0	0	0	0	5	5
Mimosa lepidophora	0	0	2	0	0	0	0	0	0	0	0	2	2
Mimosa lewisii	0	5	0	0	0	0	0	0	0	0	0	5	5
Mimosa misera	0	1	0	0	0	0	0	0	0	0	0	1	1
Mimosa modesta	0	1	0	0	0	0	0	0	0	0	0	1	1
Mimosa niederleinii	1	0	0	0	0	0	0	0	0	0	0	1	1
Mimosa nothopteris	0	0	0	0	0	0	1	0	0	0	0	1	1
Mimosa ophthalmocentra	5	0	1	1	1	0	1	0	5	1	0	15	15
Mimosa paraibana	1	0	0	2	0	0	0	0	1	0	0	4	4
Mimosa pigra	0	0	0	0	0	0	0	0	2	0	0	2	2
Mimosa pudica	0	0	0	0	0	0	0	0	0	1	2	1	3
Mimosa quadrivalvis	0	1	0	1	1	0	0	0	0	2	0	5	5
Mimosa sensitiva	0	4	1	1	1	0	0	0	0	1	0	8	8
Mimosa somnians	0	0	1	0	0	0	0	0	0	0	0	1	1
Mimosa tenuiflora	18	3	2	2	2	6	0	1	7	12	0	53	53
Mimosa ursina	1	1	0	1	0	0	0	0	0	0	0	3	3
Mimosa verrucosa	0	4	1	0	0	0	0	0	0	0	0	5	5
Mimosa xiquexiquensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Mitracarpus frigidus	0	0	0	2	0	0	0	0	0	1	0	3	3
Mitracarpus hirtus	1	1	0	0	0	0	0	0	0	0	0	2	2
Mitracarpus parvulus	0	1	0	0	0	0	0	0	0	0	0	1	1
Mitracarpus salzmannianus	2	0	1	0	0	0	0	0	0	0	0	3	3

Mitracarpus scaberulus	0	0	0	1	0	0	0	0	0	0	0	1	1
Mollugo verticillata	4	3	2	5	0	0	0	0	1	0	1	15	16
Momordica charantia*	0	0	0	2	0	0	0	0	1	0	0	3	3
Monnina insignis	0	1	0	0	0	0	0	0	0	0	0	1	1
Mouriri pusa	0	1	0	0	0	0	0	0	0	0	0	1	1
Murdannia nudiflora	2	0	0	0	0	0	0	0	0	0	0	2	2
Myracrodruon urundeuva	24	3	4	4	4	9	1	2	7	11	0	69	69
Myrcia aegiphiloides	0	1	0	0	0	0	0	0	0	0	0	1	1
Myrcia guianensis	0	3	0	0	0	0	0	0	0	0	0	3	3
Myrcia multiflora	0	3	0	0	0	0	0	0	0	0	0	3	3
Myrcia oblongata	0	1	0	0	0	0	0	0	0	0	0	1	1
Myrcia splendens	0	0	1	0	1	0	0	0	0	0	0	2	2
Myrcia tomentosa	0	1	0	0	1	0	0	0	0	0	0	2	2
Myrciaria ferruginea	0	0	2	0	0	0	0	0	0	0	0	2	2
Myroxylon peruiferum	0	0	0	0	0	0	0	0	1	0	0	1	1
Myrsine guianensis	0	0	0	0	1	0	0	0	0	0	0	1	1
Najas conferta	0	0	0	0	0	0	0	0	0	0	1	0	1
Nectandra membranacea	0	0	0	2	0	0	0	0	0	0	0	2	2
Nectandra nitidula	0	0	0	0	0	1	0	0	0	0	0	1	1
Neea obovata	0	1	0	0	0	0	0	0	0	0	0	1	1
Neocalyptrocalyx longifolium	5	2	1	1	4	0	0	2	2	1	0	18	18
Neoglaziovia variegata	4	6	3	2	0	0	0	0	0	1	0	16	16
Neojobertia candolleana	0	3	1	0	0	0	0	0	0	0	0	4	4
Neomarica gracilis	0	0	0	1	0	0	0	0	0	0	0	1	1
Nicotiana glauca	0	1	0	2	0	0	0	0	5	0	0	8	8
Noisettia orchidiflora	1	0	0	0	0	0	0	0	0	0	0	1	1

Nymphaea amazonum	0	0	0	0	0	0	0	0	0	0	1	0	1
Nymphaea ampla	0	0	0	0	0	0	0	0	0	0	6	0	6
Nymphoides indica	0	0	0	0	0	0	0	0	0	0	1	0	1
Ocimum campechianum	0	0	0	0	0	0	0	0	0	0	1	0	1
Ocotea brachybotrya	0	0	0	0	0	0	1	0	0	0	0	1	1
Ocotea duckei	0	2	0	0	0	0	0	0	0	0	0	2	2
Ocotea xanthocalyx	0	2	0	0	0	0	0	0	0	0	0	2	2
Oeceoclades maculata*	0	0	0	2	1	0	0	0	0	0	0	3	3
Oncidium baueri	0	0	0	1	0	0	0	0	0	0	0	1	1
Operculina alata	1	0	0	0	0	0	0	0	0	0	0	1	1
Operculina macrocarpa	0	0	0	1	0	0	0	0	0	0	0	1	1
Ormosia fastigiata	0	1	0	0	0	0	0	0	0	0	0	1	1
Orthophytum disjunctum	0	0	0	3	0	0	0	0	0	0	0	3	3
Orthophytum glabrum	0	0	0	1	0	0	0	0	0	0	0	1	1
Orthophytum saxicola	0	0	0	1	0	0	0	0	0	0	0	1	1
Ouratea blanchetiana	0	2	0	0	0	0	0	0	0	0	0	2	2
Ouratea cearensis	0	1	0	0	0	0	1	0	0	0	0	2	2
Ouratea discophora	0	1	0	0	0	0	0	0	0	0	0	1	1
Ouratea glaucescens	0	1	0	0	0	0	0	0	0	0	0	1	1
Ouratea parvifolia	0	1	0	0	0	0	0	0	0	0	0	1	1
Oxalis cratensis	0	0	1	1	0	0	0	0	0	0	0	2	2
Oxalis divaricata	3	2	0	2	1	0	0	0	0	0	0	8	8
Oxalis eriocarpa	0	0	1	0	0	0	0	0	0	0	0	1	1
Oxalis frutescens	0	3	0	1	0	0	0	0	0	0	0	4	4
Oxalis glaucescens	0	0	1	0	0	0	0	0	0	0	0	1	1
Oxalis hedysarifolia	0	0	0	1	0	0	0	0	0	0	0	1	1

Oxalis psoraleoides	0	0	1	0	0	0	0	1	0	0	0	2	2
Oxalis refracta	0	0	0	0	1	0	0	0	0	0	0	1	1
Oxalis sepium	0	0	1	0	0	0	0	0	0	0	0	1	1
Oxalis triangularis	0	0	1	0	0	0	0	0	0	0	0	1	1
Oxandra reticulata	0	1	0	0	0	0	0	0	0	0	0	1	1
Oxandra sessiliflora	0	1	0	0	0	0	0	0	0	0	0	1	1
Oxycaryum cubense	0	0	0	0	0	0	0	0	0	0	8	0	8
Pachira retusa	0	1	0	0	0	0	0	0	0	0	0	1	1
Paepalanthus bifidus	0	0	0	1	0	0	0	0	0	0	0	1	1
Paepalanthus lamarckii	0	0	0	1	0	0	0	0	0	0	0	1	1
Paepalanthus myocephalus	0	0	0	3	0	0	0	0	0	0	0	3	3
Paepalanthus parvus	0	0	0	1	0	0	0	0	0	0	0	1	1
Paliavana tenuiflora	0	0	0	3	0	0	0	0	0	0	0	3	3
Palicourea marcgravii	0	0	0	0	0	0	0	0	0	1	0	1	1
Panicum polygonatum	0	0	0	0	0	0	0	0	0	0	4	0	4
Panicum sellowii	0	1	0	0	0	0	0	0	0	0	0	1	1
Panicum trichoides	5	2	1	3	1	0	0	0	0	1	0	13	13
Panicum venezuelae	0	0	0	0	1	0	0	0	0	0	0	1	1
Pappophorum pappiferum	0	0	0	2	0	0	0	0	0	0	0	2	2
Parapiptadenia blanchetii	0	0	1	1	0	0	0	0	0	0	0	2	2
Parapiptadenia zehntneri	6	1	2	1	0	0	0	0	2	1	0	13	13
Parkia platycephala	0	1	0	0	0	0	1	0	0	0	0	2	2
Parkinsonia aculeata	0	0	0	1	0	0	0	0	1	0	0	2	2
Paspalidium geminatum	0	0	0	0	0	0	0	0	0	0	2	0	2
Paspalum conjugatum	0	0	0	1	0	0	0	0	0	0	0	1	1
Paspalum fimbriatum	3	0	0	0	0	0	0	0	0	0	0	3	3

Paspalum melanospermum	1	0	0	0	0	0	0	0	0	0	0	1	1
Paspalum oligostachyum	0	0	0	1	0	0	0	0	0	0	0	1	1
Paspalum parviflorum	0	0	0	1	0	0	0	0	0	0	0	1	1
Paspalum plicatulum	1	0	0	0	0	0	0	0	0	0	0	1	1
Paspalum repens	0	0	0	0	0	0	0	0	0	0	3	0	3
Paspalum scutatum	1	0	0	0	0	0	0	0	0	2	0	3	3
Passiflora alata	0	0	0	1	0	0	0	0	0	0	0	1	1
Passiflora cincinnata	0	3	1	3	0	0	0	0	0	0	0	7	7
Passiflora edmundoi	0	1	0	0	0	0	0	0	0	0	0	1	1
Passiflora foetida	2	2	3	3	0	0	0	0	0	0	0	10	10
Passiflora galbana	0	1	0	1	0	0	0	0	0	0	0	2	2
Passiflora luetzelburgii	0	4	0	1	0	0	0	0	0	0	0	5	5
Paullinia cearensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Paullinia elegans	0	3	0	0	0	0	0	0	1	0	0	4	4
Paullinia pinnata	0	0	1	2	0	0	0	0	1	0	0	4	4
Pavonia aschersoniana	0	0	0	1	0	0	0	0	0	0	0	1	1
Pavonia blanchetiana	0	2	0	0	0	0	0	0	0	0	0	2	2
Pavonia cancellata	2	2	1	3	0	0	0	0	0	2	0	10	10
Pavonia glazioviana	0	6	3	0	0	0	0	0	0	0	0	9	9
Pavonia humifusa	0	2	0	0	0	0	0	0	0	0	0	2	2
Pavonia varians	0	3	0	0	0	0	0	0	0	0	0	3	3
Pectis congesta	1	0	0	0	0	0	0	0	0	0	0	1	1
Pectis linifolia	0	0	0	1	0	0	0	0	0	0	0	1	1
Pectis oligocephala	1	0	0	0	0	0	0	0	0	0	0	1	1
Peixotoa jussieuana	0	6	2	0	0	0	0	0	0	0	0	8	8
Peltogyne confertiflora	0	3	1	0	0	0	0	0	0	0	0	4	4
Peltogyne pauciflora	0	4	0	1	0	0	0	0	2	0	0	7	7

Peltophorum dubium	0	0	0	0	0	3	0	1	0	1	0	5	5
Pennisetum pedicellatum*	0	0	0	1	0	0	0	0	0	0	0	1	1
Peperomia blanda	0	0	0	1	0	0	0	0	0	0	0	1	1
Peperomia circinnata	0	0	0	1	0	0	0	0	0	0	0	1	1
Pereskia bahiensis	0	0	0	0	0	1	0	0	0	0	0	1	1
Pereskia grandifolia	0	0	0	0	0	0	0	1	0	0	0	1	1
Periandra coccinea	0	1	0	0	0	0	0	0	0	0	0	1	1
Periandra mediterranea	0	1	0	0	0	0	0	0	0	0	0	1	1
Petalostelma martianum	0	0	0	1	0	0	0	0	0	0	0	1	1
Pfaffia denudata	0	1	0	0	0	0	0	0	0	0	0	1	1
Pfaffia glomerata	0	0	0	0	1	0	0	0	0	0	0	1	1
Philodendron acutatum	0	0	0	2	0	0	0	0	0	0	0	2	2
Philodendron bipinnatifidum	0	0	0	1	0	0	0	0	0	0	0	1	1
Philodendron imbe	0	0	0	2	0	0	0	0	0	0	0	2	2
Philodendron leal-costae	0	0	0	3	0	0	0	0	0	0	0	3	3
Phoradendron linearifolium	0	1	0	0	0	0	0	0	0	0	0	1	1
Phoradendron mucronatum	0	0	0	0	0	0	0	0	1	0	0	1	1
Phoradendron piperoides	0	2	0	0	0	0	0	0	0	0	0	2	2
Phoradendron quadrangulare	0	0	0	1	1	0	0	0	0	0	0	2	2
Phoradendron rubrum	0	1	0	0	0	0	0	0	0	0	0	1	1
Phoradendron tunaeforme	0	1	0	0	0	0	0	0	0	0	0	1	1
Phyllanthus caroliniensis	2	0	0	0	0	0	0	0	0	0	0	2	2
Phyllanthus chacoensis	0	0	0	0	0	0	0	0	1	0	0	1	1

Phyllanthus heteradenius	2	0	1	0	0	0	0	0	0	0	0	3	3
Phyllanthus niruri	2	1	1	3	1	0	0	0	0	1	0	9	9
Phyllanthus orbiculatus	2	1	0	0	0	0	0	0	0	0	0	3	3
Phyllanthus tenellus	1	0	0	0	0	0	0	0	0	0	0	1	1
Phyllostylon brasiliense	2	0	0	0	0	0	0	0	0	0	0	2	2
Physalis angulata	1	0	1	0	0	0	0	0	0	1	1	3	4
Physalis pubescens	1	0	1	1	0	0	0	0	0	0	1	3	4
Physostemon guianense	3	1	2	0	0	0	0	0	0	0	1	6	7
Physostemon lanceolatum	2	0	0	1	0	0	0	0	0	0	0	3	3
Picramnia andrade-limae	0	0	0	0	1	0	0	0	0	0	0	1	1
Picramnia bahiensis	0	0	0	0	0	0	0	1	0	0	0	1	1
Pilea hyalina	0	0	1	3	1	0	0	0	0	0	0	5	5
Pilocarpus jaborandi	0	1	2	0	0	0	0	0	0	0	0	3	3
Pilocarpus spicatus	0	1	1	0	0	0	0	0	0	0	0	2	2
Pilosocereus catingicola	0	0	0	0	0	0	0	1	0	1	0	2	2
Pilosocereus chrysostele	0	0	0	0	0	0	0	0	0	1	0	1	1
Pilosocereus glaucescens	2	0	0	0	1	0	0	0	1	2	0	6	6
Pilosocereus gounellei	15	3	1	4	2	0	1	0	8	7	0	41	41
Pilosocereus pachycladus	7	4	0	4	3	0	0	0	4	1	0	23	23
Pilosocereus pentaedrophorus	0	0	0	2	0	0	0	1	0	0	0	3	3
Pilosocereus piauhyensis	1	1	0	2	0	0	0	0	0	3	0	7	7
Pilosocereus tuberculatus	1	4	0	0	0	0	0	0	0	0	0	5	5
Piper nigrum	0	0	0	1	0	0	0	0	0	0	0	1	1
Piptadenia	0	0	0	0	0	1	0	0	0	0	0	1	1

gonoacantha													
Piptadenia macradenia	0	0	0	0	0	1	0	0	0	0	0	1	1
Piptadenia stipulacea	14	7	2	2	3	0	0	0	5	12	0	45	45
Piptadenia viridiflora	3	1	0	0	2	5	0	1	0	1	0	13	13
Piriqueta cistoides	0	1	0	0	0	0	0	0	0	0	0	1	1
Piriqueta duarteana	0	4	1	1	0	0	0	0	0	0	0	6	6
Piriqueta guianensis	1	0	0	0	0	0	0	0	0	0	0	1	1
Piriqueta racemosa	3	0	0	0	0	0	0	0	0	0	1	3	4
Piriqueta sidifolia	0	3	0	0	0	0	0	0	0	0	0	3	3
Pistia stratiotes	0	0	1	0	0	0	0	0	0	0	7	1	8
Pithecellobium diversifolium	1	0	0	0	1	0	0	0	2	0	0	4	4
Pithecellobium dulce*	0	0	0	0	0	0	0	0	1	0	0	1	1
Pithecellobium roseum	0	0	0	0	1	0	0	0	1	0	0	2	2
Pithecoseris pacourinoides	0	2	0	6	0	0	0	0	0	0	0	8	8
Pityrocarpa moniliformis	0	10	3	0	0	0	0	1	0	3	0	17	17
Pityrocarpa obliqua	1	7	1	0	0	0	0	0	0	1	0	10	10
Plathymenia reticulata	0	1	1	0	0	0	0	0	0	0	0	2	2
Platymiscium floribundum	0	0	1	0	0	4	0	0	0	0	0	5	5
Platypodanthera melissifolia	0	1	0	3	0	0	0	0	0	0	0	4	4
Platypodium elegans	0	5	2	0	0	0	0	0	0	0	0	7	7
Pleopeltis polypodioides	0	0	0	1	0	0	0	0	0	0	0	1	1
Pleurophora anomala	1	0	0	0	0	0	0	0	0	0	5	1	6
Plinia cauliflora	0	0	0	0	1	0	0	0	0	0	0	1	1
Plumbago scandens	1	1	3	4	2	0	0	0	1	0	0	12	12
Poecilanthe falcata	0	0	0	0	0	1	0	0	0	0	0	1	1

Poecilanthe grandiflora	0	0	1	0	0	0	0	0	0	0	0	1	1
Poecilanthe subcordata	0	0	0	0	0	0	0	1	0	0	0	1	1
Poecilanthe ulei	0	0	0	1	0	0	0	1	2	0	0	4	4
Poeppigia procera	0	5	3	2	0	0	0	2	1	0	0	13	13
Poincianella bracteosa	3	1	2	0	0	0	2	0	0	6	0	14	14
Poincianella gardneriana	3	0	1	1	0	0	0	0	0	0	0	5	5
Poincianella microphylla	5	6	1	0	0	6	0	1	1	0	0	20	20
Poincianella pluviosa	0	0	0	0	0	2	0	0	0	0	0	2	2
Poincianella pyramidalis	23	2	1	4	4	0	0	1	8	10	0	53	53
Polygala bracteata	1	0	0	0	0	0	0	0	0	0	0	1	1
Polygala galioides	0	1	0	0	0	0	0	0	0	0	0	1	1
Polygala glochidiata	0	0	0	1	0	0	0	0	0	0	0	1	1
Polygala gracilis	0	1	0	1	0	0	0	0	0	0	0	2	2
Polygala lancifolia	1	0	0	0	0	0	0	0	0	0	0	1	1
Polygala longicaulis	0	1	0	0	0	0	0	0	0	0	0	1	1
Polygala mollis	0	1	0	0	0	0	0	0	0	0	0	1	1
Polygala paniculata	1	2	0	2	1	0	0	0	0	0	0	6	6
Polygala pseudohebeclada	0	1	0	0	0	0	0	0	0	0	0	1	1
Polygala roubienna	0	1	0	0	0	0	0	0	0	0	0	1	1
Polygala spectabilis	0	0	0	1	0	0	0	0	0	0	0	1	1
Polygala violacea	3	0	1	1	0	0	0	0	0	1	0	6	6
Polygonum ferrugineum	0	0	0	0	0	0	0	0	0	0	6	0	6
Polygonum hispidum	0	0	0	0	0	0	0	0	1	0	2	1	3
Polystachya estrellensis	0	0	0	2	0	0	0	0	0	0	0	2	2
Porophyllum ruderale	1	0	0	0	0	0	0	0	0	0	0	1	1

Portulaca elatior	3	1	2	6	0	0	0	0	1	0	0	13	13
Portulaca grandiflora	0	1	0	0	0	0	0	0	0	0	0	1	1
Portulaca halimoides	2	0	0	4	0	0	0	0	0	0	0	6	6
Portulaca hirsutissima	0	1	0	1	0	0	0	0	0	0	0	2	2
Portulaca mucronata	0	0	2	1	0	0	0	0	0	0	1	3	4
Portulaca oleracea	2	0	1	0	1	0	0	0	0	1	0	5	5
Portulaca pilosa	1	1	0	1	0	0	0	0	0	0	0	3	3
Portulaca umbraticola	0	0	1	0	0	0	0	0	0	0	0	1	1
Pouteria gardneriana	0	0	1	0	0	0	0	0	0	0	0	1	1
Prescottia phleoides	0	0	0	3	0	0	0	0	0	0	0	3	3
Prestonia bahiensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Prestonia coalita	0	0	0	2	0	0	0	0	0	0	0	2	2
Pristimera sclerophylla	0	0	1	0	0	0	0	0	0	0	0	1	1
Priva bahiensis	0	0	0	1	0	0	0	0	0	0	1	1	2
Prockia crucis	1	1	0	0	1	0	0	0	1	0	0	4	4
Prosopis juliflora*	0	0	0	0	0	0	0	0	4	4	0	8	8
Pseudobombax grandiflorum	1	0	0	0	0	0	0	0	0	1	0	2	2
Pseudobombax marginatum	9	2	1	0	1	2	0	0	4	5	0	24	24
Pseudobombax simplicifolium	2	0	0	0	0	6	0	1	0	0	0	9	9
Psidium acutangulum	0	2	0	0	0	0	0	0	0	0	0	2	2
Psidium appendiculatum	0	1	0	2	0	0	0	0	0	0	0	3	3
Psidium guineense	0	0	0	1	1	0	0	0	0	0	0	2	2
Psidium myrsinites	0	0	0	0	0	0	2	0	0	0	0	2	2
Psidium myrtoides	0	4	0	0	0	0	0	0	0	0	0	4	4
Psidium	0	0	0	0	1	0	0	0	0	0	0	1	1

oligospermum													
Psidium riparium	0	1	0	0	1	0	0	0	0	0	0	2	2
Psidium salutare	0	1	0	0	0	0	0	0	0	0	0	1	1
Psidium sartorianum	0	2	0	0	0	0	0	0	0	0	0	2	2
Psittacanthus biternatus	0	1	0	0	0	0	0	0	0	0	0	1	1
Psittacanthus cordatus	0	2	0	2	0	0	0	0	0	0	0	4	4
Pterocarpus monophyllus	0	1	0	0	0	0	0	0	0	0	0	1	1
Pterocarpus rohrii	0	0	0	0	0	0	0	1	0	0	0	1	1
Pterocarpus villosus	0	3	0	0	0	0	0	0	0	0	0	3	3
Pterocarpus zehntneri	0	0	0	0	0	1	0	0	0	0	0	1	1
Pterodon abruptus	0	2	2	0	0	0	0	1	0	0	0	5	5
Pterogyne nitens	0	0	0	0	0	4	0	1	0	0	0	5	5
Pterolepis polygonoides	0	0	0	2	0	0	0	0	0	0	0	2	2
Pterolepis trichotoma	0	0	0	1	0	0	0	0	0	0	0	1	1
Ptilochaeta bahiensis	0	1	2	0	1	0	0	0	0	0	0	4	4
Pycreus capillifolius	0	0	0	2	0	0	0	0	0	0	0	2	2
Pycreus flavescens	0	0	0	1	0	0	0	0	0	0	0	1	1
Pycreus lanceolatus	0	0	0	0	0	0	0	0	0	0	1	0	1
Pycreus macrostachyos	0	0	0	0	0	0	0	0	0	0	1	0	1
Pycreus pelophilus	0	0	1	0	0	0	0	0	0	0	0	1	1
Pycreus piceus	0	0	0	1	0	0	0	0	0	0	0	1	1
Pycreus polystachyos	0	0	0	1	0	0	0	0	0	0	1	1	2
Pyrostegia venusta	0	2	0	1	1	0	0	0	0	0	0	4	4
Qualea grandiflora	0	0	0	0	0	0	2	0	0	0	0	2	2
Qualea parviflora	0	0	1	0	0	0	2	0	0	0	0	3	3
Randia armata	0	1	1	3	2	7	1	1	1	1	0	18	18

Randia ferox	0	0	0	0	0	0	0	0	1	0	0	1	1
Rhamnidium elaeocarpum	0	0	0	0	0	1	0	0	0	0	0	1	1
Rhamnidium molle	2	0	0	1	1	0	0	0	4	0	0	8	8
Rhaphiodon echinus	0	2	0	1	0	0	0	0	0	0	0	3	3
Rhipsalis baccifera	0	0	0	0	1	0	0	0	0	0	0	1	1
Rhipsalis lindbergiana	0	0	0	3	0	0	0	0	0	0	0	3	3
Rhynchosia minima	0	0	0	0	0	0	0	0	0	0	2	0	2
Rhynchosia phaseoloides	0	2	0	0	1	0	0	0	0	0	0	3	3
Rhynchospora barbata	0	0	0	1	0	0	0	0	0	0	0	1	1
Rhynchospora cephalotes	0	0	0	1	0	0	0	0	0	0	0	1	1
Rhynchospora contracta	0	0	0	2	0	0	0	0	0	0	4	2	6
Rhynchospora holoschoenoides	0	0	0	1	0	0	0	0	0	0	0	1	1
Rhynchospora riparia	0	0	0	1	0	0	0	0	0	0	0	1	1
Ricciocarpos natans	0	0	0	0	0	0	0	0	0	0	2	0	2
Richardia brasiliensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Richardia grandiflora	1	4	2	1	1	0	0	0	0	1	1	10	11
Richardia scabra	0	1	0	0	0	0	0	0	0	0	0	1	1
Rivina humilis	0	0	0	2	1	0	0	0	1	0	0	4	4
Rodriguezia bahiensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Romanoa tamnoides	0	0	0	1	0	0	0	0	0	0	0	1	1
Rourea martiana	0	0	0	2	0	0	0	0	0	0	0	2	2
Ruellia asperula	1	0	3	2	1	0	0	0	0	0	1	7	8
Ruellia bahiensis	0	1	1	1	2	0	0	0	0	0	1	5	6
Ruellia geminiflora	1	0	0	0	1	0	0	0	0	0	0	2	2
Ruellia paniculata	1	2	1	0	0	0	0	0	1	0	2	5	7
Ruellia villosa	0	2	0	0	0	0	0	0	0	0	0	2	2

Ruprechtia laxiflora	2	1	0	2	0	0	0	0	0	0	0	5	5
Ruprechtia ramiflora	0	1	0	0	0	0	0	0	0	0	0	1	1
Sacciolepis vilvoides	0	0	0	1	0	0	0	0	0	0	0	1	1
Salvertia convallariodora	0	0	0	0	0	0	1	0	0	0	0	1	1
Salvinia auriculata	0	0	0	0	0	0	0	0	0	0	3	0	3
Salvinia minima	0	0	0	0	0	0	0	0	0	0	4	0	4
Salvinia oblongifolia	0	0	0	0	0	0	0	0	0	0	3	0	3
Sansevieria hyacinthoides*	0	0	0	0	1	0	0	0	0	0	0	1	1
Sapindus saponaria	0	1	0	0	0	0	0	0	2	0	0	3	3
Sapium argutum	0	4	0	2	0	0	0	0	1	0	0	7	7
Sapium glandulosum	4	4	0	2	3	2	0	1	3	2	0	21	21
Sapium obovatum	0	1	0	0	0	0	0	0	0	0	0	1	1
Sapium sellowianum	0	0	0	0	0	0	0	0	0	1	0	1	1
Sarcoglottis acaulis	0	0	0	0	1	0	0	0	0	0	0	1	1
Scaphispatha gracilis	0	1	0	0	0	0	0	0	0	0	0	1	1
Scaphyglottis fusiformis	0	0	0	1	0	0	0	0	0	0	0	1	1
Schinopsis brasiliensis	12	2	3	0	4	8	0	3	8	5	0	45	45
Schizachyrium brevifolium	0	0	0	1	0	0	0	0	0	0	0	1	1
Schoepfia brasiliensis	0	2	0	1	2	0	0	0	0	0	0	5	5
Schubertia multiflora	0	1	0	0	0	0	0	0	0	0	0	1	1
Schultesia guianensis	0	0	0	3	0	0	0	0	0	0	0	3	3
Schwartzia brasiliensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Schwenckia americana	0	0	1	2	0	0	0	0	0	1	0	4	4
Scleria interrupta	0	0	0	1	0	0	0	0	0	0	0	1	1
Scleria reticularis	0	0	0	1	0	0	0	0	0	0	0	1	1
Scleria secans	0	0	0	1	0	0	0	0	0	0	0	1	1

Scoparia dulcis	2	0	1	1	0	0	0	0	0	0	1	4	5
Sebastiania brasiliensis	0	3	1	0	0	0	0	0	0	0	0	4	4
Sebastiania brevifolia	0	1	0	0	0	0	0	0	0	0	0	1	1
Sebastiania commersoniana	1	0	0	0	0	0	0	0	0	0	0	1	1
Sebastiania macrocarpa	3	0	0	0	0	0	0	0	4	0	0	7	7
Secondatia floribunda	0	2	0	0	0	0	0	0	0	0	0	2	2
Securidaca diversifolia	0	0	0	3	0	0	0	0	0	0	0	3	3
Securidaca volubilis	0	1	0	0	0	0	0	0	0	0	0	1	1
Selaginella convoluta	4	0	0	1	0	0	0	0	0	1	0	6	6
Selaginella potaroensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Selaginella sellowii	1	0	0	0	0	0	0	0	0	0	0	1	1
Selaginella sulcata	0	0	0	0	1	0	0	0	0	0	0	1	1
Senegalia bahiensis	0	1	0	3	1	4	0	0	0	0	0	9	9
Senegalia langsdorffii	0	8	3	1	0	1	0	1	0	0	0	14	14
Senegalia martii	0	0	0	0	0	1	0	0	0	0	0	1	1
Senegalia martiusiana	0	1	0	0	0	0	0	0	0	0	0	1	1
Senegalia monacantha	0	0	0	0	0	1	0	0	0	0	0	1	1
Senegalia piauhiensis	1	4	1	0	0	0	0	2	0	0	0	8	8
Senegalia polyphylla	0	3	2	1	4	1	0	1	0	2	0	14	14
Senegalia riparia	0	1	1	1	0	0	0	1	0	1	0	5	5
Senegalia tenuifolia	3	3	1	0	1	1	0	1	1	0	0	11	11
Senna acuruensis	0	3	0	0	0	0	2	1	0	0	0	6	6
Senna angulata	0	1	0	0	1	0	0	0	0	0	0	2	2
Senna aversiflora	0	0	0	2	0	0	0	0	0	0	0	2	2
Senna cana	0	4	0	0	0	0	0	1	0	0	0	5	5

Senna catingae	0	0	0	0	0	0	0	1	0	0	0	1	1
Senna cearensis	0	8	2	0	0	0	0	0	0	0	0	10	10
Senna gardneri	0	5	2	1	0	0	0	0	0	0	0	8	8
Senna georgica	0	0	0	0	0	0	0	0	0	1	0	1	1
Senna lechriosperma	0	2	0	0	0	0	0	0	0	0	0	2	2
Senna macranthera	4	10	3	3	0	1	0	0	4	1	0	26	26
Senna martiana	2	0	0	5	0	0	0	0	2	0	0	9	9
Senna multijuga	0	0	0	0	0	0	0	0	0	1	0	1	1
Senna obtusifolia	1	0	0	0	0	0	0	0	0	2	1	3	4
Senna occidentalis	0	1	1	0	0	0	0	0	0	0	0	2	2
Senna rizzinii	3	4	1	1	0	0	0	1	0	2	0	12	12
Senna rugosa	0	2	0	0	0	0	0	0	0	0	0	2	2
Senna spectabilis	4	4	4	2	2	5	0	1	5	1	0	28	28
Senna splendida	0	5	1	0	1	0	0	1	1	0	0	9	9
Senna trachypus	2	8	3	0	0	0	0	0	0	0	0	13	13
Senna uniflora	3	0	1	0	0	0	0	0	0	1	4	5	9
Senna velutina	0	1	1	0	0	0	0	0	0	0	0	2	2
Serjania caracasana	0	1	0	0	0	0	0	0	0	0	0	1	1
Serjania comata	0	1	0	0	0	0	0	0	0	0	0	1	1
Serjania glabrata	0	3	2	2	2	0	0	0	1	0	0	10	10
Serjania hebecarpa	0	1	0	1	0	0	0	0	0	0	0	2	2
Serjania lethalis	0	4	0	0	0	0	0	0	0	0	0	4	4
Serjania marginata	0	1	0	0	0	0	0	0	0	0	0	1	1
Serjania pernambucensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Serpocaulon triseriale	0	0	0	1	0	0	0	0	0	0	0	1	1
Sesbania exasperata	0	0	0	0	0	0	0	0	1	0	0	1	1
Sesbania virgata	1	0	0	0	0	0	0	0	0	0	0	1	1
Setaria parviflora	1	2	0	2	0	0	0	0	0	1	0	6	6
Setaria pauciflora	0	1	0	0	0	0	0	0	0	0	0	1	1

Setaria setosa	0	2	0	1	0	0	0	0	0	0	0	3	3
Setaria tenax	1	1	0	0	0	0	0	0	0	0	0	2	2
Sida acuta	0	0	0	0	1	0	0	0	0	0	0	1	1
Sida angustissima	0	0	0	0	0	0	0	0	0	1	0	1	1
Sida anomala	0	0	0	0	0	0	0	0	0	1	0	1	1
Sida blepharoprion	0	0	0	1	0	0	0	0	0	0	0	1	1
Sida castanocarpa	1	0	0	0	0	0	0	0	0	0	0	1	1
Sida ciliaris	2	1	0	0	0	0	0	0	0	0	0	3	3
Sida cordifolia	3	1	4	0	0	0	0	0	0	1	0	9	9
Sida galheirensis	2	6	3	4	0	0	0	0	0	0	0	15	15
Sida glomerata	0	1	1	0	2	0	0	0	0	0	0	4	4
Sida jussiaeana	1	0	0	0	0	0	0	0	0	0	0	1	1
Sida linifolia	0	1	0	1	0	0	0	0	0	0	0	2	2
Sida regnellii	0	0	1	0	0	0	0	0	0	0	0	1	1
Sida rhombifolia	0	0	0	0	0	0	0	0	0	1	0	1	1
Sida rubifolia	0	1	0	0	0	0	0	0	0	0	0	1	1
Sida salviifolia	0	0	1	0	0	0	0	0	0	0	0	1	1
Sida spinosa	0	0	1	0	0	0	0	0	0	1	3	2	5
Sida ulei	0	1	0	0	0	0	0	0	0	0	0	1	1
Sidastrum micranthum	0	0	1	0	0	0	0	0	0	0	0	1	1
Sidastrum multiflorum	0	0	0	1	2	0	0	0	0	0	0	3	3
Sidastrum paniculatum	0	2	0	4	1	0	0	0	0	0	0	7	7
Sideroxylon obtusifolium	7	3	0	2	0	0	0	0	8	5	0	25	25
Simaba ferruginea	0	1	0	0	0	0	0	0	0	0	0	1	1
Simaba floribunda	0	4	0	0	0	0	0	0	0	0	0	4	4
Simarouba amara	0	2	0	0	0	0	0	0	0	0	0	2	2
Simarouba versicolor	0	0	0	0	0	0	2	0	0	0	0	2	2
Sinningia incarnata	0	0	0	1	0	0	0	0	0	0	0	1	1

Sinningia nordestina	0	0	0	3	0	0	0	0	0	0	0	3	3
Skytanthus hancorniifolius	0	1	0	1	0	0	0	0	0	0	0	2	2
Smilax brasiliensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Smilax campestris	0	0	0	1	0	0	0	0	0	0	0	1	1
Sobralia liliastrum	0	0	0	1	0	0	0	0	0	0	0	1	1
Solanum agrarium	1	0	1	0	0	0	0	0	0	0	0	2	2
Solanum americanum	0	2	0	1	0	0	0	0	0	0	0	3	3
Solanum asperum	0	0	0	1	1	0	0	0	0	0	0	2	2
Solanum bahianum	0	1	0	0	0	0	0	0	0	0	0	1	1
Solanum capsicoides	0	0	0	1	0	0	0	0	0	0	0	1	1
Solanum crinitum	0	3	0	0	0	0	0	0	0	0	0	3	3
Solanum flaccidum	0	2	0	0	0	0	0	0	0	0	0	2	2
Solanum jabrense	1	0	0	0	0	0	0	0	0	0	0	1	1
Solanum megalonyx	0	0	0	2	0	0	0	0	0	0	0	2	2
Solanum paludosum	0	0	1	1	0	0	0	0	0	0	0	2	2
Solanum paniculatum	0	5	2	3	0	0	0	0	1	1	1	12	13
Solanum rhytidoandrum	1	5	2	1	0	0	0	0	1	0	0	10	10
Solanum stipulaceum	0	4	0	1	0	0	0	0	0	0	0	5	5
Solanum thomasiifolium	0	1	0	1	0	0	0	0	0	0	0	2	2
Sonchus oleraceus	0	0	0	0	0	0	0	0	0	0	1	0	1
Spananthe paniculata	0	0	0	1	0	0	0	0	0	0	0	1	1
Spathicarpa hastifolia	0	1	0	0	0	0	0	0	0	0	0	1	1
Spergularia marina	0	0	0	0	0	0	0	0	1	0	0	1	1
Spermacoce spiralis	1	0	0	0	0	0	0	0	0	0	0	1	1
Spigelia anthelmia	2	0	0	0	0	0	0	0	0	0	0	2	2
Spondias tuberosa	15	3	3	4	3	6	0	3	6	5	0	48	48
Sporobolus	0	0	0	2	0	0	0	0	0	0	0	2	2

pyramidatus													
Stachytarpheta angustifolia	0	0	0	1	0	0	0	0	0	0	5	1	6
Stachytarpheta cayennensis	2	1	0	0	0	0	0	0	0	0	0	3	3
Stachytarpheta coccinea	1	1	0	0	0	0	0	0	0	0	0	2	2
Stachytarpheta microphylla	1	0	1	0	0	0	0	0	0	0	0	2	2
Stachytarpheta sessilis	1	0	0	0	0	0	0	0	0	0	0	1	1
Staelia aurea	0	1	0	0	0	0	0	0	0	0	0	1	1
Staelia virgata	1	0	2	0	0	0	0	0	0	0	0	3	3
Steirachne diandra	0	1	0	0	0	0	0	0	0	0	0	1	1
Stemodia maritima	0	0	0	0	0	0	0	0	1	0	1	1	2
Stemodia pratensis	0	0	0	1	0	0	0	0	0	0	1	1	2
Sterculia striata	0	0	0	0	0	7	0	0	0	0	0	7	7
Stigmaphyllon auriculatum	1	1	0	1	0	0	0	0	0	0	0	3	3
Stigmaphyllon blanchetii	0	0	0	1	0	0	0	0	0	0	0	1	1
Stigmaphyllon cavernulosum	0	0	1	0	0	0	0	0	0	0	0	1	1
Stigmaphyllon paralias	0	4	0	2	0	0	0	0	0	0	0	6	6
Stigmaphyllon rotundifolium	0	0	0	1	0	0	0	0	0	0	0	1	1
Stillingia trapezoidea	0	3	2	2	0	0	0	0	0	0	0	7	7
Stillingia uleana	0	1	0	0	0	0	0	0	0	0	0	1	1
Stizophyllum perforatum	0	0	0	0	0	0	1	0	0	0	0	1	1
Streptostachys asperifolia	0	4	0	0	0	0	0	0	0	0	0	4	4
Struthanthus flexicaulis	0	1	0	0	0	0	0	0	0	0	0	1	1
Struthanthus polyrhizus	0	3	0	0	0	0	0	0	0	0	0	3	3
Struthanthus	0	4	0	0	0	0	0	0	0	0	0	4	4

syringifolius												
Strychnos parvifolia	0	0	0	1	1	0	0	0	0	0	0	2	2
Strychnos rubiginosa	0	9	2	0	0	0	0	0	0	0	0	11	11
Stryphnodendron coriaceum	0	0	0	0	0	0	1	0	0	0	0	1	1
Stylosanthes angustifolia	1	0	0	0	0	0	0	0	0	1	0	2	2
Stylosanthes capitata	0	2	0	0	0	0	0	0	0	0	0	2	2
Stylosanthes guianensis	0	0	0	0	0	0	0	0	1	0	2	1	3
Stylosanthes humilis	2	0	0	1	0	0	0	0	0	0	0	3	3
Stylosanthes scabra	1	0	0	1	0	0	0	0	0	0	1	2	3
Stylosanthes viscosa	1	2	0	3	0	0	0	0	0	0	0	6	6
Swartzia flaemingii	0	9	2	0	0	0	0	0	0	0	0	11	11
Syagrus coronata	0	0	1	3	0	0	0	2	0	1	0	7	7
Syagrus oleracea	2	0	0	0	0	7	0	0	0	0	0	9	9
Syagrus vagans	0	0	0	2	0	0	0	0	0	0	0	2	2
Tabebuia aurea	1	0	0	1	0	0	1	1	5	5	0	14	14
Tabebuia reticulata	0	0	0	0	0	1	0	0	0	0	0	1	1
Tabebuia roseoalba	0	0	0	0	0	8	0	0	0	0	0	8	8
Tabernaemontana catharinensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Tabernaemontana hystrix	0	0	0	0	0	0	2	0	0	0	0	2	2
Taccarum peregrinum	2	1	0	0	0	0	0	0	0	0	0	3	3
Tachigali aurea	0	0	0	0	0	0	1	0	0	0	0	1	1
Tachigali densiflora	0	0	1	0	0	0	0	0	0	0	0	1	1
Tacinga inamoena	4	6	2	4	0	0	0	0	1	3	0	20	20
Tacinga palmadora	13	2	1	2	2	0	0	2	0	2	0	24	24
Talinum paniculatum	1	1	0	3	1	0	0	0	0	0	0	6	6
Talinum triangulare	1	1	1	2	1	0	0	0	0	0	0	6	6
Talisia esculenta	0	2	1	0	1	2	0	0	0	0	0	6	6

Tanaecium cyrtanthum	0	0	1	0	0	0	0	0	0	0	0	1	1
Tanaecium pyramidatum	0	0	0	0	1	0	0	0	0	0	0	1	1
Tarenaya spinosa	0	0	1	0	0	0	0	0	1	1	4	3	7
Tassadia burchellii	0	1	0	0	0	0	0	0	0	0	0	1	1
Temnadenia violacea	0	2	0	0	0	0	0	0	0	0	0	2	2
Tephrosia cinerea	0	0	0	0	0	0	0	0	0	1	1	1	2
Tephrosia purpurea	0	0	0	0	0	0	0	0	0	0	1	0	1
Terminalia actinophylla	0	1	0	0	0	0	2	0	0	0	0	3	3
Terminalia fagifolia	0	0	0	0	0	1	1	1	0	0	0	3	3
Tetraulacium veroniciforme	0	0	1	0	0	0	0	0	0	1	0	2	2
Thelypteris interrupta	0	0	0	0	0	0	0	0	0	0	3	0	3
Thryallis longifolia	0	0	0	2	0	0	0	0	0	0	0	2	2
Tibouchina heteromalla	0	2	0	3	0	0	0	0	0	0	0	5	5
Tibouchina lithophila	0	0	0	1	0	0	0	0	0	0	0	1	1
Tibouchina mutabilis	0	0	0	1	0	0	0	0	0	0	0	1	1
Tilesia baccata	0	2	0	0	1	0	0	0	0	0	0	3	3
Tillandsia didisticha	0	0	0	1	0	0	0	0	0	0	0	1	1
Tillandsia gardneri	0	1	0	4	0	0	0	0	0	0	0	5	5
Tillandsia loliacea	2	2	1	2	0	0	0	0	0	0	0	7	7
Tillandsia polystachia	0	0	0	1	0	0	0	0	0	0	0	1	1
Tillandsia recurvata	2	4	0	8	0	0	0	0	0	0	0	14	14
Tillandsia streptocarpa	2	3	1	3	0	0	0	0	0	0	0	9	9
Tillandsia stricta	0	0	0	2	0	0	0	0	0	0	0	2	2
Tillandsia tenuifolia	0	1	0	2	0	0	0	0	0	0	0	3	3
Tillandsia usneoides	0	1	0	2	0	0	0	0	0	0	0	3	3
Tocoyena formosa	1	5	2	6	2	0	0	0	5	0	0	21	21

Tocoyena hispidula	0	0	0	0	0	0	1	0	0	0	0	1	1
Tocoyena sellowiana	0	0	0	0	0	0	1	0	3	0	0	4	4
Tournefortia bicolor	0	0	0	1	0	0	0	0	0	0	0	1	1
Tournefortia paniculata	1	0	0	0	0	0	0	0	0	0	0	1	1
Tournefortia rubicunda	1	1	0	1	1	0	0	0	2	0	0	6	6
Tournefortia salzmannii	0	0	1	1	0	0	0	0	0	0	0	2	2
Tournefortia villosa	0	0	0	2	0	0	0	0	0	0	0	2	2
Trachypogon spicatus	0	0	0	1	0	0	0	0	0	0	0	1	1
Tradescantia ambigua	0	0	0	2	0	0	0	0	0	0	0	2	2
Tragia friesii	0	0	0	1	0	0	0	0	0	0	0	1	1
Tragia volubilis	1	0	1	3	1	0	0	0	0	0	0	6	6
Tragus berteronianus	3	1	1	1	0	0	0	0	0	0	0	6	6
Trema micrantha	0	2	1	4	0	0	0	0	0	0	0	7	7
Trianthema portulacastrum	1	0	0	0	0	0	0	0	0	0	0	1	1
Trichilia elegans	0	3	0	0	0	0	0	0	0	0	0	3	3
Trichilia hirta	0	0	1	1	0	6	0	0	0	0	0	8	8
Trichogonia menthifolia	0	1	0	0	0	0	0	0	0	0	0	1	1
Trichogoniopsis podocarpa	0	1	0	0	0	0	0	0	0	0	0	1	1
Tridax procumbens	2	1	2	3	0	0	0	0	1	0	0	9	9
Trigonia bahiensis	0	1	0	0	0	0	0	0	0	0	0	1	1
Trigonia nivea	0	3	0	1	0	0	0	1	0	0	0	5	5
Trilepis lhotzkiana	0	0	0	2	0	0	0	0	0	0	0	2	2
Triplaris gardneriana	1	0	2	0	0	1	0	1	6	1	0	12	12
Triplaris physocalyx	0	0	0	0	0	0	0	1	0	0	0	1	1
Triplaris weigeltiana	0	0	0	0	0	0	1	0	0	0	0	1	1
Tripogon spicatus	2	0	0	0	0	0	0	0	0	0	0	2	2

Trischidium decipiens	0	2	0	0	0	0	0	0	0	0	0	2	2
Trischidium molle	0	10	3	0	0	0	0	0	0	0	0	13	13
Triumfetta semitriloba	0	0	0	0	1	0	0	0	0	0	0	1	1
Trixis vauthieri	0	0	0	2	0	0	0	0	0	0	0	2	2
Turbina cordata	0	4	0	0	0	0	0	0	0	0	0	4	4
Turnera blanchetiana	0	7	1	1	0	0	0	0	0	0	0	9	9
Turnera calyptrocarpa	0	0	2	2	0	0	0	0	0	0	0	4	4
Turnera cearensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Turnera chamaedrifolia	0	1	0	1	0	0	0	0	0	0	0	2	2
Turnera coerulea	0	2	0	0	0	0	0	0	0	0	0	2	2
Turnera diffusa	0	5	0	0	0	0	0	0	0	0	0	5	5
Turnera macrophylla	1	0	0	0	0	0	0	0	0	0	0	1	1
Turnera opifera	0	1	0	0	0	0	0	0	0	0	0	1	1
Turnera pumilea	3	0	0	0	0	0	0	0	0	1	0	4	4
Turnera subulata	1	0	0	1	0	0	0	0	0	0	0	2	2
Turnera ulmifolia	0	0	2	2	0	0	0	0	1	1	0	6	6
Typha domingensis	0	0	0	0	0	0	0	0	0	0	4	0	4
Unxia camphorata	0	1	0	0	0	0	0	0	0	0	0	1	1
Urochloa fusca*	1	0	0	1	0	0	0	0	0	0	0	2	2
Urochloa mollis*	3	0	0	0	0	0	0	0	0	1	0	4	4
Urochloa mutica*	0	0	0	0	0	0	0	0	0	0	1	0	1
Urochloa plantaginea*	0	0	0	1	0	0	0	0	0	0	1	1	2
Urvillea laevis	0	1	0	1	0	0	0	0	0	0	0	2	2
Urvillea ulmacea	0	1	0	0	0	0	0	0	0	0	0	1	1
Utricularia breviscapa	0	0	0	0	0	0	0	0	0	0	1	0	1
Utricularia foliosa	0	0	0	0	0	0	0	0	0	0	1	0	1
Utricularia gibba	0	0	0	0	0	0	0	0	0	0	5	0	5

Utricularia nigrescens	0	0	0	1	0	0	0	0	0	0	0	1	1
Utricularia pusilla	0	0	0	1	0	0	0	0	0	0	0	1	1
Vachellia farnesiana	1	0	0	0	1	0	0	0	1	1	0	4	4
Vanilla chamissonis	0	0	0	0	1	0	0	0	0	0	0	1	1
Vanilla palmarum	0	1	0	2	0	0	0	0	0	0	0	3	3
Varronia curassavica	0	1	0	2	0	0	0	0	1	0	0	4	4
Varronia dardani	0	0	0	1	0	0	0	0	0	0	0	1	1
Varronia globosa	9	2	1	3	5	0	0	0	4	2	0	26	26
Varronia leucocephala	9	5	4	1	0	0	0	0	1	0	0	20	20
Varronia leucomalloides	0	4	0	0	0	0	0	0	0	0	0	4	4
Varronia multispicata	1	0	0	1	0	0	0	0	0	0	0	2	2
Varronia nivea	0	0	0	0	0	0	0	1	0	0	0	1	1
Vatairea macrocarpa	0	1	0	0	0	0	0	0	0	0	0	1	1
Vellozia plicata	0	0	1	3	0	0	0	0	0	0	0	4	4
Verbesina macrophylla	0	0	0	0	1	0	0	0	0	0	0	1	1
Vigna halophila	0	0	0	1	0	0	0	0	0	0	0	1	1
Vigna peduncularis	0	1	1	2	2	0	0	0	0	0	0	6	6
Vismia guianensis	0	0	0	1	0	0	0	0	0	0	0	1	1
Vismia micrantha	0	0	0	0	0	0	0	1	0	0	0	1	1
Vitex cymosa	0	2	0	0	0	1	2	0	0	0	0	5	5
Vitex gardneriana	0	0	0	0	0	0	0	0	5	0	0	5	5
Vitex polygama	0	0	0	0	0	1	0	0	0	0	0	1	1
Vitex rufescens	0	0	0	3	0	0	0	0	0	0	0	3	3
Vitex schaueriana	1	2	0	0	0	0	0	0	0	0	0	3	3
Waltheria albicans	0	0	1	0	0	0	0	0	0	0	0	1	1
Waltheria americana	1	5	1	4	0	0	0	0	0	3	2	14	16
Waltheria brachypetala	0	3	0	0	0	0	0	0	0	0	0	3	3
Waltheria bracteosa	0	0	0	0	0	0	0	0	0	1	0	1	1

Waltheria ferruginea	0	9	0	0	0	0	0	0	0	0	0	9	9
Waltheria maritima	0	0	0	1	0	0	0	0	0	0	0	1	1
Waltheria martiana	4	0	1	0	0	0	0	0	0	0	0	5	5
Waltheria rotundifolia	2	0	2	0	0	0	0	0	0	0	0	4	4
Wedelia alagoensis	0	2	0	0	0	0	0	0	0	0	1	2	3
Wedelia hookeriana	0	1	0	0	0	0	0	0	0	0	0	1	1
Wedelia villosa	0	4	1	0	0	0	0	0	0	0	0	5	5
Wissadula amplissima	1	0	1	0	0	0	0	0	0	0	0	2	2
Wissadula contracta	2	1	1	0	2	0	0	0	0	0	0	6	6
Wolffia brasiliensis	0	0	0	0	0	0	0	0	0	0	5	0	5
Wolffiella welwitschii	0	0	0	0	0	0	0	0	0	0	5	0	5
Ximenia americana	2	5	3	0	1	0	2	1	3	4	0	21	21
Ximenia coriacea	1	0	0	0	0	0	0	0	0	0	0	1	1
Xylopia aromatica	0	0	0	0	0	0	0	1	0	0	0	1	1
Xylopia laevigata	0	0	1	0	0	0	0	0	0	0	0	1	1
Xylopia sericea	0	0	1	0	0	0	0	0	0	0	0	1	1
Xylosma ciliatifolia	0	4	0	0	0	0	0	0	0	0	0	4	4
Xyris jupicai	0	0	0	1	0	0	0	0	0	0	0	1	1
Zanthoxylum fagara	0	0	0	0	0	0	0	0	1	0	0	1	1
Zanthoxylum hamadryadicum	0	1	3	0	0	0	0	0	0	0	0	4	4
Zanthoxylum huberi	0	0	0	0	0	0	0	0	1	0	0	1	1
Zanthoxylum petiolare	0	0	0	0	1	0	0	0	0	0	0	1	1
Zanthoxylum rhoifolium	1	1	0	3	1	0	0	0	0	0	0	6	6
Zanthoxylum riedelianum	0	0	0	0	0	3	0	0	0	0	0	3	3
Zanthoxylum stelligerum	0	9	2	0	0	0	0	0	0	0	0	11	11
Zephyranthes cearensis	0	0	0	1	0	0	0	0	0	0	0	1	1

Zephyranthes sylvatica	0	1	0	0	0	0	0	0	0	0	0	1	1
Zeyheria tuberculosa	0	0	0	0	0	4	0	0	0	0	0	4	4
Ziziphus cotinifolia	2	1	2	0	0	0	1	0	2	0	0	8	8
Ziziphus joazeiro	10	3	2	4	4	1	0	1	10	8	0	43	43
Zomicarpa riedelianum	0	0	0	0	1	0	0	0	0	0	0	1	1
Zornia brasiliensis	0	0	1	0	0	0	0	0	0	1	0	2	2
Zornia curvata	0	0	0	1	0	0	0	0	0	0	0	1	1
Zornia diphylla	0	1	0	1	0	0	0	0	0	0	0	2	2
Zornia gardneriana	0	0	1	0	0	0	0	0	0	0	0	1	1
Zornia gemella	0	0	1	0	0	0	0	0	0	0	0	1	1
Zornia glabra	1	0	0	0	0	0	0	0	0	0	0	1	1
Zornia myriadena	0	0	0	2	0	0	0	0	0	0	0	2	2
Zornia reticulata	1	0	0	0	0	0	0	0	0	0	0	1	1
Zornia sericea	0	4	1	1	0	0	0	0	0	0	0	6	6

Appendix 6- Number of unidentified records in each genus reported in floristic or phytosociological papers in the Caatinga Phytogeographical Domain

Genus	Number of unidentified records	Genus	Number of unidentified records
Abutilon	3	Machaerium	6
Acacia	7	Macroptilium	1
Acalypha	3	Malachra	1
Acisanthera	1	Malva	1
Actinostemon	3	Mandevilla	3
Adenocalymma	4	Manihot	14
Aegiphila	2	Manilkara	1
Aeschynomene	5	Mansoa	2
Ageratum	1	Maprounea	3
Albizia	6	Maranta	2
Alibertia	8	Marsdenia	3
Allophylus	2	Marsilea	1
Alstroemeria	1	Mascagnia	1
Alternanthera	6	Matelea	1
Amaranthus	1	Maytenus	9
Anadenanthera	1	Melampodium	1
Andira	3	Melocactus	1
Andropogon	1	Memora	1
Anemia	1	Meriania	1
Anemopaegma	4	Merremia	1
Angelonia	5	Microstachys	1
Aniseia	2	Microtea	3
Annona	6	Mimosa	30
Anthurium	2	Mitracarpus	6
Argythamnia	2	Mouriri	1
Aristida	2	Myrcia	8
Aristolochia	3	Myrciaria	3
Arrabidaea	10	Nemastylis	1
Aspidosperma	4	Ocimum	1
Aspilia	1	Ocotea	1
Axonopus	1	Oncidium	1
Ayenia	1	Opuntia	1
Banara	2	Oryctanthus	1
Banisteriopsis	10	Ouratea	2
Bauhinia	6	Oxalis	5
Begonia	2	Oxandra	1

Bidens	2
Bignonia	3
Blainvillea	1
Bombax	1
Borreria	5
Brassica	2
Bromelia	3
Bulbostylis	1
Byrsonima	5
Caesalpinia	3
Calathea	1
Calliandra	4
Callisia	3
Callisthene	1
Campomanesia	6
Capparis	1
Capsicum	2
Cardiospermum	2
Carica	1
Casearia	4
Cassia	2
Cassytha	1
Cayaponia	3
Celtis	5
Centratherum	1
Cestrum	2
Chamaecrista	5
Chamaesyce	1
Cheilanthes	1
Chloroleucon	1
Chomelia	2
Chorisia	1
Chrysophyllum	4
Cipura	1
Cissampelos	5
Cissus	3
Cleome	3
Clusia	2
Cnidoscolus	4
Coccoloba	5
Cochlospermum	1
Colicodendron	1
Combretum	5
Paepalanthus	1
Panicum	7
Paspalum	4
Passiflora	1
Pavonia	4
Peltogyne	1
Peperomia	1
Pereskia	4
Petalostelma	2
Pfaffia	1
Phaseolus	1
Philodendron	1
Phoradendron	6
Phthirusa	1
Phyllanthus	5
Physaloides	1
Pilosocereus	3
Piper	2
Piptadenia	1
Piriqueta	8
Pisonia	8
Pithecellobium	3
Pleurothallis	1
Plinia	2
Polygala	2
Portulaca	8
Pouteria	3
Pseudechinolaena	1
Pseuderanthemum	2
Pseudobombax	3
Pseudomalachra	3
Psidium	6
Pterandra	1
Ptilochaeta	1
Pyrostegia	1
Rechsteineria	2
Rhamnidium	2
Rhipsalis	2
Rhynchospora	1
Riccia	2
Richardia	1
Rudgea	1
Ruellia	5

Commelina	6	Samolus	2
Copaifera	2	Sapium	12
Corchorus	2	Schinus	1
Cordia	15	Schoepfia	2
Crotalaria	2	Schubertia	2
Croton	49	Schwenckia	1
Cucumis	2	Scoparia	1
Cupania	1	Sebastiania	4
Cuphea	9	Securidaca	3
Cuspidaria	8	Selaginella	1
Cyperus	11	Senna	7
Cyrtopodium	3	Serjania	6
Dalbergia	1	Sesbania	1
Dalechampia	4	Setaria	2
Declieuxia	1	Sida	14
Desmodium	5	Smilax	2
Dichorisandra	2	Solanum	20
Digitaria	5	Sparattanthelium	1
Dioclea	3	Spermacoce	1
Diodia	3	Spigelia	2
Dioscorea	7	Spondias	1
Diospyros	1	Stachytarpheta	2
Ditassa	1	Stigmaphyllon	2
Dorstenia	1	Stilpnopappus	2
Dyschoriste	1	Struthanthus	4
Ebertia	1	Stylosanthes	1
Eclipta	1	Syngonanthus	1
Eleocharis	3	Tabebuia	7
Elytraria	1	Talinum	3
Emilia	1	Tecoma	1
Encholirium	1	Terminalia	2
Encyclia	1	Tetrastylis	2
Eriope	2	Tetraulacium	1
Eriotheca	1	Tibouchina	3
Erythroxylum	12	Tillandsia	2
Esenbeckia	1	Tournefortia	4
Eucalyptus	1	Tradescantia	1
Eugenia	30	Tragia	2
Eupatoriopsis	1	Trichilia	2
Eupatorium	2	Trichogonia	1
Euphorbia	1	Trimezia	1
Evolvulus	7	Triplaris	1
Fagara	2	Triumfetta	2

Faramea	1	Turnera	4
Ficus	3	Urvillea	1
Fimbristylis	2	Vallisneria	1
Froelichia	1	Vanilla	1
Gomphrena	6	Vernonia	5
Gouania	1	Vitex	4
Guapira	8	Vriesea	1
Guazuma	1	Waltheria	4
Guettarda	1	Wedelia	1
Gymnanthes	5	Wilbrandia	5
Habenaria	1	Wissadula	1
Heisteria	2	Xylosma	2
Helicteres	4	Zanthoxylum	1
Heliotropium	2	Zephyranthes	1
Herbertia	1	Undetermined Amaranthaceae	1
Herissantia	2	Undetermined Anacardiaceae	2
Heteropterys	6	Undetermined Apocynaceae	4
Hippeastrum	5	Undetermined Asteraceae	9
Hippocratea	1	Undetermined Bignoniaceae	9
Hybanthus	1	Undetermined Bigoniaceae	1
Hydrolea	1	Undetermined Convolvulaceae	1
Hymenaea	1	Undetermined Cucurbitaceae	3
Hyptis	3	Undetermined Cyperaceae	3
Ichnanthus	1	Undetermined Erythroxylaceae	1
Indigofera	2	Undetermined Euphorbiaceae	3
Ipomoea	17	Undetermined Fabaceae	18
Jacquemontia	8	Undetermined Flacourtiaceae	1
Jatropha	7	Undetermined Lamiaceae	3
Justicia	1	Undetermined Liliaceae	1
Kyllinga	1	Undetermined Lythraceae	4
Lantana	5	Undetermined Malpigiaceae	8
Laportea	1	Undetermined Malvaceae	2
Lasiacis	1	Undetermined Myrtaceae	14
Leandra	1	Undetermined Poaceae	3

Lemna	1	Undetermined Polygonaceae	2
Licania	1	Undetermined Rubiaceae	8
Lippia	9	Undetermined Sapotaceae	1
Lonchocarpus	3	Undetermined Solanaceae	1
Lophothecium	1	Undetermined Turneraceae	1
Ludwigia	3	Undetermined Ulmaceae	1
Luehea	1	Undetermined Urticaceae	2
Luetzelburgia	2	Undetermined Verbenaceae	2
Macfadyena	1	Records not assigned to any family	56
Total number of unidentified records		1138	

Appendix 7- Number of unidentified records in each family reported in floristic or phytosociological papers in the Caatinga Phytogeographical Domain.

Family	Number of unidentified records	Family	Number of unidentified records
Acanthaceae	11	Malpighiaceae	34
Alstroemeriaceae	1	Malvaceae	52
Amaranthaceae	16	Marantaceae	3
Amaryllidaceae	7	Marsileaceae	1
Anacardiaceae	4	Melastomataceae	7
Anemiaceae	1	Meliaceae	2
Annonaceae	7	Menispermaceae	5
Apocynaceae	20	Moraceae	4
Araceae	4	Myrtaceae	70
Aristolochiaceae	3	Nyctaginaceae	16
Asparagaceae	1	Ochnaceae	2
Asteraceae	30	Olacaceae	2
Begoniaceae	2	Onagraceae	3
Bignoniaceae	52	Orchidaceae	8
Bixaceae	1	Oxalidaceae	5
Boraginaceae	21	Passifloraceae	3
Brassicaceae	2	Phyllanthaceae	5
Bromeliaceae	7	Phytolaccaceae	3
Cactaceae	11	Piperaceae	3
Cannabaceae	5	Plantaginaceae	7
Capparaceae	5	Poaceae	28
Caricaceae	1	Polygalaceae	5
Celastraceae	10	Polygonaceae	8
Chrysobalanaceae	1	Portulacaceae	11
Clusiaceae	2	Pteridaceae	1
Combretaceae	7	Rhamnaceae	3
Commelinaceae	12	Ricciaceae	2
Convolvulaceae	36	Rubiaceae	38
Cucurbitaceae	13	Rutaceae	4
Cyperaceae	22	Salicaceae	9
Dioscoreaceae	7	Santalaceae	6
Ebenaceae	1	Sapindaceae	12
Eriocaulaceae	2	Sapotaceae	9
Erythroxylaceae	13	Schoepfiaceae	2
Euphorbiaceae	118	Selaginellaceae	1

Fabaceae	134	Smilacaceae	2
Gesneriaceae	2	Solanaceae	27
Hernandiaceae	1	Theophrastaceae	2
Hydrocharitaceae	1	Turneraceae	13
Hydroleaceae	1	Ulmaceae	1
Iridaceae	4	Urticaceae	3
Lamiaceae	15	Verbenaceae	18
Lauraceae	2	Violaceae	1
Loganiaceae	2	Vitaceae	3
Loranthaceae	6	Vochysiaceae	1
Lythraceae	13	Records not assigned to any family	56
Total number of unidentified records		1138	

CAPÍTULO 3- Plant communities in the Caatinga Phytogeographical Domain: the influence of ecosystem type, climate and spatial autocorrelation

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ABSTRACT: The Caatinga Phytogeographic Domain (CPD) is one of the largest semiarid regions of South America. Biogeographical studies have suggested that at least two floristic groups exist in the CPD: one in terrains of crystalline origin and other in sedimentary terrains. But the CPD is very heterogeneous and it is to be expected that a larger number of different plant communities inhabit its various ecosystems. Here we present a biogeographical synthesis of the floristic data available for the CPD. We compiled published floristic/phytosociological surveys and compared the floristic similarity of these sites using multivariate analyzes to understand how each environment type relates floristically to the others. We also used variation partitioning analysis to check how climate, environment type and spatial autocorrelation influence these communities. We found that not only are crystalline and sedimentary caatingas clearly distinct, but also that inselbergs collectively formed a third floristic group. Other ecosystem types occurring within the CPD were generally related to the flora of crystalline caatinga. Although the total explained variation was generally low in our models, the environment type was the most important variable to explain the observed variation in plant community composition.

KEY-WORDS: Biogeography; Seasonally Dry Tropical Forests; Semi-arid vegetation; Biomes; Brazil.

Introduction

Differences in environment type (soil type, geology, etc) and rainfall regime are recognized as important factors responsible for structuring plant communities (Buck 1964;

Balvanera et al. 2011; Neri et al. 2012). And within a large and heterogeneous ecoregion one could expect to have different plant communities associated with different geological terrains, environment types and rainfall gradients. Among the many ecoregions of the American continent (Olson et al. 2001) there is a group of vegetation types, collectively termed Seasonally Dry Tropical Formations (SDTFs), which are exposed annually to a long dry season lasting 5-6 months. These areas vary physiognomically but share similar ecological constrains and some disjunct taxa that tolerate a prolonged shortage of rainfall every year (Sarmiento 1975; Prado 2000; Pennington et al. 2000). The largest area of SDTF in South America is known as the Caatinga Phytogeographical Domain (CPD) and is located in Northeastern Brazil. The CPD is more than 800,000 km^2 in area (Pennington et al. 2000; Velloso et al. 2002; IBGE [Instituto Brasileiro de Geografia e Estatística] 2004) and, as one would expect, harbors different ecosystems, and different plant communities (Velloso et al. 2002; Santos et al. 2012; Chapters 2 and 4 of this thesis) as explained below.

The most widespread ecosystem type within this domain (called caatinga *sensu stricto*) occurs in the widespread peneplains of northeastern Brazil, in areas over the crystalline bedrock (Fig. 1) (these communities are hereafter called crystalline caatinga). These areas usually have shallow, nutrient rich soils (Sampaio 1995; Velloso et al. 2002).

Besides the crystalline caatinga, another large ecosystem type occupies the large sedimentary basins and dune systems where terrains of sedimentary origin are available for plant communities to colonize (Fig. 1). These sedimentary areas have different edaphic conditions when compared to crystalline terrains: the soils are much deeper and poorer in nutrients (Velloso et al. 2002; Sampaio 2010).

The CPD has also some large ecotonal areas with the Cerrado Domain (mostly composed by savannas) to the west and the Atlantic Forest Domain (mostly wet forests) to the east (Fig. 1) (Ab'Sáber 2003). Heading eastward, one finds progressively increased rainfall amounts and thus enters the ecotone of the CPD with the Atlantic Forest in a region known as "a*greste*". To the west the CPD has an ecotone with the cerrado savannas, in a region known as *Campo Maior*. To the south the CPD shows a second ecotone with the Cerrado domain, in areas with larger rainfall and less seasonal regimes, resulting in a subtype of caatinga called Arboreal Caatinga (Ab'Sáber 1974; Velloso et al. 2002; IBGE [Instituto Brasileiro de Geografia e Estatística] 2004; Santos et al. 2012). Besides these transitional environments, in the very heart of the CPD there is a highland range called *Chapada Diamantina* mountains, where caatinga, cerrado and campos rupestres (rocky grasslands) vegetation mix (Juncá et al. 2005) (Fig. 1). Apart from these major, extensive environment types other, fine scaled ecosystem types also occur within the CPD. These include plant communities in inselbergs and riverine forests, completing the picture of terrestrial ecosystems for the CPD.

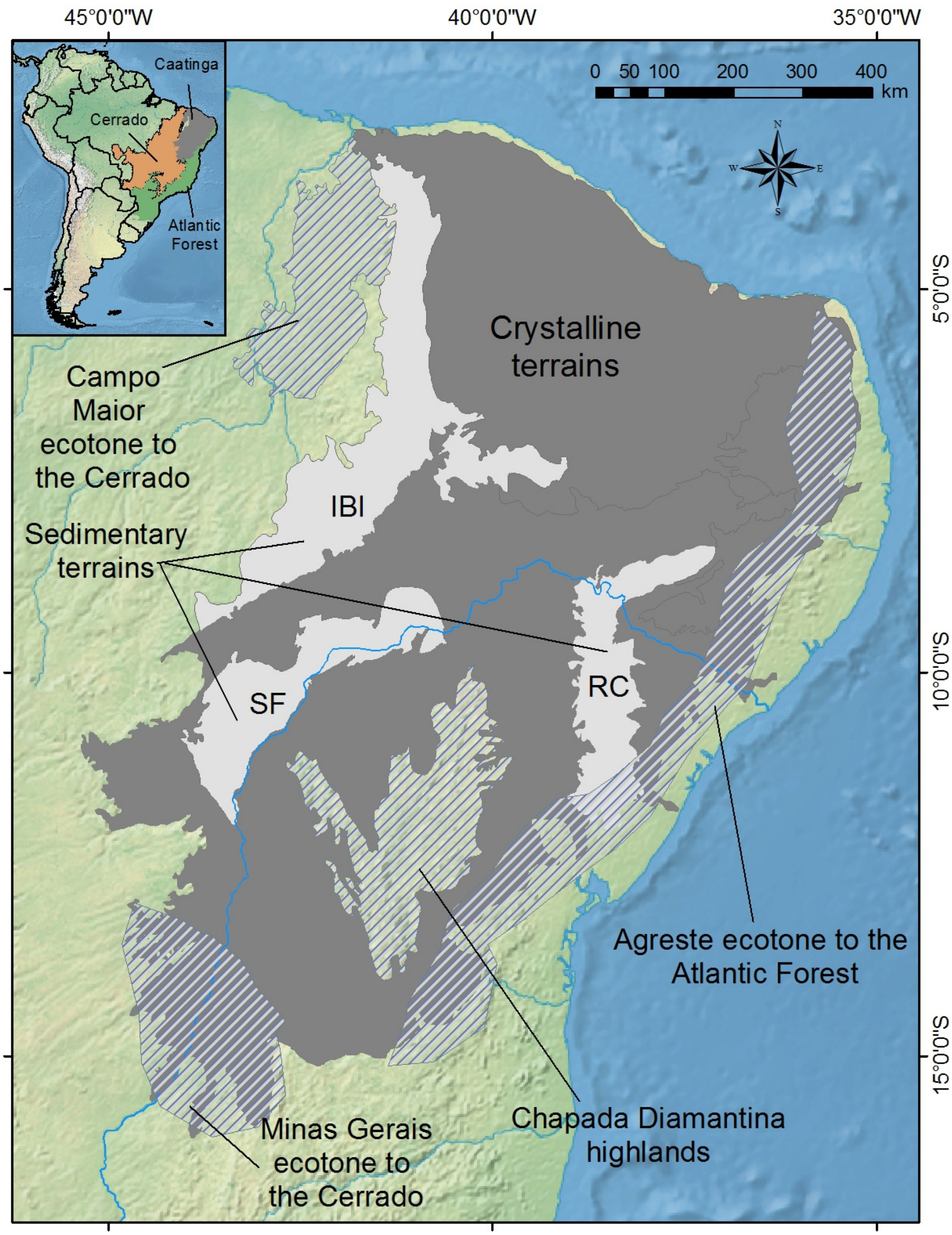

Fig. 1- Geographical location of the Caatinga Phytogeographical Domain and its main environment types: Crystalline terrains, Sedimentary terrains (IBI: Ibiapaba-Araripe sedimentary basin; RC: Raso da Catarina sedimentary basin; SF: São Francisco continental dunes), and ecotonal regions (Map of Caatinga modified from Velloso et al. 2002). The ecotonal areas shown in the map are only an illustrative approximation made by the authors. Map elaboration: M.F. Moro.

Being a very heterogeneous domain (Andrade-Lima 1981; Ab'Sáber 2003), the CPD is expected to harbor different plant communities for some of its environments. In fact, the idea that the flora occupying sedimentary terrains was different from the crystalline caatinga is not new, being a theme for floristic surveys since at least the 1990's (Araújo and Martins 1999; Araújo et al. 1999). But at that time the CPD was very poorly sampled and limited data were available for comparison (see the Chapter 1 of this thesis). In the last ten years, taking advantage of the growing number of floristic surveys available in the literature other studies were made, comparing the composition of communities in different environment types within the CPD (Araújo et al. 1999; Queiroz 2006; Gomes et al. 2006; Cardoso and Queiroz 2007; Santos et al. 2012).

These studies are now broadening our understanding of how plant communities occupying this large semiarid ecoregion of South America relate floristically to one another, but each of the previous studies made have their own important limitations. Some studies had a much smaller dataset available for analysis at its time (Gomes et al. 2006) or compared only plant composition for a specific family (Queiroz 2006; Cardoso and Queiroz 2007), or did not consider the biogeographical influence of climate, environment type and spatial autocorrelation on the data (Queiroz 2006; Gomes et al. 2006; Cardoso and Queiroz 2007). A very recent paper (Santos et al. 2012) has taken a step forward, testing formally how environment, climate and community type interact, but this study was restricted to woody plants, ignoring the non woody component, which we have shown (Chapters 2 and 4 of this thesis) to be a large proportion of plant diversity in the CPD.

We take advantage of the recent availability of a growing number of floristic surveys in the CPD, many of which sampled both the woody and the non woody component of the vegetation, to make the largest possible biogeographical synthesis for Caatinga plants. Our aim was to understand the floristic affinities between different environment types within the CFD taking into account the relative influence of climate, environment type and spatial autocorrelation on the data. We aim to show how different environment types within the CPD relate to one another and to determine how much climate, space and environment type determine the composition of species in this large semiarid ecoregion of the world.

Material & Methods

Database compilation

To assess the relative influence of environment type, climate and spatial autocorrelation in structuring plant communities and to understand the floristic relationships between the many ecosystem types within the CPD we gathered floristic or phytosociological papers surveyed within the borders of the CPD as defined by Velloso et al. (2002). We considered all studies on terrestrial ecosystems inside the CPD excluding only studies on enclaves of wet forest, cerrado savannas and rocky grasslands (campos rupestres) within the CPD, because these vegetation types are floristically related to surrounding biomes, not to Caatinga itself (see also Chapter 1). We then classified each compiled survey in one of the ecosystem types defined in the Chapter 2. The environment categories were:

Crystalline caatinga: typical caatinga *sensu stricto* of the crystalline peneplains that occupy most of the area of the CPD, being CPD's most widespread environment type (see Fig. 1).

Sedimentary caatinga: A type of vegetation occurring mainly on sedimentary basins and continental dune systems within Caatinga. Some small patches of sedimentary terrains also occur within mainly crystalline landscapes.

Transition crystalline/sedimentary: sites located in transitional areas between crystalline and sedimentary landscapes.

Inselbergs: scattered within the CFD there are many sites where extremely shallow soils occur and the rocky basement is apparent. These areas represent the inselberg environment.

Caatinga in Agreste: the transitional areas between the CFD and the Atlantic Forest Domain are known as *agreste*. Although under semiarid climate, the Agreste is less seasonal and usually has more rainfall than the typical CFD, mixing floristic elements of the CFD and the Atlantic forest.

Arboreal caatinga: In the southernmost part of the CFD, where a transition to the Cerrado savannas occurs (northern Minas Gerais state) there is a taller subtype of caatinga know as "arboreal caatinga". These represent areas with larger rainfall than more central sites of Caatinga.

Caatinga in the Chapada Diamantina: In the very center of the CFD (see Fig. 1) exists a range of highlands called Chapada Diamantina. In these areas rocky grasslands (campos rupestres), cerrado savannas and caatinga vegetation mix. We selected for our biogeographical analysis only surveys in the caatinga vegetation of Chapada Diamantina.

Caatinga in Campo Maior: Campo Maior region represents a transition between the CPD and the cerrado areas of Piauí state. While agreste represent the easternmost ecotonal areas (to the Atlantic Forest) and arboreal caatinga represents the southernmost ecotone (to the Cerrado), Campo Maior represents the westernmost ecotone of the CFD.

Riverine Forests: within the CFD there are riverine forests following the riverbeds, where soils are deeper and edaphic water supply larger.

Some of the published papers in our compilation presented only a very poor description of the studied sites or reported data on degraded areas (studies on agricultural landscapes). We excluded these studies from our dataset (but these areas are reported as "*unclassified caatinga*" in Chapter 2). We also excluded from our dataset all papers that reported fewer than 20 species, because these represented studies with very small sampling effort. The other studies listed in the Chapter 2 were used in the following analyses.

Environmental and spatial data

All selected areas were inserted in a georeferenced database with geographical location, environment type and the species reported in each survey. We then updated the botanical nomenclature following the Lista de species da Flora do Brasil (Forzza et al. 2010, 2011) to resolve synonyms (see Chapter 2). We then obtained the climatic variables for each site using the WorldClim model (Hijmans et al. 2005) using ArcGis software. The WorldClim model provides a set of 19 bioclimatic variables (BioClim) that are readily available for biogeographical comparisons. To understand the influence of space on the plant communities we used the geographical position of each site (Fig. 2) and computed a geographic distance matrix between all pairs of sites.

Comparing the floristisc similarity among different plant communities

To compare the floristic similarity between plant communities in each site, we created a presence/absence matrix (incidence table), classified each site in one of the "environment types" and used group and ordination techniques to evaluate if there is a clear pattern of species composition related to the environment types within Caatinga. We then searched the botanical literature and consulted specialists to classify each plant species as "woody" or "non woody". Trees, treelets, shrubs and lianas (woody climbers) were classified in the "woody elements". Subshrubs, herbs and herbaceous climbers were classified in the "non woody elements". Epiphytes and hemiparasites were excluded from the matrices. We then created UPGMA dendrograms using Sorensen distance and ordinated all sites using Nonmetric Multidimensional Scaling (NMS) (McCune and Grace 2002; Legendre and Legendre 2012). These analyses were made using four subsets of data:

1) All study sites together, irrespective whether these sites have data on general flora (woody plus non woody plants), woody flora only, or non woody flora only;
2) Only sites with data on *general flora* (surveys which compiled data on both woody and non woody plants for the same site);
3) Only *woody* species, as reported in any of the compiled studies, and;
4) Only *non woody* species, as reported in any of the compiled studies.

Relative influence of environment type, climate and spatial autocorrelation in structuring plant communities

The group and ordination methods aimed at revealing floristic groups within Caatinga. To determine how much environment type, climate and spatial autocorrelation influence the floristic composition between sites we used a variation partitioning analysis (Legendre and Legendre 2012), using the floristic composition as the response variable and three sets of explanatory variables: 1) environment type as a categorical variable; 2) climatic variables provided by WorldClim model; 3) geographic distances among sites. We then built a model to determine how much of the variation found in the floristic composition was explained by each independent variable and how much was left as unexplained variation in the residuals.

Turnover of woody and non woody species in Caatinga

In order to complement our understanding about how climate and geographic distances influenced the plant communities in the CPD we split the studies dealing with general flora into their woody and non woody components. We then computed how the species turnover occurred in relationship with geographical distances and environmental distances (in the form of climatic variables).

Results

Database compilation

Excluding the surveys which we could not assign to any ecosystem type, studies in agricultural landscapes and small sample studies (i.e. less than 20 species reported), we retained 74 surveys in our database (Fig. 2). Of these, 31 sampled the general flora of the study site (both woody and non woody plants reported in the study), 39 sampled only woody plants and five sample only non woody plants (Table 1). The sedimentary caatinga environment had the largest number of surveys in our dataset, with 18 sites, followed by the crystalline caatinga (12 sites), inselberg communities (10), arboreal caatinga (9), riverine forest (8), caatinga in the agreste ecotone (6), the transition between crystalline and sedimentary sites (6), the caatinga in the Chapada Diamantina highlands (3) and the caatinga in the campo maior ecotone (2) (Table 1; Fig. 2).

Table 1 – number of selected surveys with environment type and sampled component

Environment type	General flora (woody + non woody)	Woody only	Non woody only	Total
Sedimentary Caatinga	11	7	0	18
Crystalline Caatinga	4	6	2	12
Inselberg	10	0	0	10
Arboreal Caatinga	0	9	0	9
Riverine forest	1	7	0	8
Caatinga in Agreste (Ecotone to the Atlantic Forest)	2	3	1	6
Transition crystalline/sedimentary	3	2	1	6
Caatinga in the Chapada Diamantina	0	3	0	3
Caatinga in Campo Maior (Ecotone to the Cerrado)	0	2	0	2
Total	31	39	4	74

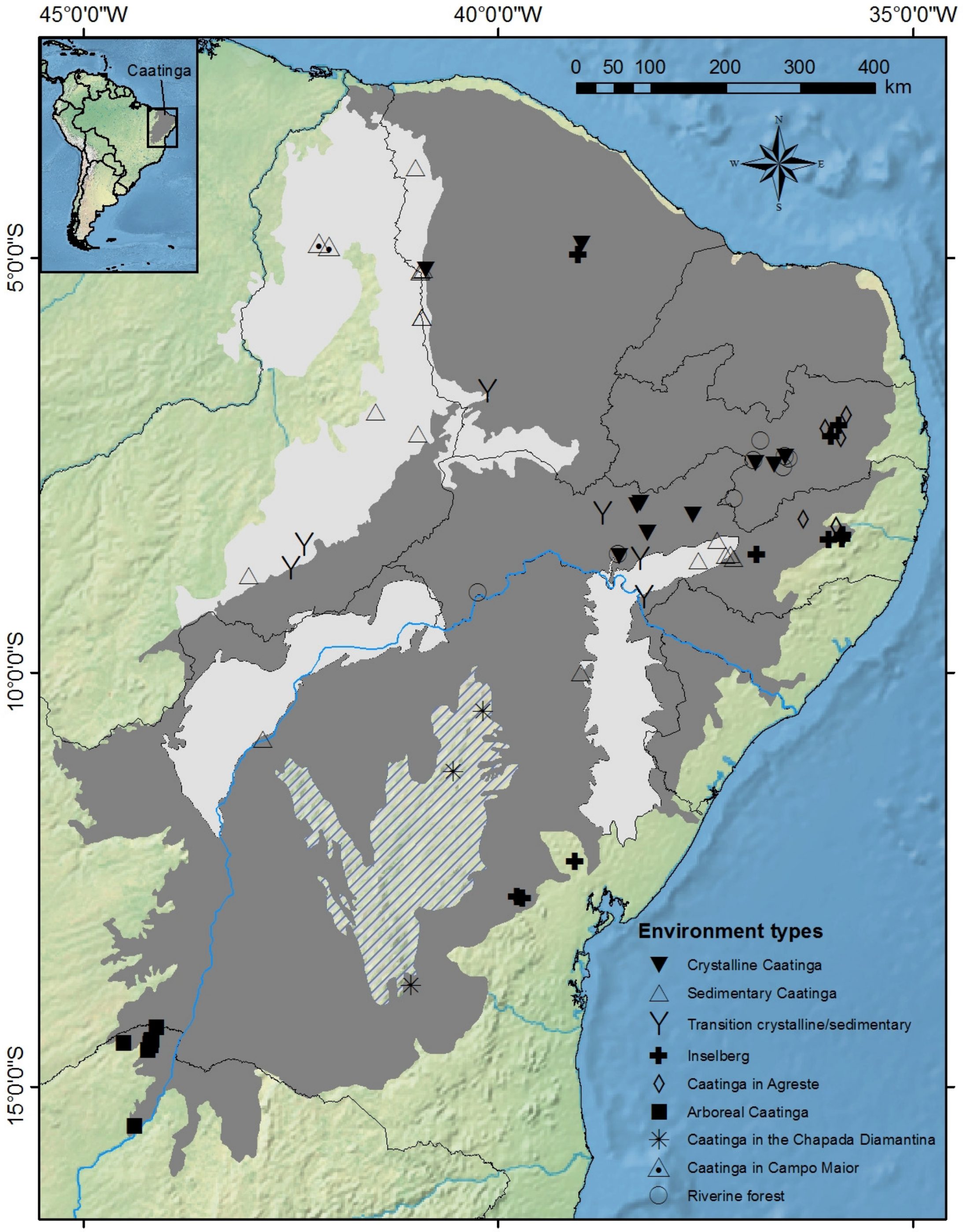

Fig. 2- geographical position of the 75 surveys compiled within the Caatinga Phytogeographical Domain, NE Brazil, and the environment type of each study (Map elaboration: M.F. Moro).

Comparing the floristic similarity among different plant communities

Looking at the group and ordination analysis we see that there is a clear floristic differentiation among the main environment types within Caatinga. All sedimentary caatingas and Campo Maior (also a sedimentary landscape) sites grouped together and formed a separate group from crystalline caatinga sites (Fig. 3; Fig. 4). Sedimentary caatingas and the caatinga of Campo Maior were a quite homogeneous group when analyzing both general flora and woody plants (Fig. 3; Fig. 4; Fig. S1; Fig. S2), although when evaluating the non woody component, sedimentary sites formed two groups (Fig. 4-C; Fig. S3). As a whole, the sedimentary caatinga environment, though dispersed in far separated areas (Fig. 1; Fig. 2), had the more congruent plant community, sharing a clear floristic affinity between all sites.

Crystalline caatinga, the most widespread environment type, had a more heterogeneous flora forming at least two subgroups in our analyses, both of which were congruent and clearly separate from the sedimentary caatinga (Fig. 3; Fig. 4; Fig. 5). Minor environments embedded within the crystalline terrains (i.e. Riverine forests and agreste) were represented as a floristic subtype of crystalline caatinga (Fig. 3; Fig. 4; Fig. 5). Unfortunately, no floristic study on the crystalline caatingas of the vast areas of Bahia state is available, but it seems that the caatingas of Chapada Diamantina and arboreal caatingas of northern Minas Gerais state represent a floristic gradient among the typical crystalline caatinga sites. These areas grouped within the crystalline caatinga in the UPGMA analysis, but had a peripheral position on the two dimensional NSM (Fig. 3; Fig. 4; Fig. 5), where the arboreal caatinga of northern Minas Gerais had a clearly distinct flora.The sites in the Chapada Diamantina were located midway from the northernmost crystalline caatinga sites and the southernmost arboreal caatingas sites and, accordingly, had a flora intermediate between the northernmost crystalline caatinga and the southernmost arboreal caatinga.

Inselberg sites had a clear cohesive pattern. A few inselbergs had a flora very similar to the crystalline caatinga while the others had a flora that gradually became more and more distinct. This applies to both the general and woody floras (Fig. 4; Fig. 5 A and B; Fig. S1; Fig. S2), but when only non woody plants are evaluated, the flora of inselbergs were represented in the NMS as a subcomponent of the crystalline caatinga (Fig. 5-C). It seems that the non woody component of the inselberg flora is more heterogeneous than the woody component, with non woody plants of inselbergs grouping in different positions in the UPGMA analysis (Fig. S3).

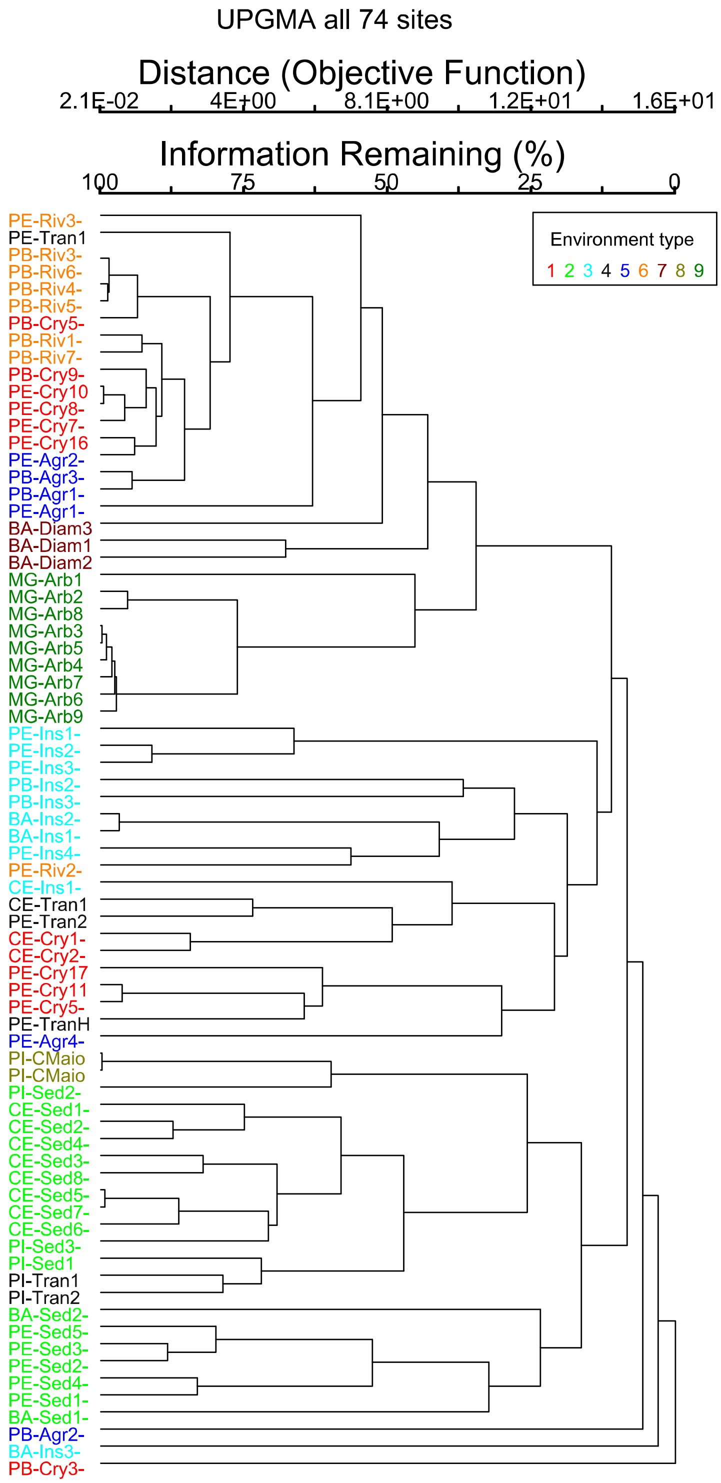

Fig. 3- UPGMA group analysis of the 74 compiled sites in the Caatinga Phytogeographical Domain, showing the relative floristic similarity among sites (Sorensen distance). Environmental types: 1- crystalline caatinga; 2- sedimentary caatinga; 3- inselbegs; 4- transition crystalline and sedimentary sites; 5- Caatinga in the Agreste Ecotone; 6- Riverine forests; 7- Caatinga in the Chapada Diamantina; 8- Caatinga in Campo Maior Ecotone; 9-Arboreal Caatinga of northern Minas Gerais.

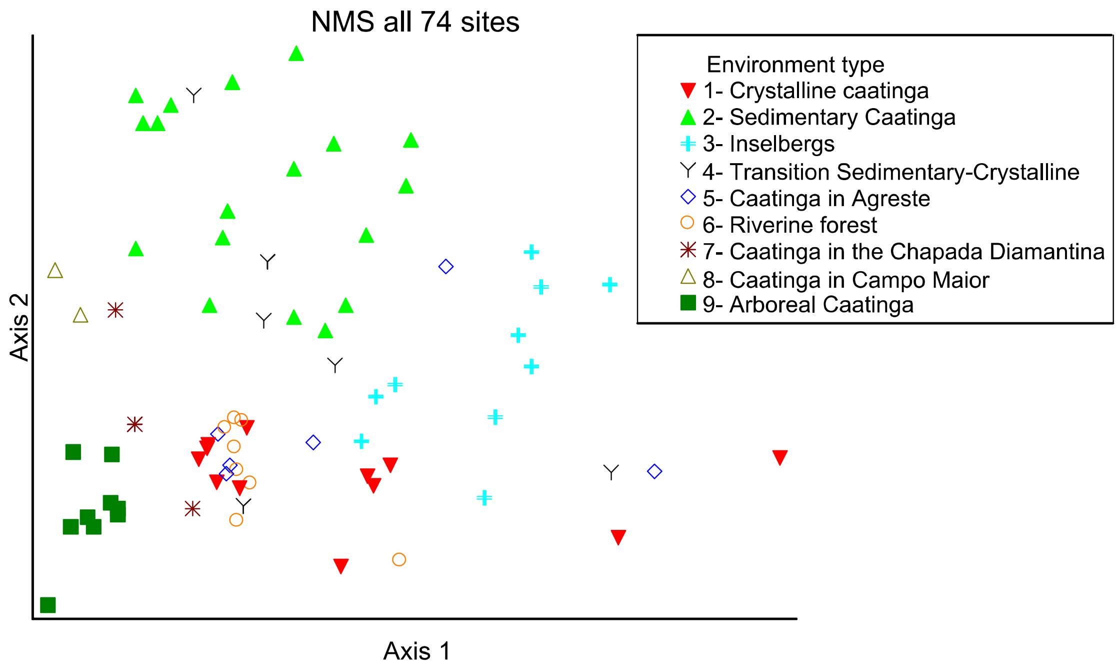

Fig. 4- NMS ordination of the 74 compiled sites in the Caatinga Phytogeographical Domain, showing the relative floristic similarity among sites. Environmental types: 1- crystalline caatinga; 2- sedimentary caatinga; 3- inselbegs; 4- transition crystalline and sedimentary sites; 5- Caatinga in the Agreste Ecotone; 6- Riverine forests; 7- Caatinga in the Chapada Diamantina; 8- Caatinga in Campo Maior Ecotone; 9- Arboreal Caatinga of northern Minas Gerais. NMS calculated with Sorensen distance, 250 runs, final stress for a two dimensional solution: 17.92.

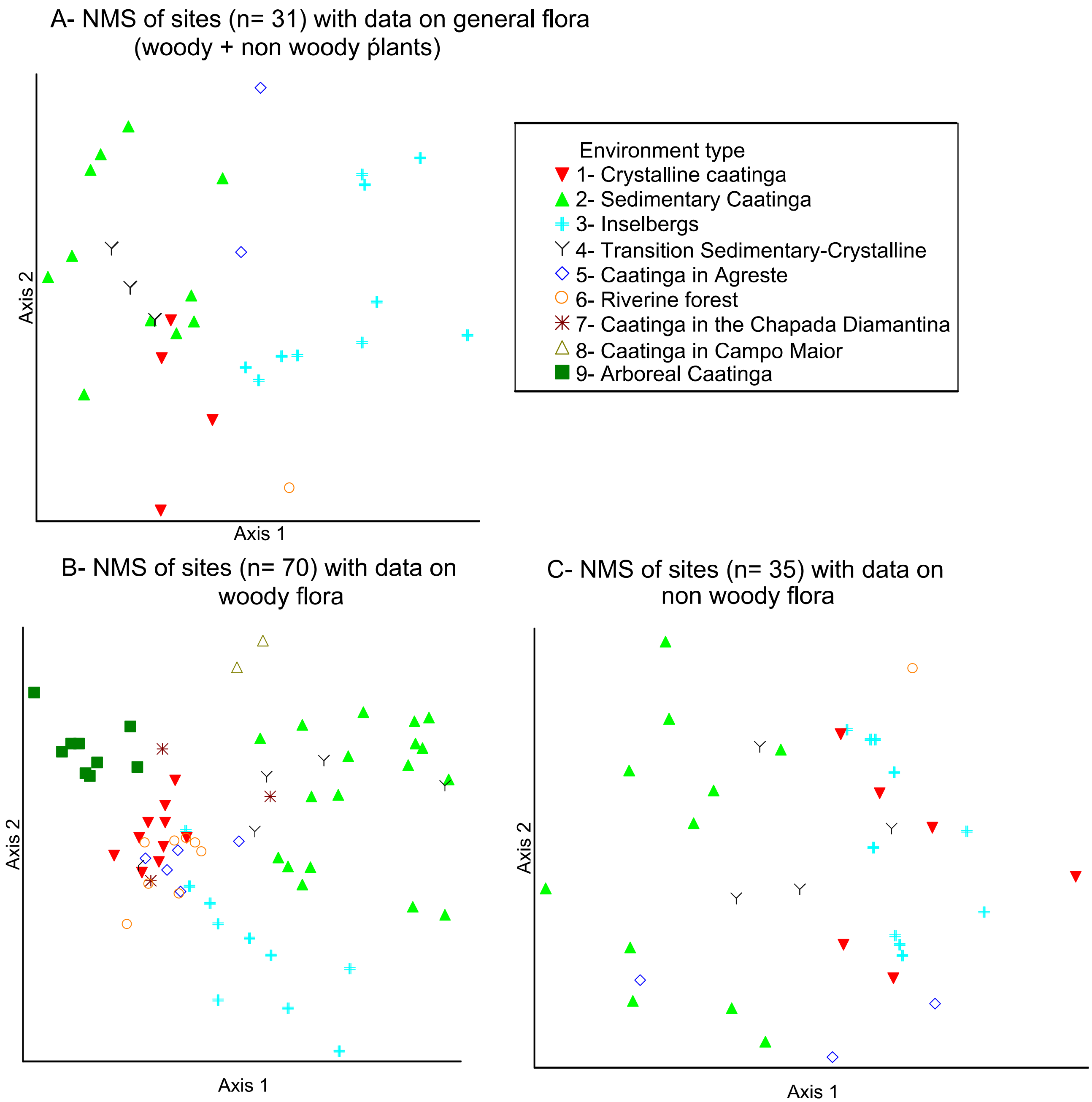

Fig. 5- NMS ordination of the sites, showing the floristic relationships in the Caatinga Phytogeographical Domain for the three subsets of our data (A- only sites where we had data on general flora; B- only sites where we had data on woody plants; C- only sites where we had data on non woody plants). For ordination and group analysis for the complete dataset, see Figures 3 and 4 above). Environmental types: 1- crystalline caatinga; 2- sedimentary caatinga; 3- inselbegs; 4- transition crystalline and sedimentary sites; 5- Caatinga in the Agreste Ecotone; 6- Riverine forests; 7- Caatinga in the Chapada Diamantina; 8- Caatinga in Campo Maior Ecotone; 9- Arboreal Caatinga of northern Minas Gerais. NMS 2d solution calculated with Sorensen distance, 250 runs.

Relative influence of environment type, climate and spatial autocorrelation in structuring plant communities

Our variation partitioning analysis showed that environment type (as a categorical variable), climate (see influence of individual climate variables in Table S2) and spatial autocorrelation (see influence of individual PCNMs in Table S3) had similar influence on the structure of the plant communities, but the type of environment explained more than climate or spatial autocorrelation in most of the subsets analyzed (Table 2). Over 70% of the variation remained in the residuals for almost all subsets, being related to variables not available for inclusion in the models (such as historical human impacts, for example). Only in the partitioning variation analysis for sites with data on woody plants only (the largest dataset available; n= 70) was over 30% of the variation explained by the models (Table 2). In this dataset climate, not environment category was the most important variable to explain the observed variance in (woody) plant composition.

Table 2- Relative influence of climate variables, environment type and spatial autocorrelation on variation partitioning of floristic similarities between sites in the Caatinga Phytogeographical Domain. In bold the explanatory variable which explained most variation for each dataset analyzed.

Explanatory_Variable	Formula	General flora* (n=31)	p	Non-Woody plants for sites with data on general flora (n=31)	p	Woody plants for sites with data on general flora (n=31)	p	All sites with data on Non-Woody plants (N=35)	p	All sites with data on Woody plants Sites (N=70)	p
Climate	X1 ǀ X2+X3	0.08597	0.005	0.06664	0.0167	0.02689	0.12	0.06163	0.005	**0.08391**	0.005
Environment type	X2 ǀ X1+X3	**0.10535**	0.005	**0.08152**	0.005	**0.07882**	0.005	**0.08357**	0.005	0.06575	0.005
Spatial Autocorrelation	X3 ǀ X1+X2	0.07791	0.015	0.05938	0.0225	0.03578	0.099	0.06321	0.01	0.07015	0.005
	X1*X2 ǀ X3	-0.02104	NA	-0.01697	NA	0.00805	NA	-0.01988	NA	0.01695	NA
	X1*X3 ǀ X2	-0.02898	NA	-0.01543	NA	-0.01453	NA	-0.01909	NA	0.01158	NA
	X2*X3 ǀ X1	0.03277	NA	0.04029	NA	0.07196	NA	0.03927	NA	0.03491	NA
	X1*X2*X3	0.03288	NA	0.01786	NA	0.02459	NA	0.02959	NA	0.08178	NA
Residual Variation	Residuals	0.71513	NA	0.76671	NA	0.76843	NA	0.7617	NA	0.63497	NA

* Only those studies with data on both woody and non woody plants for the same site.

Turnover of woody and non woody species in Caatinga

When geographical or environmental distances increase, there is a clear trend towards a turnover of plant species in both woody and non woody components of Caatinga (Fig. 6; Fig. 7; Fig. 8). Nevertheless, this tendency is not equal regarding the woody and non woody component of Caatinga. The turnover for non woody plants was higher when considering both geographical distances and environmental distances (Fig. 6; Fig. 7), showing that beta diversity is higher for non woody plants when compared with the woody component.

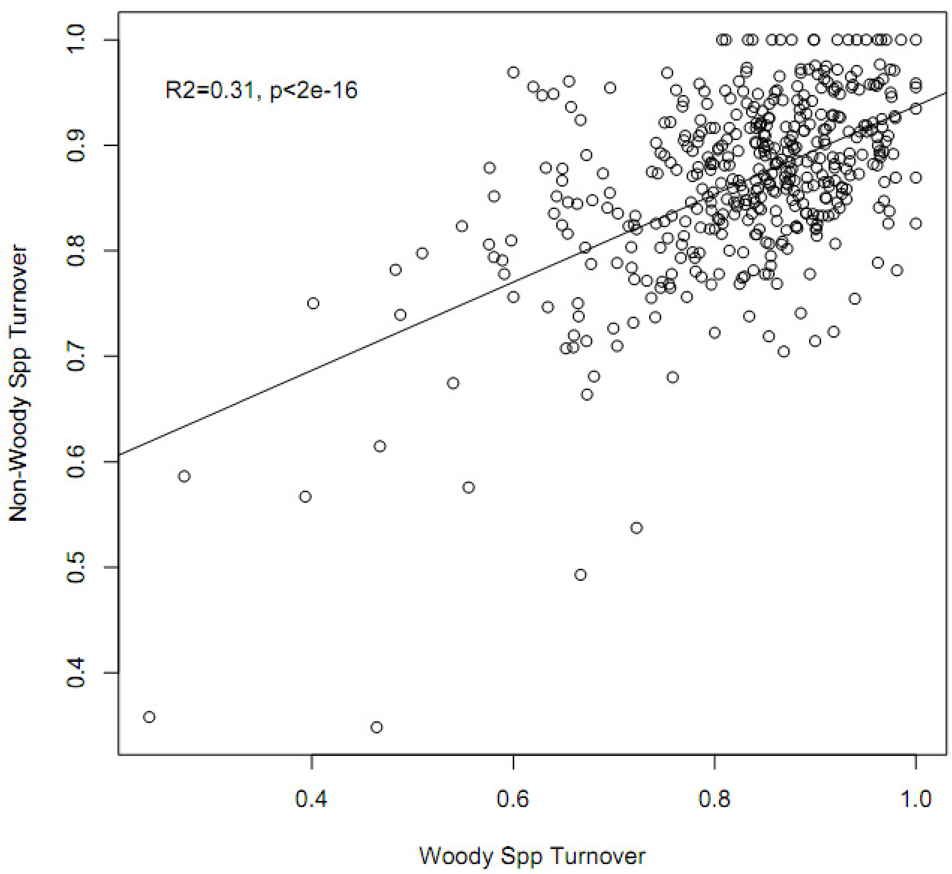

Fig. 6- Woody versus non woody species turnover considering only the 31 sites with data on general flora for the Caatinga Phytogeographical Domain split into their two subcomponents (woody or non woody plants).

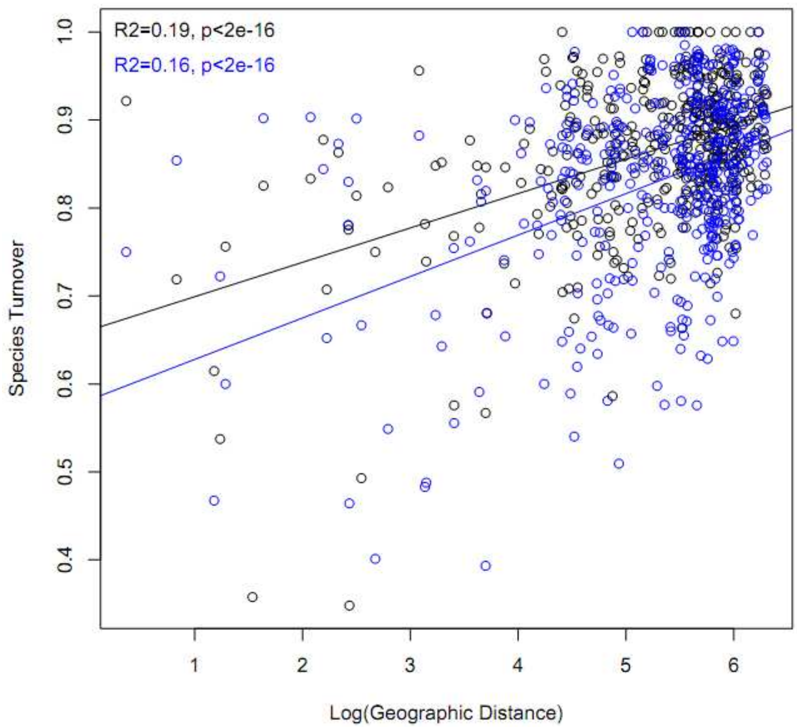

Fig. 7- Differential species turnover for woody (blue dots and line) and non woody (black dots and line) plants in relation to the geographical distances between sites in the Caatinga Phytogeographical Domain, considering only the 31 sites with data on general flora split in their subcomponents (woody or non woody plants) for the analysis.

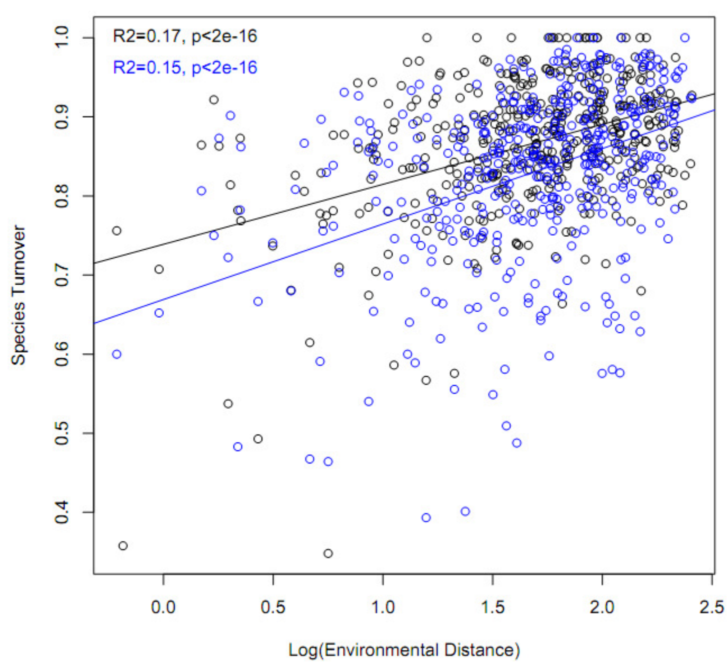

Fig. 8- Differential species turnover for woody (blue dots and line) and non woody (black dots and line) plants in relation to the environmental distances between sites in the Caatinga Phytogeographical Domain, considering only the 31 sites with data on general flora split in their subcomponents (woody or non woody plants) for the analysis.

The regression coefficients (R^2) of the models were not very high (between 15 and 19%), but were highly significant ($p<< 0.001$), which is consistent with the significant, but relatively low influence of space and climate in structuring the plant communities as shown above in the variation partitioning.

Discussion

Data availability

Caatinga was historically one of the least studied phytogeographical domains in Brazil (Santos et al. 2011), but as shown in Chapter 1, the number of floristic and phytosociological studies is increasing each year. Nevertheless there are important biases in the available data. Although the crystalline caatinga is by far the most widespread ecosystem type in the CPD it is not the best studied, and most of the surveys in crystalline caatingas are concerned only with woody plants, ignoring the non woody component (Table 1). As shown in the Chapters 2 and 4, the non woody component is very rich in crystalline caatingas and this component has been overlooked by most studies. Also, when we see the location of studies in crystalline caatingas (Fig. 2), there are large gaps in the sampling coverage. The crystalline caatingas of Bahia, for example, were not represented by any study. Similar imbalances in sampling were seen in other environment types. All riverine forests and inselberg sites were sampled within crystalline landscapes, and most of the inselbergs were surveyed in the *agreste* ecotonal areas, not in typical crystalline caatinga sites. A discussion of the gaps in data availability for each environment is presented in Chapter 1.

Comparing the floristic similarity among different plant communities

The CPD has always been recognized as a domain of high environmental heterogeneity (Ab'Sáber 1974, 2003; Andrade-Lima 1981), which is expected to be reflect in the flora of the region. Comparisons using multivariate analysis showing how different sites relate floristically began in the 1990's (Araújo et al. 1999), but only with more data from the 2000's onward studies began to show clearly the differences between the flora of crystalline and sedimentary terrains (Gomes et al. 2006; Cardoso and Queiroz 2007). We generally agree with this position, as sedimentary caatingas formed clear groups, even considering that the sedimentary sites were represented as disjunct and far apart sites (Ibiapaba-Araripe basin, Tucano-Jatobá basin and São Francisco Dunes – see Fig. 1; Fig. 2). They were floristically more similar to each other than to nearby crystalline caatingas in the vicinity (Fig. 2; Fig. 3; Fig. 4) (see also a very interesting study using the Leguminosae family in Cardoso and Queiroz 2007). The caatinga sites in Campo Maior (an ecotone between sedimentary caatingas and the cerrados) were in our analyses a subgroup of sedimentary caatinga, but somewhat dissimilar (Fig. 3; Fig. 4; Fig. 5), as these areas are transitional and one could expect species of the cerrado savannas to mix with typical caatinga species. This seems to be the case here, with cerrado species such as *Anacardium occidentale* and *Curatella americana* entering the community (Farias and Castro 2004).

Crystalline caatingas presented a more complex pattern to interpret. Excluding a few outliers in our analyses (Pb-Agr2, BA-Ins3 and PB-Cry3 – See Fig. 3), it seems that species from crystalline caatingas are also a major floristic component in environments such as riverine forests (which appear in our analyses as a subgroup of crystalline caatinga) or agreste (Fig. 3; Fig. 4; Fig. 5). Although riverine forests in the CPD do have a group of characteristic species (e.g. *Ziziphus joazeiro* and *Licania rigida*), these were not enough to make the whole flora very distinct from typical crystalline caatinga sites. This could, to a certain degree, be attributed to the fact that some of the compiled studies (see table S1) sampled large areas, rather than more geographically restricted and well defined riverine forests. Also, studies in the carnauba palm riverine forests (carnaubais) would be of great interest, as this riverine forest type is common in the CPD, but we couldn't find any study in the "carnaubais" to campare.

From the NMS ordination (Fig. 4) it seems that the caatingas in the Chapada Diamantina and arboreal caatingas in Minhas Gerais represent the extremes of a latitudinal gradient of species turnover within the crystalline caatingas. If this is so, this gradient would stretches from the northern crystalline caatinga sites in Ceará and Rio Grande do Norte states to the arboreal caatingas in Bahia and Minas Gerais. But to achieve a clear conclusion more floristic survey along this supposed gradient would be necessary to understand the pattern. What is clear now is that the arboreal caatingas and the caatingas in the Chapada Diamantina had a distinct, peripheral flora in relation to the northern crystalline caatinga sites in the two dimensional ordination (Fig. 4; Fig. 5), but grouped within the crystalline caatingas in the UPGMA (Fig. 3; Fig. S2). This reveals both the floristic particularities (peripheral position in the NMS) and the floristic bounds (floristic connection with crystalline sites in the UPGMA) to the crystalline caatingas. In the study of Santos et al. (2012) the arboreal caatinga was located between the crystalline caatinga and the deciduous forests that occurs within the Cerrado Domain, as expected in a gradient of species turnover. When floristic studies of crystalline caatingas in Bahia state became available, it will be possible to assess to what extent the crystalline caatingas of southern Bahia are similar to the distant located crystalline caatingas of Pernambuco and Ceará or to the nearby caatingas of Chapada Diamantina and Minas Gerais. Unfortunately all available studies on Chapada Diamantina or arboreal caatinga focused only on woody plants (Table 1; Table S1). We recommend that new studies sample the non woody species as well, to provide a more complete picture of the plant diversity of these environments.

Inselberg sites provide a harsh environment, with shallow soils and little edaphic water supply (Porembski 2007). This can be expected to influence their flora, with a set of drought tolerant plants occupying this environment type (Porembski and Barthlott 2000; Porembski 2007). In our comparison the inselbergs had a congruent flora, forming a group distinct from both crystalline and sedimentary caatingas (Fig. 3; Fig. 4; Fig. 5). This is apparently related to the rainfall gradient to which the different inselberg areas are submitted (Chapter 4), with the inselbergs located in dryer areas having a flora very similar to the crystalline caatingas while wetter sites present progressively different floras (Fig. 3; Fig. 4; Fig. 5; Chapter 4).

As a whole we found in our analyses three broad well defined floristic groups within the CPD: sedimentary caatingas and its ecotone to the Cerrado (Campo Maior sites); crystalline caatingas and its associated ecosystems and ecotones (agreste, riverine forests, Chapada Diamantina and arboreal caatinga); and inselbergs. The crystalline caatinga seems to have a latitudinal gradient of species turnover, with the Chapada Diamantina and arboreal caatingas of Minas Gerais the more dissimilar communities within this group

It should be noted that what we call "sedimentary caatingas" here are plant communities generally located in oligotrophic sedimentary soils (Velloso et al. 2002). Both in Chapada Diamantina and northern Minas Gerais there are eutrophic soils derived from calcareous basement. We did not have access to a detailed geologic mapping of the CPD, but it seems that calcareous terrains support a flora more similar to the crystalline caatingas. This is consistent with the presence of many dry forest enclaves inside the Cerrado Domain that share species with both the arboreal and crystalline caatinga (e.g. *Aspidosperma pyrifolium*, *Commiphora leptophloeos* and *Cavanillesia arborea*) (Santos et al. 2007; Felfili et al. 2007; Carvalho and Felfili 2011).

Relative influence of environment type, climate and spatial autocorrelation in structuring plant communities

As we have shown above, there are plant communities forming clear groups for the inselberg, crystalline caatinga and sedimentary caatinga environments. Arboreal caatingas, the caatingas in Chapada Diamantina, the agreste ecotone and riverine forests form a larger, congruent group when joined with the crystalline caatinga environment. In fact, most models show that the environment type, when used as a categorical variable is the most important predictor. Only when we modeled the partitioning for the categories "All sites with data on Woody plants Sites (n= 70)", did climate, rather than environment type, emerge as the most important variable. But this is most likely due the higher number of categories used to classify this larger set of sites. While the dataset for "general flora" or "non woody only" used 6 categories to classify the sites, the dataset for "woody flora" needed nine categories to classify all sites (see Fig. 5). As categories as "riverine forests" and "agreste" were floristically redundant with the crystalline caatinga (Fig. 5), this reduced the power of the environment type as an explanatory variable. But, as a whole, environment type was clearly an important variable among the predictor variables. This is very evident when we see that nearby sites in crystalline and sedimentary terrains (CE-Cry1, CE-Sed1 and CE-Sed2 – See Table S1; Fig. 2; Fig. 3 and Figs. S1-S3) grouped with distant sites in the same environment, not with neighboring areas of different habitats. The same patter was found by Cardoso and Queiroz (2007) for the Leguminosae family in crystalline and sedimentary sites in Bahia.

The role of climate and spatial autocorrelation was less clear, but generally relevant in defining plant communities. Although these variables were not significant when tested with the "Woody plants for sites with data on general flora" dataset (n= 31), their influence were significant for the larger woody plant dataset ("All sites with data on Woody plants Sites" n= 70) (Table 2). Comparing only the reduced, more homogeneous dataset (only the 31 sites for which we have data on general flora), it seems that the variables analyzed were more important in structuring the non woody component (20.7% of total variation explained by the three variables) than the woody (14.1% of the variation). This suggests that non woody plants were more dependent on climate, environment type and space autocorrelation than woody plants. This could be a consequence of the interaction between plant's life-cycles and human impacts on vegetation. Non woody plants are mostly short lived therophytes (see Chapter 4) but the woody plants have a much longer life-cycle, being more strongly influenced by long term impacts (e.g. logging, fire, etc), while non woody plants could be more responsive to edaphic and short term climatic influence. As woody plants have long life-cycles, it is expected that they will more influenced by and will respond strongly to long term impacts, while the impacts on short-lived non woody plants will be less evident, as new generations will be established and will be responsive to climate within a shorter time period after disturbance.

Examining the relative influence of space and climate on the species turnover for woody and non woody plants controlling for an equal the number of sites (Fig. 7; Fig. 8), we see that the turnover and regression coefficient of the model (R^2) for non woody species was larger for both factors. This suggests that non woody plants are really being more influenced by these variables than woody plants, which also could explain the non significant result of variation partitioning for woody plants for the same dataset (Table 2). But irrespective of whether woody, non woody or general flora is being surveyed, it is important to call attention to the small proportion of the variation explained by all models (Table 2). This is most likely related to the influence of historical variables (probably anthropogenic impacts and stochastic environmental events (e.g. prolonged droughts), which can potentially alter the plant communities.

Conclusions

The idea that the Caatinga Phytogeographical Domain has at least two floristic nuclei, one in crystalline and other in sedimentary sites was corroborated here. But we also show a more complete synthesis for the Caatinga, analyzing the floristic relationships of other environments within the CPD. Besides the sedimentary caatingas (and the Campo Maior ecotone) and crystalline caatingas (and riverine forests and agreste). Arboreal caatingas and the caatingas in the Chapada Diamantina seem to form the periphery of a long latitudinal gradient within the CPD. A better understanding would be achieved with data on the crystalline caatingas of Bahia and with data on non woody plants from the arboreal caatinga and the caatinga in the Chapada Diamantina. We also found that, to a great extent, inselbergs have a flora very distinct from both crystalline and sedimentary sites. A few inselbergs (those located in drier sites) had a flora very close to the crystalline caatinga, but most of the inselbergs hadn't. We show here that the environment type is more important than climate gradients and spatial autocorrelation to structure plant communities in the CPD, and that the effect of both climate and spatial distances was not the same for the woody and the non woody components. Non woody plants had higher beta diversity and responded more to environment type, climate and spatial autocorrelation than woody plants. The variation explained by the models, though, was low and it seems that historical variables (most likely anthropogenic impacts - not included in the model) are responsible, in the form of the large residuals of the models, for most of the variation.

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Appendix

Table S1– List of references used in the biogeographical analysis

Nº	Environment type	Code of the site	State	Assemblage sampled	Authors	year	Journal
1	Arboreal Caatinga	MG-Arb1-Januária	MG	Only woody plants	Ratter, J.A.; Askew, G.P.; Montgomery, R.F.; Gifford, D.R.	1978	Revista Brasileira de Botânica 1: 47-58
2	Arboreal Caatinga	MG-Arb8-Juvenília	MG	Only woody plants	Santos, R.M.; Vieira, F.A.; Santos, P.F.; Morais, V.M.; Medeiros, M.A.	2008	Revista Caatinga 21(4): 154-162
3	Arboreal Caatinga	MG-Arb3-Juvenília	MG	Only woody plants	Santos, R.M.; Vieira, F.A.; Fagundes, M.; Nunes, Y.R.F.; Gusmão, E.	2007	Revista Árvore 31(1): 135-144
4	Arboreal Caatinga	MG-Arb4-Juvenília	MG	Only woody plants	Santos, R.M.; Vieira, F.A.; Fagundes, M.; Nunes, Y.R.F.; Gusmão, E.	2007	Revista Árvore 31(1): 135-144
5	Arboreal Caatinga	MG-Arb5-Juvenília	MG	Only woody plants	Santos, R.M.; Vieira, F.A.; Fagundes, M.; Nunes, Y.R.F.; Gusmão, E.	2007	Revista Árvore 31(1): 135-144
6	Arboreal Caatinga	MG-Arb6-Juvenília	MG	Only woody plants	Santos, R.M.; Vieira, F.A.; Fagundes, M.; Nunes, Y.R.F.; Gusmão, E.	2007	Revista Árvore 31(1): 135-144
7	Arboreal Caatinga	MG-Arb7-Juvenília	MG	Only woody plants	Santos, R.M.; Vieira, F.A.; Fagundes, M.; Nunes, Y.R.F.; Gusmão, E.	2007	Revista Árvore 31(1): 135-144
8	Arboreal Caatinga	MG-Arb2-Juvenília	MG	Only woody plants	Santos, R.M.; Barbosa, A.C.M.C.; Almeida, H.S.; Vieira, F.A.; Santos, P.F.; Carvalho, D.A.; Oliveira-Filho, A.T.	2011	Cerne 17(2): 247-258
9	Arboreal Caatinga	MG-Arb9-Montalv	MG	Only woody plants	Santos, R.M.; Vieira, F.A.; Fagundes, M.; Nunes, Y.R.F.; Gusmão, E.	2007	Revista Árvore 31(1): 135-144
10	Caatinga in Agreste (Ecotone to the Atlantic Forest)	PB-Agr3-Areia	PB	Only woody plants	Pereira, I.M.; Andrade, L.A.; Sampaio, E.V.S.B.; Barbosa,M.R.V. (includes Pereira et al 2001; 2002)	2003	Biotropica 35(2): 154-165
11	Caatinga in Agreste (Ecotone to the Atlantic Forest)	PB-Agr2-LagoaSeca	PB	Woody and non woody plants	Lourenço, C.E.L.; Barbosa, M.R.V.	2003	Revista Nordestina de Biologia 17(1/2): 23-58
12	Caatinga in Agreste (Ecotone to the Atlantic Forest)	PB-Agr1-Pocinhos	PB	Only woody plants	Andrade, L.A.; Oliveira, F.X.; Neves, C.M.L.; Felix, L.P.	2007	Revista Brasileira de Ciências Agrárias 2(2): 135-142
13	Caatinga in Agreste (Ecotone to the Atlantic Forest)	PE-Agr2-BrejoMDeus	PE	Only woody plants	Andrade, W.M.; Lima, E.A.; Rodal, M.J.N.; Encarnação, C.R.F.; Pimentel, R.M.M.	2009	Revista de Geografia 26(2): 161-184
14	Caatinga in Agreste (Ecotone to the Atlantic Forest)	PE-Agr1-Caruaru	PE	Woody and non woody plants	Alcoforado-Filho, F.G.; Sampaio, E.V.S.B.; Rodal, M.J.N.	2003	Acta Botanica Brasilica 17(2): 287-303
15	Caatinga in Agreste	PE-Agr4-	PE	Only non woody	Reis, A.M.S.; Araújo, E.L.; Ferraz,	2006	Revista Brasileira

	(Ecotone to the Atlantic Forest)	Caruaru		plants	E.M.N.; Moura, A.N. (includes Araújo et al 2005)		de Botânica 29(3): 497-508
16	Caatinga in Campo Maior (Ecotone to the Cerrado)	PI-CMaior1-CMaior	PI	Only woody plants	Barros, J.S.; Castro, A.A.J.F.	2006	Interações 8(13): 119-130
17	Caatinga in Campo Maior (Ecotone to the Cerrado)	PI-CMaior2-CMaior	PI	Only woody plants	Farias; R.R.S.; Castro, A.A.J.F.	2004	Acta Botanica Brasilica 18(4): 949-963
18	Caatinga in the Chapada Diamantina	BA-C.Diam3-Contendas	BA	Only woody plants	Lima, P.C.F.; Lima, J.L.S.	1998	Acta Botanica Brasilica 12(3): 441-450
19	Caatinga in the Chapada Diamantina	BA-C.Diam2-Jacobina	BA	Only woody plants	Ramalho, C.I.; Andrade, A.P.; Félix, L.P.; Lacerda, A.V.; Maracajá, P.B.	2009	Revista Caatinga 22(3): 182-190
20	Caatinga in the Chapada Diamantina	BA-C.Diam1-SBonfim	BA	Only woody plants	Ramalho, C.I.; Andrade, A.P.; Félix, L.P.; Lacerda, A.V.; Maracajá, P.B.	2009	Revista Caatinga 22(3): 182-190
21	Crystalline Caatinga	CE-Cry1-Crateús	CE	Woody and non woody plants	Araújo, F.S.; Costa, R.C.; Lima, J.R.; Vasconcelos, S.F.; Girão, L.C.; Sobrinho, M.S.; Bruno, M.M.A.; Souza, S.S.G. et al.	2011	Rodriguésia 62(2): 341-366
22	Crystalline Caatinga	CE-Cry2-Quixadá	CE	Woody and non woody plants	Costa, R.C.; Araújo, F.S.; Lima-Verde, L.W.	2007	Journal of Arid Environments 68: 237-247
23	Crystalline Caatinga	PB-Cry3-SJCariri	PB	Only non woody plants	Andrade, M.V.M.; Andrade, A.P.; Silva, D.S.; Bruno, R.L.A.; Guedes, D.S.	2009	Revista Caatinga 22(1): 229-237
24	Crystalline Caatinga	PB-Cry5-SJCordeiros	PB	Only woody plants	Barbosa, M.R.V.; Lima, I.B.; Lima, J.R.; Cunha, J.P.; Agra, M.F.; Thomas, W.W.	2007	Oecologia Brasiliensis 11(3): 313-322
25	Crystalline Caatinga	PB-Cry9-SBranca	PB	Only woody plants	Gomes, M.A.F.	1980	Vegetalia 14: 1-27
26	Crystalline Caatinga	PE-Cry11-Bet/Florest	PE	Only non woody plants	Pessoa, L.M.; Rodal, M.J.N.; Silva, A.C.B.L.; Costa, K.C.C.	2004	Revista Nordestina de Biologia 18(1): 27-53
27	Crystalline Caatinga	PE-Cry16-Custodia	PE	Only woody plants	Rodal, M.J.N.; Martins, F.R.; Sampaio, E.V.S.B.	2008	Revista Caatinga 21(3): 192-205
28	Crystalline Caatinga	PE-Cry17-Floresta	PE	Woody and non woody plants	Santos, M.F.A.V.; Guerra, T.N.F.; Sotero, M.C.; Santos, J.I.N.	2009	Rodriguésia 60(2): 389-402
29	Crystalline Caatinga	PE-Cry5-Bet/Floresta	PE	Woody and non woody plants	Costa, K.C.; Lima, A.L.A.; Fernandes, C.H.M.; Silva, M.C.N.A.; Lins e Silva, A.C.B.; Rodal, M.J.N.	2009	Revista Brasileira de Ciências Agrárias 4(1): 48-54
30	Crystalline Caatinga	PE-Cry7-SerraTalhada	PE	Only woody plants	Ferraz, E.M.N.; Rodal, M.J.N.; Sampaio, E.V.S.B.; Pereira, R.C.A.	1998	Revista Brasileira de Botânica 21(1): 7-15
31	Crystalline Caatinga	PE-Cry8-SerraTalhada	PE	Only woody plants	Ferraz, E.M.N.; Rodal, M.J.N.; Sampaio, E.V.S.B.; Pereira, R.C.A.	1998	Revista Brasileira de Botânica 21(1): 7-15
32	Crystalline Caatinga	PE-Cry10-SerraTalhad	PE	Only woody plants	Ferraz, E.M.N.; Rodal, M.J.N.; Sampaio, E.V.S.B.	2003	Phytocoenologia 33(1): 71-92
33	Inselberg	BA-Ins3-Feira	BA	Woody and non woody plants	França, F.; Melo, E.; Santos, A.K.A.; Melo, J.A.N.; Marques, M.; Silva-Filho, M.F.B.; Moraes, L.; Machado, C.	2005	Hoehnea 32(1): 93-101
34	Inselberg	BA-Ins1-Itatim	BA	Woody and non woody plants	França, F.; Melo, E.; Santos, C.C.	1997	Sitientibus 17: 163-176
35	Inselberg	BA-Ins2-Itatim	BA	Woody and non woody plants	França, F.; Melo, E.; Santos, C.C.	1997	Sitientibus 17: 163-184
36	Inselberg	CE-Ins1-Quixadá	CE	Woody and non woody plants	Araújo, F.S.; Oliveira, R.F.; Lima-Verde, L.W.	2008	Rodriguésia 59(4): 659-671
37	Inselberg	PB-Ins2-Esperança	PB	Woody and non woody plants	Porto, P.A.F.; Almeida, A.; Pessoa, W.J.; Trovão, D.; Félix, L.P.	2008	Revista Caatinga 21(2): 214-222
38	Inselberg	PB-Ins3-Puxinanã	PB	Woody and non woody plants	Tölke, E.E.A.; Silva, J.B.; Pereira, A.R.L.; Melo, J.I.M.	2011	Biotemas 24(4): 39-48
39	Inselberg	PE-Ins3-Altinho	PE	Woody and non woody plants	Gomes, P.; Alves, M.	2010	Revista Brasileira de Botânica 33(4): 661-676

40	Inselberg	PE-Ins1-Bezerros	PE	Woody and non woody plants	Gomes, P.; Alves, M.	2009	Edinburgh Journal of Botany 66(2): 329-346
41	Inselberg	PE-Ins2-SJMonte	PE	Woody and non woody plants	Gomes, P.; Alves, M.	2010	Revista Brasileira de Botânica 33(4): 661-676
42	Inselberg	PE-Ins4-Venturosa	PE	Woody and non woody plants	Gomes, P.; Costa, K.C.C.; Rodal, M.J.N.; Alves, M.	2011	Check List 7(2): 173-181
43	Riverine forest	PB-Riv7-Monteiro	PB	Only woody plants	Pegado, C.M.A.; Andrade, L.A.; Félix, L.P.; Pereira, I.M.	2006	Acta Botanica Brasilica 20(4): 887-898
44	Riverine forest	PB-Riv5-SJCariri	PB	Only woody plants	Lacerda, A.V.; Barbosa, F.M.; Soares, J.J.; Barbosa, M.R.V.	2010	Biota Neotropica 10(4): 275-284
45	Riverine forest	PB-Riv6-SJCariri	PB	Only woody plants	Lacerda, A.V.; Barbosa, F.M.; Soares, J.J.; Barbosa, M.R.V.	2010	Biota Neotropica 10(4): 275-284
46	Riverine forest	PB-Riv4-SJCordeiros	PB	Only woody plants	Lacerda, A.V.; Barbosa, F.M.; Soares, J.J.; Barbosa, M.R.V.	2010	Biota Neotropica 10(4): 275-284
47	Riverine forest	PB-Riv1-Taperoá	PB	Only woody plants	Andrade, L.A.; Fabricante, J.R.; Alves, A.S.	2008	Natureza & Conservação 6(2): 61-67
48	Riverine forest	PB-Riv3-SJCariri	PB	Only woody plants	Lacerda, A.V.; Barbosa, F.M.; Barbosa, M.R.V.	2007	Oecologia Brasiliensis 11(3): 331-340
49	Riverine forest	PE-Riv2-Floresta	PE	Woody and non woody plants	Souza, J.A.N.; Rodal, M.J.N.	2010	Revista Caatinga 23(4): 54-62
50	Riverine forest	PE-Riv3-Petrolina	PE	Only woody plants	Nascimento, C.E.S.; Rodal, M.J.N.; Cavalcanti, A.C.	2003	Revista Brasileira de Botânica 26(3): 271-287
51	Sedimentary Caatinga	BA-Sed2-Barra	BA	Woody and non woody plants	Rocha, P.L.B.; Queiroz, L.P.; Pirani, J.R.	2004	Revista Brasileira de Botânica 27(4): 739-755
52	Sedimentary Caatinga	BA-Sed1-Uauá	BA	Woody and non woody plants	Guedes, R.R.	1985	Rodriguésia 37(62): 5-8
53	Sedimentary Caatinga	CE-Sed8-Crateús	CE	Only woody plants	Vasconcelos, S.F.; Araújo, F.S.; Lopes, A.V.	2010	Biodiversity & Conservation 19: 2263-2289
54	Sedimentary Caatinga	CE-Sed1-Crateús	CE	Woody and non woody plants	Araújo, F.S.; Costa, R.C.; Lima, J.R.; Vasconcelos, S.F.; Girão, L.C.; Sobrinho, M.S.; Bruno, M.M.A.; Souza, S.S.G. et al.	2011	Rodriguésia 62(2): 341-366
55	Sedimentary Caatinga	CE-Sed2-Crateús	CE	Woody and non woody plants	Araújo, F.S.; Costa, R.C.; Lima, J.R.; Vasconcelos, S.F.; Girão, L.C.; Sobrinho, M.S.; Bruno, M.M.A.; Souza, S.S.G. et al. (includes Lima et al 2009)	2011	Rodriguésia 62(2): 341-366
56	Sedimentary Caatinga	CE-Sed4-NovoHoriente	CE	Woody and non woody plants	Araújo, F.S.; Sampaio, E.V.S.B.; Figueiredo, M.A.; Rodal, M.J.N.; Fernandes, A.G.	1998	Revista Brasileira de Botânica 21(2): 105-116
57	Sedimentary Caatinga	CE-Sed5-NovoHoriente	CE	Only woody plants	Araújo, F.S.; Sampaio, E.V.S.B.; Rodal, M.J.N.; Figueiredo, M.A.	1998	Revista Brasileira de Biologia 58(1): 85-95
58	Sedimentary Caatinga	CE-Sed6-NovoHoriente	CE	Only woody plants	Araújo, F.S.; Sampaio, E.V.S.B.; Rodal, M.J.N.; Figueiredo, M.A.	1998	Revista Brasileira de Biologia 58(1): 85-95
59	Sedimentary Caatinga	CE-Sed7-NovoHoriente	CE	Only woody plants	Araújo, F.S.; Sampaio, E.V.S.B.; Rodal, M.J.N.; Figueiredo, M.A.	1998	Revista Brasileira de Biologia 58(1): 85-95
60	Sedimentary Caatinga	CE-Sed3-Ubajara	CE	Only woody plants	Araújo, F.S.; Martins, F.R.; Shepherd, G.J.	1999	Revista Brasileira de Biologia 59(4): 663-678
61	Sedimentary Caatinga	PE-Sed1-Buíque	PE	Woody and non woody plants	Andrade, K.V.S.A.; Rodal, M.J.N.; Lucena, M.F.A.; Gomes, A.P.S.	2004	Hoehnea 31(3): 337-348
62	Sedimentary Caatinga	PE-Sed2-Buíque	PE	Woody and non woody plants	Figueiredo, L.S.; Rodal, M.J.N.; Melo, A.L.	2000	Naturalia 25: 205-224
63	Sedimentary Caatinga	PE-Sed3-Buíque	PE	Woody and non woody plants	Gomes, A.P.S.; Rodal, M.J.N.; Melo, A.L.	2006	Acta Botanica Brasilica 20(1): 37-48
64	Sedimentary Caatinga	PE-Sed4-Buíque	PE	Only woody plants	Rodal, M.J.N.; Andrade, K.V.A.; Sales, M.F.; Gomes, A.P.S.	1998	Revista Brasileira de Biologia 58(3):

							517-526
65	Sedimentary Caatinga	PE-Sed5-Ibimirim	PE	Woody and non woody plants	Rodal, M.J.N.; Nascimento, L.M.; Melo, A.L.	1999	Acta Botanica Brasilica 13(1): 15-28
66	Sedimentary Caatinga	PI-Sed1	PI	Only woody plants	Emperaire, L.	1987	Bull. Ecol. 18(4): 431-438
67	Sedimentary Caatinga	PI-Sed3-PadreMarcos	PI	Woody and non woody plants	Oliveira, M.E.A.; Sampaio, E.V.S.B.; Castro, A.A.J.F.; Rodal M.J.N.	1997	Naturalia 22: 131-150
68	Sedimentary Caatinga	PI-Sed2-SJPiauí	PI	Woody and non woody plants	Mendes, M.R.A.; Castro, A.A.J.F.	2010	Check List 6(1): 39-44
69	Transition crystalline/sedimentary	CE-Tran1-Aiuaba	CE	Woody and non woody plants	Lemos, J.R.; Meguro, M.	2010	Revista Brasileira de Biociências 8(1): 34-43
70	Transition crystalline/sedimentary	PE-Tran1-Floresta	PE	Only woody plants	Araújo, E.L.; Sampaio, E.V.S.B.; Rodal, M.J.N.	1995	Revista Brasileira de Biologia 55(4): 595-607
71	Transition crystalline/sedimentary	PE-Tran2-Mirandiba	PE	Woody and non woody plants	Pinheiro, K.; Rodal, M.J.N.; Alves, M.	2010	Revista Caatinga 23(2): 68-77
72	Transition crystalline/sedimentary	PE-TranHerb3-Petrolâ	PE	Only non woody plants	Silva, K.A.; Araújo, E.L.; Ferraz, E.M.N.	2009	Acta Botanica Brasilica 23(1): 100-110
73	Transition crystalline/sedimentary	PI-Tran2-SRNonato	PI	Only woody plants	Lemos, J.R.; Rodal, M.J.N.	2002	Acta Botanica Brasilica 16(1): 23-42
74	Transition crystalline/sedimentary	PI-Tran1-SRNonato	PI	Woody and non woody plants	Lemos, J.R.	2004	Rodriguésia 55(85): 55-66

Table S2- Significative (p< 0.05) regression coefficients between floristic composition of sites and each climate variable available in Bioclim model (Hijmans et al. 2005).

General flora* (n=31)	R2	Non-Woody plants for sites with data on general flora (n=31)	R2	Woody plants for sites with data on general flora (n=31)	R2	All sites with data on Non-Woody plants (N=35)	R2	All sites with data on Woody plants Sites (N=70)	R2
Precipitation of Wettest Quarter	0.0684	Precipitation of Wettest Quarter	0.0679	Precipitation Seasonality	0.0722	Mean Temperature of Wettest Quarter	0.0562	Annual Precipitation	0.0511
Mean Temperature of Wettest Quarter	0.0657	Mean Temperature of Wettest Quarter	0.0634	Mean Temperature of Wettest Quarter	0.0625	Precipitation of Wettest Quarter	0.0569	Temperature Annual Range	0.0414
Min Temperature of Coldest Month	0.0494	Min Temperature of Coldest Month	0.0465	Mean Temperature of Coldest Quarter	0.0529	Mean Temperature of Coldest Quarter	0.044	Mean Diurnal Range	0.0402
Precipitation of Driest Month	0.0427	Mean Diurnal Range	0.0427	Mean Temperature of Driest Quarter	0.0491	Max Temperature of Warmest Month	0.0398	Mean Temperature of Driest Quarter	0.0324
Mean Temperature of Coldest Quarter	0.0433	Precipitation of Wettest Month	0.0411	Max Temperature of Warmest Month	0.0445	Precipitation of Driest Month	0.0366	Precipitation Seasonality	0.0301
Mean Diurnal Range	0.041					Annual mean temperature	0.0387	Temperature Seasonality	0.0224
								Isothermality	0.0212
								Precipitation of Wettest Month	0.0219
								Mean Temperature of Wettest Quarter	0.0211
								Precipitation of Driest Quarter	0.0196
								Annual mean temperature	0.0178
								Max Temperature of Warmest Month	0.0187
								Mean Temperature of Coldest Quarter	0.0157
								Precipitation of Coldest Quarter	0.0156
								Mean Temperature of Warmest Quarter	0.015
								Precipitation of Wettest Quarter	0.0146

* Only those studies with data on both woody and non woody plants for the same site.

Table S3- Significative ($p < 0.05$) regression coefficients between floristic composition and each spatial component (PCNM).

General flora* (n=31)	R2	Non-Woody plants for sites with data on general flora (n=31)	R2	Woody plants for sites with data on general flora (n=31)	R2	All sites with data on Non-Woody plants (N=35)	R2	All sites with data on Woody plants Sites (N=70)	R2
PCNM1	0.063	PCNM3	0.0584	PCNM1	0.0661	PCNM3	0.0545	PCNM1	0.0608
PCNM3	0.0588	PCNM2	0.0575	PCNM3	0.0598	PCNM2	0.0534	PCNM2	0.0593
PCNM2	0.0568	PCNM1	0.0555	PCNM2	0.0556	PCNM1	0.0489	PCNM3	0.029
PCNM7	0.0461	PCNM7	0.0454	PCNM7	0.0463	PCNM5	0.0415	PCNM15	0.0277
PCNM4	0.0426	PCNM4	0.0401	PCNM4	0.0421	PCNM7	0.041	PCNM5	0.0246
						PCNM4	0.035	PCNM4	0.0227
								PCNM9	0.021
								PCNM8	0.0187
								PCNM6	0.0185
								PCNM19	0.0179

* Only those studies with data on both woody and non woody plants for the same site.

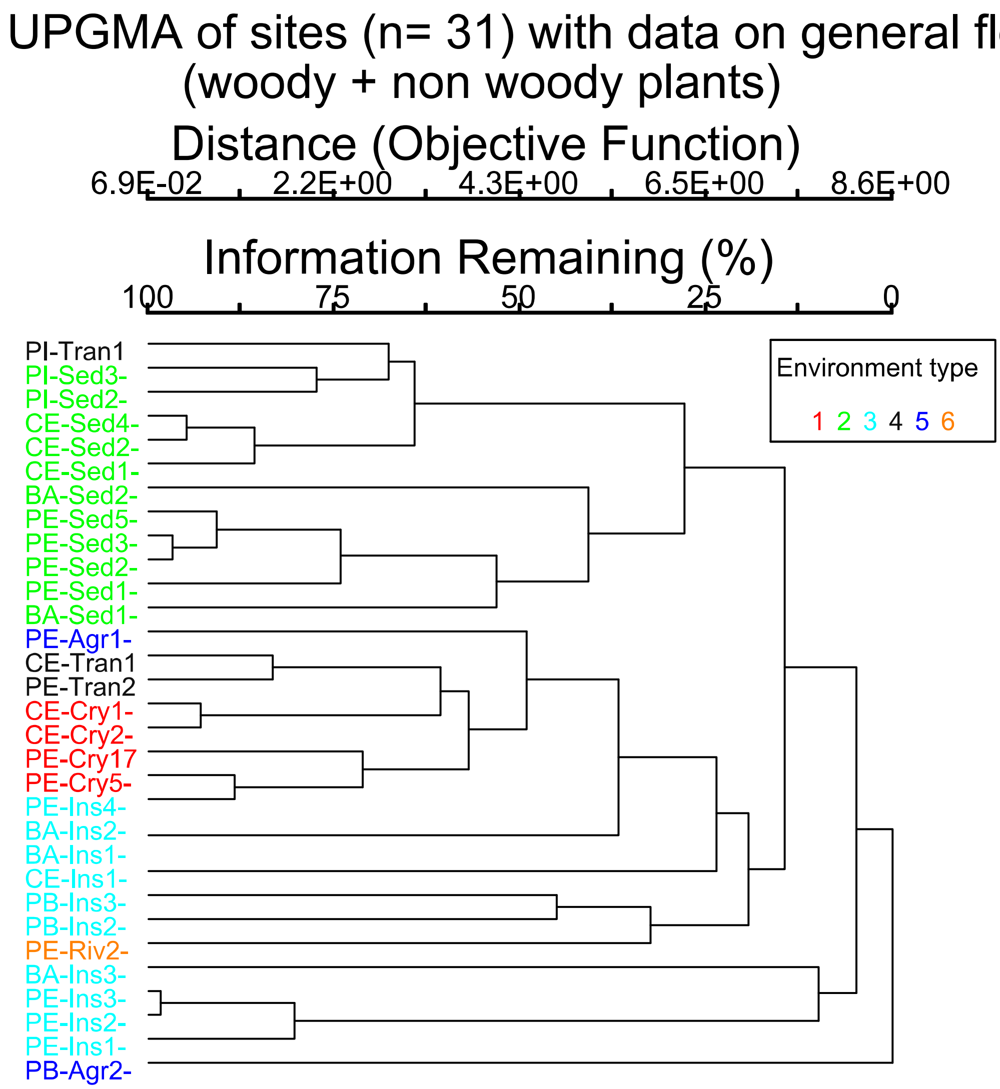

Fig. S1- UPGMA group analysis for the 31 sites with data on general flora (woody and non woody plants) showing the floristic relationships between the different areas based on the complete list of species for each site. Environmental types: 1- crystalline caatinga; 2- sedimentary caatinga; 3- inselbegs; 4- transition crystalline and sedimentary sites; 5- Caatinga in the Agreste Ecotone; 6- Riverine forests.

Fig. S2- UPGMA group analysis for the 70 sites with data on woody plants, showing the floristic relationships between the different areas based only on the woody plants reported in each site. Environmental types: 1- crystalline caatinga; 2- sedimentary caatinga; 3- inselbegs; 4- transition crystalline and sedimentary sites; 5- Caatinga in the Agreste Ecotone; 6- Riverine forests; 7- Caatinga in the Chapada Diamantina; 8- Caatinga in Campo Maior Ecotone; 9- Arboreal Caatinga of northern Minas Gerais.

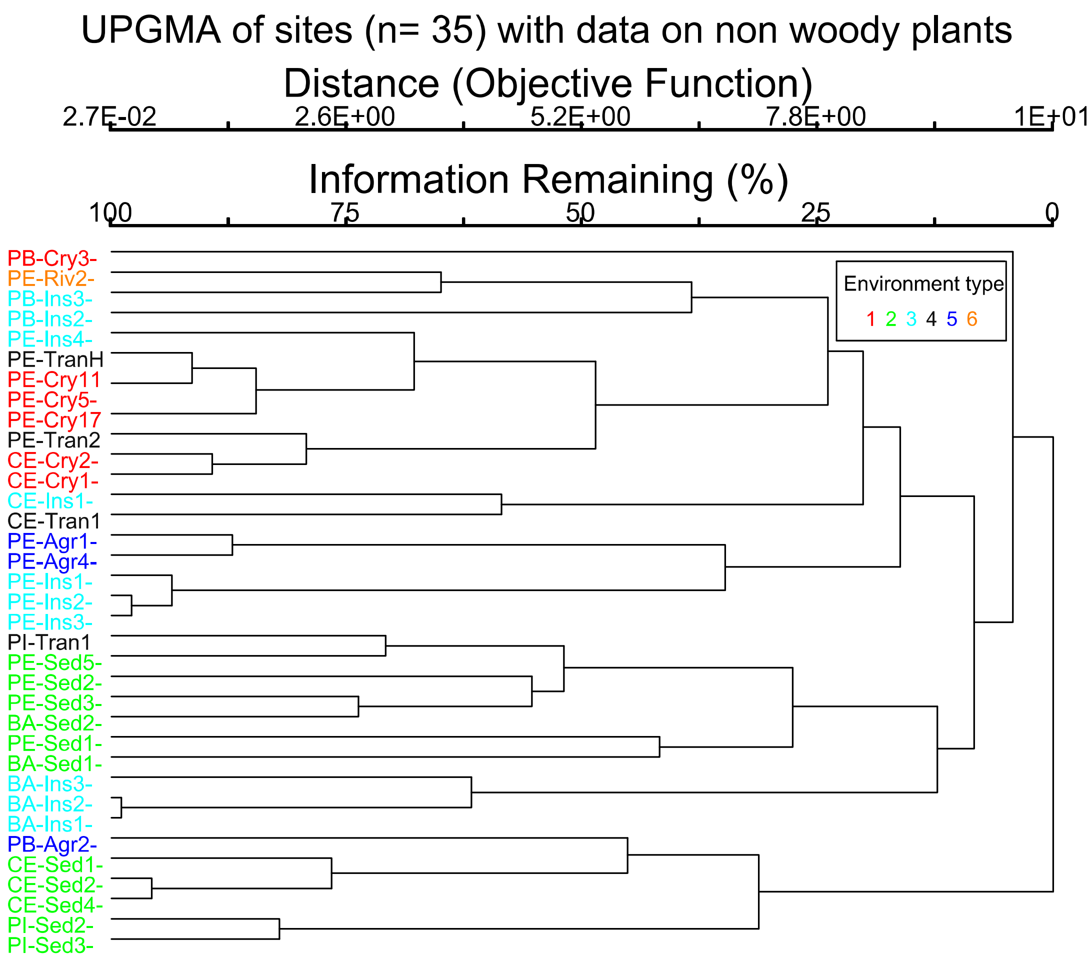

Fig. S3- UPGMA group analysis for the 35 sites with data on non woody plants, showing the floristic relationships between the different areas based only on the non woody plants reported in each site. Environmental types: 1- crystalline caatinga; 2- sedimentary caatinga; 3- inselbegs; 4- transition crystalline and sedimentary sites; 5- Caatinga in the Agreste Ecotone; 6- Riverine forests.

CAPÍTULO 4- Life-form spectra and plant communities in a seasonally dry tropical formation of South America[8]

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ABSTRACT

Seasonally dry tropical formations (SDTF) are considered to be a singular biome in both structure and function. Of the SDTF, the largest area is the semiarid Caatinga, located in Northeastern South America. It occurs in terrains of both crystalline bedrock and sedimentary basins, besides many isolated inselbergs. We investigated here, on a subcontinental scale, the relative influence of climate, environment type (crystalline, sedimentary or inselberg environments) and spatial autocorrelation as factors structuring plant communities in this region. We also addressed the structural differences between plant communities in these three environments using Raunkiaer's life-form spectra. We compared the flora and spectra among environment types within Caatinga and between Caatinga and the major world biomes. Species were found to constitute distinct groups in sedimentary, crystalline, and inselberg sites, and both climate and environment type influenced the distribution of species. This suggests that Caatinga has different plant communities in sedimentary and crystalline terrains. But while the flora responded both to climate and substrate, life-form spectra responded to environment type but not to climate, indicating that within a regional semiarid macroclimate substrate is more important than climate gradients in structuring vegetation. Nevertheless in a global scale the biological spectra of Caatinga differ from those of major world biomes, suggesting that semiarid vegetation have biological spectra between those of deserts and rainforests.

Key-words: Biogeography, dry formations, life-forms, Raunkiaer, seasonally dry tropical forests, South American vegetation.

INTRODUCTION

Plant life-forms integrate several adaptive responses of plant species to key environmental conditions such as temperature, rainfall regime and frequency of wildfires constituting a key feature of vegetation physiognomy (Cain 1950, Box 1981, Batalha & Martins 2002, Cornelissen et al. 2003). As primary physiological processes are associated with the form of plants, the biological spectrum of life-forms of a community also reveals general patterns of the relationship between plants and their environment (Batalha & Martins 2002, Cornelissen *et al.* 2003). In this sense, a biological spectrum can be interpreted as a spectrum of functional strategies present in the community.

In South America, there are several formations that annually experience a long dry season (Sarmiento 1975, Pennington et al. 2000, 2009). These formations were called Dry Plant Formations of South America (DPFSA) by Sarmiento (1975) or Seasonally Dry Tropical Forest (SDTF) by Pennington *et al.* (2000). Dry tropical plant formations group a set of physiognomically variable plant communities that share many ecological features and botanical taxa leading Pennington *et al.* (2000; 2009) to claim that dry formations constitute a biogeographically cohesive group of formations that is distinct from forests and savannas.

The largest area of SDTFs is the Caatinga Phytogeographical Domain, which encompasses more than 800,000 km^2 in northeastern Brazil (Andrade-Lima, 1981; Pennington *et al.,* 2000; Queiroz, 2006) and comprises one of the largest semiarid regions of the world (Miles *et al.,* 2006; Olson *et al.,* 2001). Undersampled for most of the twentieth century, botanical survey in Caatinga has intensified in recent decades, allowing for the first time a synthesis about life-form spectra in this large semiarid ecoregion of the world.

Three environmental types comprise some of the most common plant communities within the Caatinga: communities in crystalline terrains; in sedimentary terrains and in inselbergs (Chapter 3). Crystalline terrains are the most widespread environment, occurring in areas where soils are shallow, but rich in nutrients (Sampaio, 2010; Velloso *et al.,* 2002). Large sedimentary basins also exist within this region, where soils are much deeper than in crystalline terrains, but usually poorer in nutrients (Sampaio, 2010; Velloso *et al.,* 2002). Inselbergs are sites where the basement rock is completely exposed, and soils are virtually non-existent or restricted to cracks or small depressions in the rock (Porembski, 2007; Gomes & Alves, 2010). Plants in sedimentary areas are expected to have a better water supply in the dry season, but fewer nutrients for their growth (Sampaio, 1995; Araújo *et al.,* 2011), whereas plants in crystalline sites have less edaphic water, but better nutrient supplies. Inselbergs have the harshest edaphic condictions, with extremely shallow soils.

Although biogeographical studies including inselbergs in Caatinga are rare (but see Santos et al. 2012), there are some studies showing that angiosperm species differ between crystalline and sedimentary sites (Gomes et al. 2006, Queiroz 2006, Cardoso & Queiroz 2007). Nevertheless, a comprehensive comparison discussing differences in biological spectrum is still missing. Considering that there are edaphic differences among crystalline and sedimentary sites and that the angiosperm floras differ, we wonder whether their communities would also have different functional strategies to face their environment. And considering that Caatinga thrive under a semiarid climate, we also wonder how their functional strategies would relate to other world biomes.

Our goal was to investigate the hypotheses that (a) within a general semiarid macroclimate the substrate (crystalline, sedimentary or inselberg terrains), and not climatic gradients, is the main driver assembling plant communities and their functional strategies; and (b) on a global scale, the semiarid climate determines life-form spectra that are distinguishable from other world biomes. To accomplish this task, we addressed the following questions as guidelines: (1) does the angiosperm flora of plant communities differ between crystalline, sedimentary and inselberg sites? (2) Do life-form spectra differ between communities in crystalline, sedimentary and inselberg sites? (3) Can climate variables explain functional (biological spectrum) and floristic (species similarity) differences between habitat types? (4) Has the Caatinga a distinctive biological spectrum when compared to other world biomes?

To compare plant communities between environments in Caatinga we have to disentangle the effects of climate from those of other spatial factors. We thus devised four possible scenarios:

(I) Climate gradients alone are the main factor structuring the flora of dry formations: in this case we would not expect to find clear floristic or structural groups using ordination techniques, but only smooth gradients of species turnover with climate alone explaining most of the variance.

(II) Substrate alone is the main factor structuring plant communities: in this case we would expect to find clear floristic and structural groups associated with each environment type, but climate would not show significant influence on the data.

(III) Neither substrate nor climate structure plant communities, but spatial autocorrelation alone is the main force driving similarity between communities: this third case would arise if spatial proximity (spatial autocorrelation) is the only relevant factor. In this case, the closest areas will always have the greatest floristic resemblance and no significant floristic group associated with any particular environment type is expected.

(IV) Differences in substrate are the main driver for assembling plant communities, but climate play a role in shaping communities within each environment: in this case, we expect to find clear separate and significant groups in each environment, but we would also expect to detect a significant influence of climate on species composition and/or life-form spectra throughout the Caatinga domain.

METHODS

Ecological data - We compiled from the literature all floristic surveys we could locate which report Raunkiaer's life-forms for species of the Caatinga domain. We considered only surveys which reported the life-form of the general flora (*i.e.* we did not include papers addressing only woody or only herbaceous plants). We grouped the plants in spectra composed of the five original categories proposed by Raunkiaer. When a different life-form was reported for a species, we translated it back to Raunkiaer's original system: aerophytes, epiphytes and hemiparasites were considered phanerophytes; cacti and succulent plants were considered phanerophytes or chamaephytes, depending on the size of the adult plant; climbers were reclassified as phanerophyte, chamaephyte, or therophyte, depending on their ability to survive the dry season. When the authors of the original papers did not classify a species in any category, we attributed it a life-form based on our knowledge or after consulting colleagues (see also the Supplementary data).

After assigning each species to one Raunkiaer's life-form we classified each survey we located in one of three environment categories: (1) caatinga on crystalline terrains; (2)

caatinga on sedimentary terrains; and (3) inselbergs (Fig. 1). The inselbergs were further divided in two subcategories as follows. Between the very humid Atlantic rainforest close to the coast and the inland semiarid Caatinga, there is a narrow ecotonal zone known as *Agreste*, which has a more benign climate and less strong rain seasonality (Table 1). Four of our inselbergs occurred in this transitional zone (França *et al.,* 2005; Porto *et al.,* 2008; Gomes & Alves, 2010) and were termed *inselbergs in the agreste*. One inselberg was located within an area of typical crystalline semiarid caatinga (Araújo *et al.,* 2008) and was termed *inselberg in caatinga*.

To evaluate the influence of climate in the plant communities we obtained climatic data for each site from the global climate model WorldClim (Hijmans *et al.,* 2005) using the DIVA GIS 7.3 software (Hijmans, 2011): annual mean temperature, total annual precipitation, precipitation seasonality, precipitation of the wettest quarter, and precipitation of the driest quarter (Table 1).

Table 1. Floristic surveys with Raunkiaer's life-forms of crystalline and sedimentary caatingas and inselbergs in the Caatinga and the Agreste. Coordinates in decimal degrees. Climate data from World Clim (Hijmans *et al.* 2005).

Site	Area code	Reference	Latitude	Longitude	Annual Mean Temperature (ºC)	Annual Precipitation (mm)	Precipitation Wettest Quarter (mm)	Precipitation Driest Quarter (mm)	Precipitation Seasonality
Crystalline caatinga in Crateús municipality	Cry-caa1	Araújo *et al.* (2011)	-5.13333	-40.8667	25.8	784	541	6	118.1
Crystalline caatinga in Floresta and Betânia municipalities	Cry-caa2	Costa *et al.* (2009)	-8.3125	-38.1953	23.1	588	333	21	90.4
Crystalline caatinga in Quixadá municipality	Cry-caa3	Costa *et al.* (2007)	-4.82611	-38.9692	26.5	769	478	10	106.3
Crystalline caatinga in Floresta and Betânia municipality	Cry-caa4	Rodal *et al.* (2005)	-8.308944	-38.2019	23.1	588	333	21	90.4
Crystalline caatinga in Floresta municipality	Cry-caa5	Rodal *et al.* (2005)	-8.475861	-38.4804	24.8	530	296	16	90.6
Sedimentary caatinga in Crateús municipality 1	Sed-caa1	Araújo *et al.* (2011)	-5.16667	-40.9333	23.2	955	621	20	108.2
Sedimentary caatinga in Crateús municipality 2	Sed-caa2	Araújo *et al.* (2011)	-5.13333	-40.9	23.7	924	609	17	110.1
Sedimentary caatinga in S. José do Piauí municipality	Sed-caa3	Mendes & Castro (2010)	-6.85361	-41.4708	24.8	794	458	9	99.7

Inselberg in Caatinga region in Quixadá municipality	Ins-caa	Araújo *et al.* (2008)	-4.95572	-39.0244	27	771	480	10	106.1
Inselberg in Agreste region in São Joaquim do Monte municipality	Ins-agr1	Gomes & Alves (2010)	-8.38194	-35.8439	21.4	792	361	53	65.1
Inselberg in Agreste region in Altinho/Agrestina municipality	Ins-agr2	Gomes & Alves (2010)	-8.39139	-36.0103	21	621	267	45	62.7
Inselberg in Agreste region in Esperança municipality	Ins-agr3	Porto *et al.* (2008)	-7.01689	-35.8806	21.6	818	341	51	63.1
Inselberg in Agreste region in Feira de Santana municipality	Ins-agr4	França *et al.* (2005)	-12.27167	-39.0608	23.5	847	274	128	30.6

Floristic analysis - To address our first question we built a matrix with species incidence for each site and assessed the floristic relationship of the sites using a cluster analysis. We checked and standardized synonyms using the Plantminer web tool (Carvalho *et al.,* 2010) and assumed that plants reported with determinations qualified by cf. or aff. were correctly identified, but excluded from the analysis plants reported only to genus/family level and exotic species. We then performed an UPGMA cluster analysis with Sørensen index, which ignores shared absences between sites being compared and gives more weight to confirmed double presences (Legendre & Legendre, 1998; McCune & Grace, 2002). We tested the significance of the floristic groups with a Multi-Response Permutation Procedure (MRPP) with 1,000 permutations (McCune & Grace, 2002). The MRPP is similar to the analysis of variance and compares dissimilarities within and among groups. If two groups are really different in their species composition, then the average of the within-group compositional dissimilarities is smaller than the average of the dissimilarities between two random collections of sampling units drawn from the entire population (McCune & Grace, 2002). We performed the UPGMA in PC-ORD 6.0 (McCune & Mefford, 2011) and the MRPP in the 'Vegan' package (Oksanen *et al.,* 2010) in R environment (R Development Core Team, 2010).

Life-form analysis - To answer our second question we classified the sites in the same categories of environment: crystalline caatinga, sedimentary caatinga, inselberg in the agreste, and inselberg in the caatinga (Table 2) and then built a matrix showing the Raunkiaer's life-form spectrum for each site. We then ordered the life-form spectra among the sites with a Nonmetric Multidimensional Scaling Analysis (NMS) with Euclidian distances (Legendre & Legendre, 1998; McCune & Grace, 2002). We performed the NMS with PC-ORD 6.0 (McCune & Mefford, 2011) and choose two axes to represent the data (two axes was the best solution after pilot tests using the autopilot mode of the software and 250 runs).We also tested for the significance of the groups with a MRPP with 1,000 permutations using the 'vegan' package (Oksanen *et al.*, 2010) in the R environment (R Development Core Team, 2010).

Table 2. Biological spectra in the Caatinga domain, northeastern Brazil, with reclassified life-forms to match the original Raunkiaer's categories. Ph: phanerophyte; Ch: chamaephyte; He: hemicryptophyte; Cr: cryptophyte; Th: therophyte.

Sites	life-form class (%)					Reference
	Ph	Ch	He	Cr	Th	
Crystalline Caatinga						
Crateús, CE	28.5	19.0	5.1	1.5	46.0	Araújo *et al.* (2011)
Quixadá, CE	26.3	15.8	12.8	2.3	42.9	Costa *et al.* (2007)
Floresta/Betânia 1, PE	28.7	21.8	12.9	1.0	35.6	Costa *et al.* (2009)
Floresta/Betânia 2, PE	26.1	19.6	15.2	2.2	37.0	Rodal *et al.* (2005)
Floresta, PE	23.4	16.9	16.9	2.6	40.3	Rodal *et al.* (2005)
Sedimentary Caatinga						
Crateús 1, CE	57.4	19.1	3.7	2.9	16.9	Araújo *et al.* (2011)
Crateús 2, CE	58.0	23.2	2.4	3.2	13.2	Araújo *et al.* (2011)
S. José do Piauí, PI	71.3	12.5	8.1	3.7	4.4	Mendes & Castro (2010)
Inselberg in the Caatinga						
Quixadá, CE	26.0	14.3	13.0	2.6	44.2	Araújo *et al.* (2008)
Inselberg in the Agreste						
S. Joaquim do Monte, PE	49.4	6.5	4.5	11.7	27.9	Gomes & Alves (2010)
Altinho/Agrestina, PE	35.2	5.6	3.2	11.2	44.8	Gomes & Alves (2010)
Esperança, PB	39.7	12.7	4.8	0.8	42.1	Porto *et al.* (2008)
Feira de Santana, BA	60.4	18.8	8.3	6.3	6.3	França *et al.* (2005)

Influence of climate variables and space in the community - To answer our third question we tested whether climate variables could explain the floristic and life-form differences among the sites, taking into account the possible effects of spatial autocorrelation of the variables. To this end, we built minimum adequate linear models and selected the best model with the Akaike information criterion (AIC, Diniz-Filho *et al.*, 2008). Because climate variables were intercorrelated, we transformed them with a principal component analysis (PCA) into a set of values of linearly uncorrelated variables (*i.e.* the PCA axes). Also, we summarized the floristic and functional relationships among sites into linear variables with two correspondence analyses (CA). Thus, in the linear models the explanatory variables were the first two axes of the PCA (hereafter the first and second climate components, respectively) plus spatial filters (when we found spatial autocorrelation among variables), and the response variables (species composition or life-form spectrum) were the scores of the first axis of each CA.

To perform this analysis, first we checked for spatial autocorrelation in the (1) climate variables and (2) residuals resultant from the regression between climate and response variables (Diniz-Filho & Bini, 2005; Diniz-Filho *et al.,* 2008). We tested for spatial autocorrelation with spatial correlograms based on Moran's I coefficient (Legendre & Legendre, 1998). When we found spatial autocorrelation in either case, we applied the principal coordinate of neighbour matrices approach (PCNM, Borcard & Legendre, 2002) to extract the spatial structure of the data. The PCNM extracts eigenvectors (*i.e.* spatial filters) from a connectivity matrix, and these eigenvectors express the relationships among plots (Borcard & Legendre, 2002). We selected parsimoniously two spatial filters to incorporate as additional predictors of the response variables in the model, in an attempt to reduce the influence of spatial correlation (Diniz-Filho & Bini, 2005). Then, we used the ordinary least squares method to estimate parameters of the linear regressions between the response variables and the climate components and spatial filters. The best models were those in which the difference between the AIC value of the considered model and the minimum AIC value of all models (Δ_i) was lower than 2 (Diniz-Filho *et al.,* 2008). After selecting the best models, we performed a canonical correspondence analysis (CCA) to test whether there were correlations of floristic and life-form composition with the explanatory variables indicated by the best models. We tested for the significance of these correlations by applying 1,000 Monte Carlo randomizations. We conducted all these procedures of model selection with the software SAM 4.0 (Rangel *et al.,* 2010) and performed the CA and CCA with the software PC-ORD 6.0 (McCune & Mefford, 2011; Peck, 2010).

Differences in life-form spectra between the Caatinga and other biomes - To answer our last question we used the biological spectra of the main world biomes compiled from Batalha & Martins (2002) and compared them with the biological spectra of crystalline caatingas, sedimentary caatingas and inselbergs (the complete matrix used in the analysis is available in the electronic appendix). Then, we analyzed the biological spectra of all sites with a NMS in PC-ORD 6.0 (McCune & Mefford, 2011) in order to evaluate whether the biological spectrum of Caatinga was different from those documented for the main world biomes (a two dimensional solution was used after pilot tests using autopilot mode in PC-ORD software and 250 runs).

RESULTS

A thorough literature search yielded data on Raunkiaer's life-forms for 13 sites within Caatinga, five of which in crystalline caatinga, three in sedimentary caatinga, one in an inselberg in caatinga and four in inselbergs in the agreste (Fig. 1; Table 1; Table 2; Table S2). In all crystalline caatingas and in the inselberg in caatinga, therophytes were the main life-form, whereas the sedimentary caatingas had spectra dominated by the phanerophytic life-form (Table 2; Table S2). Inselbergs in agreste, exposed to a milder rain seasonality than the inselberg in caatinga (see precipitation seasonality in Table 1), had biological spectra between those of crystalline and sedimentary sites.

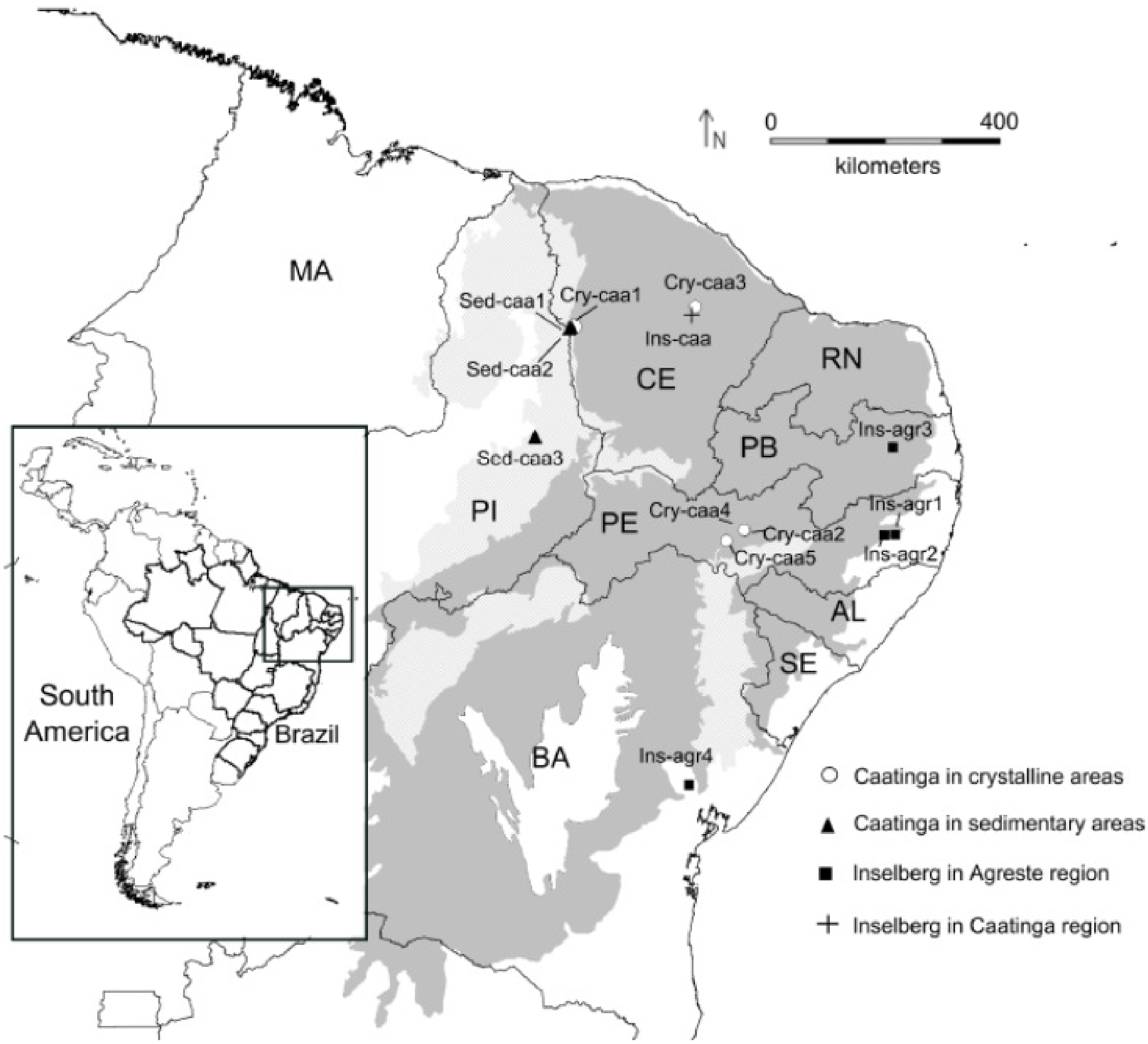

FIGURE 1. The Caatinga domain of NE Brazil (both dark and light grey) and surveys of crystalline caatingas (Cry-caa), sedimentary caatingas (Sed-caa), Caatinga inselberg (Ins-caa) and Agrest inselbergs (Ins-agr). Site codes in Table 1. Dark grey areas are crystalline terrains and light grey hatched areas sedimentary terrains. The white area within Caatinga is the Chapada Diamantina mountain range. Brazilian northeastern states: MA: Maranhão; PI: Piauí; CE: Ceará; RN: Rio Grande do Norte; PB: Paraíba; PE: Pernambuco; AL: Alagoas; SE: Sergipe; BA: Bahia.

Floristic analysis - By comparing species composition among the 13 sites with cluster analysis we found four floristic groups (Fig. 2). The first group was comprised of all crystalline caatingas and the inselberg in caatinga. The second group encompassed three of the four inselbergs in agreste. The third group comprised all sedimentary caatingas. The fourth group, the most distinct in species composition, isolated the last inselberg in agreste. These floristic groups were different from those expected at random ($p < 0.001$), as tested with MRPP analysis. Even when we excluded the discrepant inselberg in agreste (Ins-agr4 – Fig. 1; Fig. 2) the results were equally significant ($p < 0.001$).

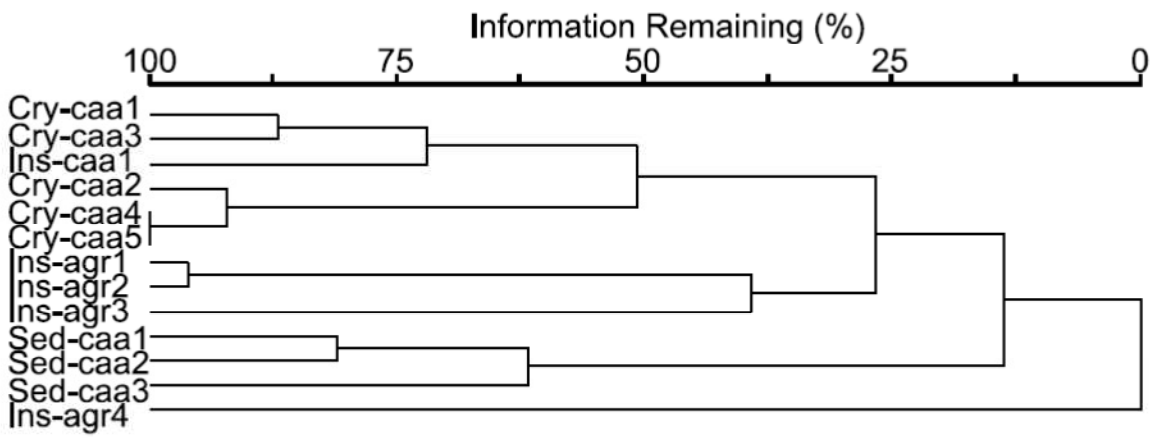

FIGURE 2. UPGMA dendrogram with Sørensen index of floristic similarity among the crystalline (Cry-caa) and sedimentary caatingas (Sed-caa) and inselbergs in the Caatinga (Ins-caa) and Agreste (Ins-agr). The literature, climate and codes associated with each site are shown in Table 1.

Life-form analysis - The NMS of the life-form spectra of the caatingas and inselbergs formed three groups (Fig. 3), all different from those expected by chance ($p < 0.001$). One group comprised all the crystalline caatingas and the inselberg in caatinga and was characterized by the predominance of therophytes (Fig. 3, Table 2; Table S2). A second group encompassed all the sedimentary caatingas and one inselberg in agreste and was characterized by an overrepresentation of phanerophytes (Fig. 3; Table 2; Table S2). The third group comprised the remaining inselbergs in agreste which had a high proportion of phanerophytes, but also a high proportion of therophytes (Fig. 3; Table 2; Table S2). This shows that the differences between crystalline and sedimentary caatingas are not only floristic, but also functional and physiognomic, while the spectra of inselbergs located in the agreste were intermediary between that of crystalline and sedimentary environments.

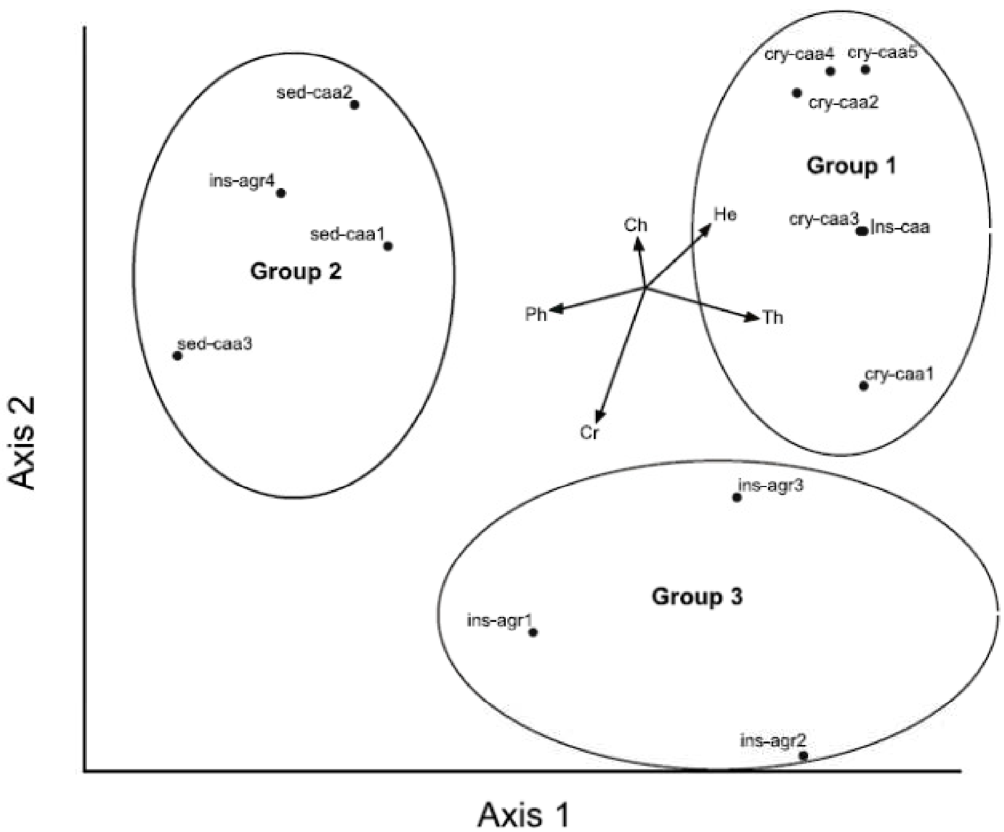

FIGURE 3. Nonmetric Multidimensional Scaling analysis of the biological spectra of 13 sites in the Caatinga. The best solution was a two dimensional configuration: final stress for 2-dimensional solution= 1.09675. Cry-caa and sed-caa refer to crystalline and sedimentary sites, respectively. Ins-caa and ins-agr refer to inselbergs in the Caatinga and Agreste region, respectively. Raunkiaer's life-forms: Ph: phanerophyte; He: hemicryptophyte; Cr: cryptophyte; Ch: chamaephyte; Th: therophyte. The literature, climate data and codes associated with each area are shown in Table 1.

Although exposed to the same regional macroclimate, the life-form spectra between crystalline and sedimentary caatinga were notably distinct and clearly separate in the NMS ordination. The crystalline caatingas were functionally closer to the hot steppes and deserts because of the overrepresentation of therophytes, while the sedimentary caatingas were closer to the tropical forests due the high proportion of phanerophytes (Fig. 4).

Influence of climate variables and space in the community - We found a significant positive spatial autocorrelation for the first distance classes of the climate variables (all Moran's $I > 0.529$, $p < 0.05$) except precipitation of the wettest quarter (Moran's $I = 0.289$, $p = 0.117$). However, the residuals of both floristic and life-form regressions did not show spatial autocorrelation ($p > 0.05$ for first distance classes). The linear model that best explained the floristic variation in the Caatinga (Equation 1) included the two climate components and the two spatial filters ($\Delta_I = 0$), resulting in the final equation shown below, but of the climate components only the first explained significantly the floristic variation in the CCA ($p = 0.041$).

(Equation 1) $Y = -0.262 + 0.646(\text{climate principal component 1}) -0.282(\text{climate principal component 2}) +1.118(\text{spatial filter 1}) – 0.603(\text{spatial filter 2})$

In contrast, the linear model that best explained the life-form variation in the Caatinga included only the second climate component ($\Delta_I = 0$). However, this correlation was not significant according to the Monte Carlo test in the CCA ($p = 0.1451$), which suggests that climate is not the main driver of community structure, although it was relevant for community composition. Thus, both climate differences and spatial factors influenced floristic variation in the Caatinga, whereas biological spectra were not responsive to climate but only to spatial factors, which we attribute to the differential organization of communities in different environments, as will be discussed below.

Differences in life-form spectra between the Caatinga and other biomes - The NMS comparing the Caatinga with the life-form spectra of other world biomes (Fig. 4; Appendix S1) showed an underlying strong relationship between the world biomes and macroclimate, as expected. The distribution of all sites followed a triangular shape with three contrasting biomes at the vertices (Fig. 4). Biomes of hot, wet climates (*i.e.* rainforests) had a predominance of phanerophytes and were positioned in one vertex of the triangle.

Biomes of hot, dry climates (*i.e.* deserts and hot steppes) were positioned in the opposite vertex, with a high proportion of therophytes and chamaephytes. Biomes of cold climates (*i.e.* tundra and cold steppes) were dominated by cryptophytes and hemicryptophytes and occupied the third vertex.

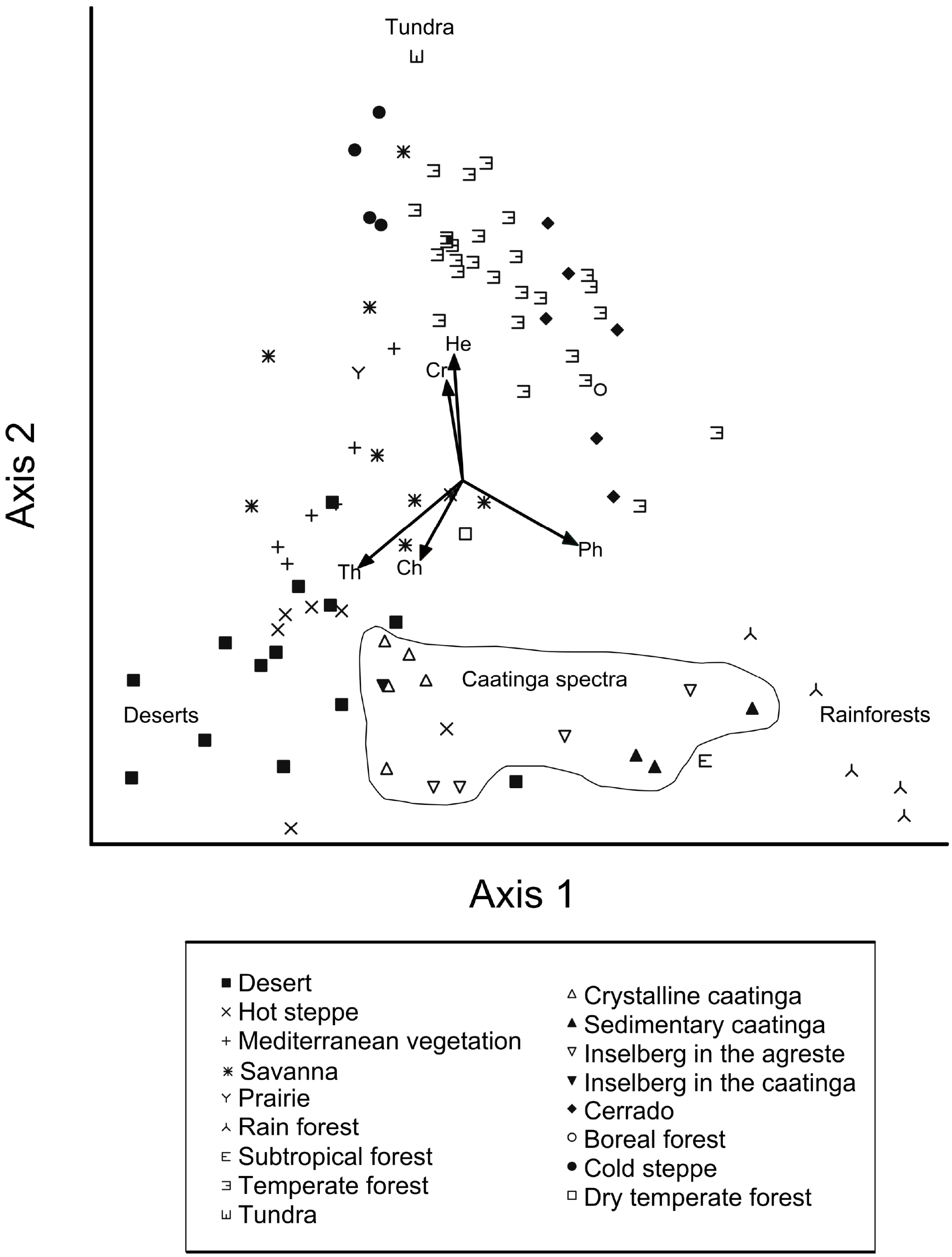

FIGURE 4. Nonmetric Multidimensional Scaling analysis of Raunkiaer's life-form spectra of the Caatinga and major world biomes. The best solution was a two dimensional configuration: final stress for 2-dimensional solution= 7.63037. Raunkiaer's life-forms: Ph: phanerophyte; He: hemicryptophyte; Cr: cryptophyte; Ch: chamaephyte; Th: therophyte.

Biomes exposed to intermediate climatic conditions (*i.e.* savannas, Cerrado, Mediterranean vegetation, and Caatinga) occupied an intermediate position between the vertices. Biological spectra of Savannas and Mediterranean vegetation were intermediate between hot deserts and tundra; whereas those of the Cerrado and temperate forests were intermediate between tundra and rainforests. None of these biomes have spectra that overlap with the semiarid Caatinga, which occupied a position between the spectra of deserts (therophytic vegetation) and rainforests (phanerophytic vegetation - Fig. 4).

DISCUSSION

Floristic analysis - Our results showed a significant floristic distinction between crystalline and sedimentary caatingas, corroborating the results reported by other authors (*e.g.* Gomes *et al.*, 2006; Queiroz, 2006; Rocha *et al.*, 2004). Both space and climate had significant influence in the observed pattern, with each environment harboring distinct communities. This distinction is exemplified by the fact that some sedimentary (sed-caa1 and sed-caa2) and crystalline (cry-caa1) sites studied by Araújo *et al.* (2011) are approximately 10 km apart from each other, but had distinct floras and were grouped respectively with other sedimentary and crystalline sites more than 200 km away. Inselbergs had a more complex pattern, with the driest one having a flora similar to the crystalline caatinga and wetter ones a distinct flora, presumably because wetter areas may have more species from the nearby Atlantic Forest Domain (Rodal et al. 2008). Santos *et al.* (2012) argued that substrate related variables were important factors in segregating floristic units in dry forests of Brazil (including the Caatinga) and that differences environment types may enable different plant communities to coexist within Caatinga. Our results support this view.

Life-form analysis - Beyond having different floristic groups in sedimentary and crystalline terrains we also found clear structural differences. We showed that crystalline caatingas are rich in therophytes, whereas sedimentary caatingas are dominated by phanerophytes. This is the first time that life-form spectra are compared for the whole Caatinga.

Although all sites are exposed to a strong precipitation seasonality and high potential evapotranspiration (Nimer, 1972; Velloso *et al.,* 2002), crystalline sites have generally shallow, stony soils, whereas sedimentary sites have deep soils (Queiroz, 2006; Sampaio, 1995; 2010). Thus, therophytes thrive in the harsh, but nutrient-rich, environment of the crystalline caatinga, completing their life cycle in the rainy season. Living in a nutrient rich environment, therophytes germinate with the raining season, gather from the soil the necessary minerals and complete their life-cycle.

On the other hand, phanerophytes predominate in sedimentary soils that are poorer in nutrients, but can retain water for a long time after the end of the rains (Sampaio 1995, 2010). Since phanerophytes are perennial plants, they can store nutrients in vegetative organs also having a root system that allows them to access water at deeper depths. Thus, it seems that phanerophytes are functionally more efficient in the Caatinga's deep nutrient-poor sedimentary soils because they can access edaphic water for a longer period than therophytes, while retaining most of the nutrients from one rainy season to the other.

While different edaphic environments are known to influence species composition elsewhere (McAuliffe 1994, Balvanera et al. 2011), our conclusions highlight a second aspect of this edaphic influence: the differences were also reflected in the functional attributes of vegetation (i.e. life-forms). While crystalline and sedimentary caatingas had clearly distinct biological spectra, inselbergs constituted a functional gradient between them. Located in a drier climate, the inselberg in caatinga (Ins-caa) had the greatest proportion of therophytes, with a spectrum and flora similar to that of crystalline caatingas. On the other hand the inselberg exposed to the mildest climate (Ins-agr4) had the greatest proportion of phanerophytes, approaching the spectra of sedimentary caatingas (although with a different flora), whereas the other inselbergs in agreste had intermediate spectra, consistent with their intermediate climate conditions (Fig. 3; Fig. 4; Table 1; Table 2).

Influence of climate variables and space in the community - We found that both spatial factors and climate played a significant role in structuring floristic composition of communities in Caatinga: floristic groups were largely defined by the type of environment (sedimentary, crystalline and inselbergs), but climatic gradients also influenced their composition. This supports the fourth scenario we proposed, i.e, under a general semiarid macroclimate, substrate type is the main factor determining community composition and structure, with climatic gradients influencing composition within each environment type.

In other dry formations, edaphic related factors have been shown to drive important floristic and functional differences on a regional scale (Balvanera & Aguirre 2006; Balvanera *et al.,* 2011; Buck, 1964; Santos *et al.,* 2012). Thus, although climate is recognized as the main factor governing biome distribution on a world scale, communities on a regional scale may be more influenced by substrate differences.

Moreover, crystalline and sedimentary sites showed clearly distinct life-form spectra and these differences were not significantly explained by climate. Thus, we infer that the functional structure of each community is more related to substrate than to climatic gradients. This may be explained by differences in nutrient and water availability in the soil between sedimentary and crystalline areas (*e.g.* Buck, 1964; Balvanera *et al.*, 2011). Inselberg communities showed a more complex pattern, with drier inselbergs more similar to the crystalline caatinga and wetter inselbergs progressively different, apparently following a climatic gradient within this environment type (see also Chapter 3).

Differences in life-form spectra between the Caatinga and other biomes - We found that the Raunkiaer's life-form spectrum of Caatinga is distinct when compared to the main world biomes. Caatinga is subjected annually to a long dry season (Sampaio 1995, Andrade-Lima 1981) and this environmental condition resulted in plant communities with intermediate spectra between wet forests and deserts (Fig. 4). Although different edaphic environments resulted in different spectra on a regional scale (Fig. 3), when these spectra are put in a global context they represent a single group (Fig. 4). This is the first time we are aware that this pattern has been shown in a subcontinental scale for SDTF.

SDTF were defined based on floristic and ecological features (Pennington et al. 2000, 2009, Prado 2000) and now we have also shown that differences to other world biomes also hold for functional characteristics like the life-form spectrum. Moreover, Caatinga was physiognomically different not only from other large South American biomes (Cerrado and Rainforests), but also from all other world biomes we compared. Collation of life-form spectra from other dry formations (in America, Africa, Asia and Oceania) is an interesting further step to test whether the spectra of other semiarid formations are also congruent with those of Caatinga.

ACKNOWLEDGMENTS

We are grateful to Antônio Sérgio F. Castro and Marcelo O. Teles de Menezes for helping us with the classification of Raunkiaer's life-forms of some species. M. F. Moro thanks the Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP – processes 2009/14266-7 and 2011/22498-5) and the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for PhD. grants awarded to him. I. A. Silva thanks the Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) for a post-doc grant awarded to him.

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APPENDIX - Supplementary data

To compare the biological spectrum of inselbergs, crystalline and sedimentary caatingas in the semi-arid northeastern Brazil we compiled papers with floristic and Raunkiaerian life-form data from the literature. We considered only papers that sampled plants of all habits in the sites and attributed a life-form to each species. We found one paper that sampled only woody plants and classified these woody plants in life-forms (Rodal et al. 1998) and one paper that sampled only the herbaceous component and classified it in life-forms (Silva et al. 2009), but we considered only papers sampling indistinctly plants of all habits. One paper (França et al. 2006) brings information on the biological spectrum of an inselberg in Bahia state, but this paper did not inform the life-form of individual species, and so was not included in our analysis. The life-form data available in Araújo et al. (2005) and Lima et al. (2009) was further expanded and republished with more species recently (Araújo et al. 2011), and we considered only the most recent paper in our analysis.

Once the available papers were collected, we built a database with the species and the associated life-forms present in each area. Some authors used life-form categories different from those of Raunkieaer's original classes. We reclassified these "life-forms" to match one of the original Raunkiaer's categories. "Aerophytes", "epiphytes" and "hemiparasites" were considered phanerophytes. The categories "cacti" and "succulent" were reclassified to chamaephytes and phanerophytes, depending on the size of the mature plant. "climbers" and "lianas" were also reclassified. Most reclassified plants reported as lianas and climbers in the Caatinga were actually herbaceous plants and were re-placed in the chamaephyte category, but a few were woody lianas placed among phanerophytes or were tender climbing herbs, placed in the therophytes. A few species were not placed in any category by the original authors (a few epiphytes, climber plants and cacti species), and we attributed them a life-form based on our knowledge and consultation of other botanists acquainted with the Caatinga's flora. Cactus life-forms were determined with the assistance of M. O. Teles de Menezes (personal communication), who has just completed a catalog of cacti in Brazilian Ceará state (Menezes *et al.* 2011). Other plants were determined with assistance of A.S.F. Castro, who has many years of experience collecting plants in the Caatinga.

After this, we built a standardized Raunkiaerian life-form spectrum of each area, considering only the categories Phanerophyte, Chamaephyte, Hemicryptophyte, Cryptophyte and Therophyte. Then, this life-form spectrum was compared with the spectra compiled by Batalha and Martins (2002). We built a matrix of biological spectra of all areas reported by these authors summed with the spectra we compiled ourselves (Table 1) and applied multivariate analysis to search general structural patterns in the Caatinga and major world biomes.

The area "Horto Botânico, Brazil" (Cain *et al.* 1956) is an area of Tropical Rain Forest, but it was incorrectly placed in the original matrix of Batalha and Martins (2002) as temperate forest and we repositioned it among the Rain Forests.

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Table S1. Matrix used in the analysis comparing life-form spectra of the Caatinga (this work) and main world biomes (Batalha & Martins, 2002). The Caatinga's life-form spectra presented here may differ a little from the data informed by original authors because we reclassified some species to match Raunkiaer's original categories. Ph: phanerophyte; Ch: chamaephyte; He: hemicryptophyte; Cr: cryptophyte; Th: therophyte.

Prevailing vegetation type	life-form class (%)					Reference
Site	Ph	Ch	He	Cr	Th	
Crystalline Caatinga						
Crateús, CE, Brazil	28.5	19.0	5.1	1.5	46.0	Araújo et al. (2011)
Quixadá, CE, Brazil	26.3	15.8	12.8	2.3	42.9	Costa et al. (2007)
Floresta/Betânia 1, PE, Brazil	28.7	21.8	12.9	1.0	35.6	Costa el al. (2009)
Floresta/Betânia 2, PE, Brazil	26.1	19.6	15.2	2.2	37.0	Rodal et al. (2005)
Floresta, PE, Brazil	23.4	16.9	16.9	2.6	40.3	Rodal et al. (2005)
Sedimentary Caatinga						
Crateús 1, CE, Brazil	57.4	19.1	3.7	2.9	16.9	Araújo et al. (2011)
Crateús 2, CE, Brazil	58.0	23.2	2.4	3.2	13.2	Araújo et al. (2011)
S. José do Piauí, PI, Brazil	71.3	12.5	8.1	3.7	4.4	Mendes & Castro (2010)
Inselberg in the Caatinga						
Quixadá, CE, Brazil	26.0	14.3	13.0	2.6	44.2	Araújo et al. (2008)
Inselberg in the Agreste						
S. Joaquim do Monte, PE, Brazil	49.4	6.5	4.5	11.7	27.9	Gomes & Alves (2010)
Altinho/Agrestina, PE, Brazil	35.2	5.6	3.2	11.2	44.8	Gomes & Alves (2010)
Esperança, PB, Brazil	39.7	12.7	4.8	0.8	42.1	Porto et al. (2008)
Feira de Santana, BA, Brazil	60.4	18.8	8.3	6.3	6.3	França et al. (2005)
Brazilian Cerrado						
Brasília, Brazil	39.1	13.5	44.9	1.8	0.7	Ratter et al. (1980)
Emas National Park, Brazil	31.6	12.8	49.9	2	3.7	Batalha & Martins (2002)
Lagoa Santa, Brazil	28.8	6.1	55.1	5.4	4.6	Warming (1892)
Mojiguaçu, Brazil	30.9	12.2	47	2.1	7.8	Mantovani (1983)

Pirassununga, Brazil	40.1	17.1	36.1	1.1	5.6	Batalha et al. (1997)
Santa Rita do Passa Quatro, Brazil	45.3	17.2	30	0.8	6.7	Batalha & Mantovani (2001)
Boreal forest						
Terra Nova National Park, Canada	37	12	32	19	0	Charest et al. (2000)
Cold steppe						
Akron, Colorado, USA	0	19	58	8	15	Paulsen (1915) in Cain (1950)
Danube, Southeastern Europe	7	5	55	10	23	Bojko (1934) in Cain (1950)
Pamir Mountain	1	12	63	10	14	Paulsen (1912) in Cain (1950)
Yekasternoslaw, Near East	5	3	55	13	24	Paulsen (1912) in Cain (1950)
Dry temperate forest						
Sinjawi and Duki regions, Pakistan	31.1	10.7	27.7	2.5	27.9	Tareen & Qadir (1993)
Hot desert						
Bir Ghanam, Lybia	0	27.3	9.1	4.5	59.1	Qadir & Shetvy (1986)
Canary Islands	19	19	10	4	47	Børgesen (1924) in Cain (1950)
California, USA	26	7	18	7	42	Raunkiaer (1934)
Eastern Egypt	6.5	29	22	4.2	38.3	El-Ghani (1998)
El Golea, central Sahara	9	13	15	7	56	Raunkiaer (1934)
Gardhaia, north Africa	3	16	20	3	58	Raunkiaer (1934)
Israel	8	16	16	7	52	Danin & Orshan (1990)
Jazan, Saudi Arabia	10.1	31.5	5.6	4.5	48.3	El-Demerdash et al. (1994)
Lybia	12	21	20	5	42	Raunkiaer (1934)
Ooldea, Australia	46	14	4	1	35	Adamson & Osborn (1922) in Cain (1950)
Oudja, Morocco	0	4	17	6	73	Braun-Blanquet & Maire (1924) in Cain (1950)
Transcaspian lowlands	11	7	27	14	41	Paulsen (1912) in Cain (1950)
Zeltin, Lybia	0	14.3	9.5	0	76.2	Qadir & Shetvy (1986)
Hot steppe						
Tucson, USA	18	11	24	0	47	Paulsen (1915) in Cain (1950)

Cyrenaica, north Africa	8	14	19	8	50	Raunkiaer (1934)
Madeira Islands	15	7	24	3	51	Raunkiaer (1934)
Timbuctu, Africa	24	36	9	6	25	Hagerup (1930) in Cain (1950)
Turhoona, Lybia	5.3	25.7	13.2	15.8	42.1	Qadir & Shetvy (1986)
Zwara, Lybia	6.3	46.9	9.4	3.1	34.4	Qadir & Shetvy (1986)
Mediterranean vegetation						
Crete	9	13	27	12	38	Turrill (1929) in Cain (1950)
Ikaria, Greece	7	7	23	14	49	Christodoulakis (1996)
Israel	8	9	23	10	49	Danin & Orshan (1990)
Mount Killini, Greece	10.2	11	41.9	13.1	23.9	Dimopoulus & Georgiadis (1992)
Samos, Greece	9	13	32	13	33	Raunkiaer (1934)
Southern France	7	13	29	8	43	Braun-Blanquet (1925) in Cain (1950)
Prairie						
Konza, USA	11.1	0.9	33.1	24.9	29.9	Stalter et al. (1991)
Rain forest						
Alto do Palmital, Brazil	80	6	11	3	0	Cain et al. (1956)
Caiobá, Brazil	87	7	3	3	0	Cain et al. (1956)
Mucambo, Brazil	95	1	3	1	0	Cain et al. (1956)
Horto Botânico, Brazil	70	4	16	5	5	Cain et al. (1956)
Queensland, USA	96	2	0	2	0	Cromer & Pryor (1942) in Cain (1950)
Savanna						
Barinas, Venezuela	11	3	18	40	28	Sarmiento & Monasterio (1983)
Calabozo, Venezuela	28	7	31	5	29	Aristeguieta (1966) in Sarmiento & Monasterio (1983)
Ghanzi, Botswana	19.9	16.4	28.2	7.6	27.9	Cole & Brown (1976)
Lake Edward, Zaire	5	38	22	5	29	Lebrun (1947) in Sarmiento & Monasterio

						(1983)
Lamto, Ivory Coast	9	1	62	9	19	César (1971) in Sarmiento & Monasterio (1983)
Northern Surinam	8	3	38	28	23	Van Donselaar-Tenbokkel Huinink (1966) in Sarmiento & Monasterio (1983)
Ookemeji, Nigeria	30	0	23	21	25	Hopkins (1962) in Sarmiento & Monasterio (1983)
Southern Kalahari, Africa	13.3	12.2	34.5	7.4	32.7	Cole & Brown (1976)
Southwestern Madagascar	21	18	26	3	32	Morat (1973) in Sarmiento & Monasterio (1983)
Subtropical forest						
Matheran, India	66	17	2	5	10	Bharucha & Ferreira (1941) in Cain (1950)
Temperate Forest						
Alabama, USA	17.6	3.1	47.8	17.1	14.4	Ennis (1928) in Cain (1950)
Alberta, USA	25.8	1.8	48.2	17.1	7.1	Moss (1932) in Cain (1950)
Cape Breton, USA	14.6	1.8	51.3	25.6	6.7	Ennis (1928) in Cain (1950)
North Carolina, USA	59.6	0	36	4.5	0	Buell & Wilbur (1948)
North Carolina, USA	35.9	2.8	44.1	17.2	0	Buell & Wilbur (1948)
China	31.5	2.3	33.9	19.7	12.7	Gao & Chen (1998)
Cincinnati, USA	33.6	3.9	34.4	23.4	3.9	Withrow (1932) in Cain (1950)
Cincinnati, USA	49.9	4.2	23.5	15.9	6.5	Withrow (1932) in Cain (1950)
Connecticut, USA	14.8	2	49.4	20.3	13.5	Ennis (1928) in Cain (1950)
Scotland	13.5	18	53	13	2	Watt (1931) in Cain (1950)
Georgia, USA	23	4	55	10	8	Raunkiaer (1934)

Hondo, Japan	28.9	2	47.4	11.7	10	Horikawa & Sato (1938) in Cain (1950)
Illinois, USA	16.3	1.3	49.7	18.6	14.1	Ewer (1932) in Cain (1950)
Indiana, USA	14.4	1.9	49	18	16.7	McDonald (1937) in Cain (1950)
Iowa, USA	15.3	1	48.6	20.9	14.2	Ennis (1928) in Cain (1950)
Long Island, USA	34.8	10.9	32.6	20.6	1.1	Cain (1936) in Cain (1950)
Michigan, USA	22.8	3.9	47	16.1	10.2	Gates (1930) in Cain (1950)
Minnesota, USA	38.5	4.4	41.8	15.4	0	Buell & Wilbur (1948)
Minnesota, USA	35.2	3.2	45.6	16	0	Buell & Wilbur (1948)
Mississipi, USA	19.5	3.1	49.4	15.2	12.8	Ennis (1928) in Cain (1950)
New York, USA	16.5	5.3	33.3	31.9	13	Taylor (1918) in Cain (1950)
Paris, France	8	6.5	51.5	25	9	Allorge (1922) in Cain (1950)
North Carolina, USA	30	2.1	45	11.1	11.9	Stalter et al. (1991)
Serbia	28.7	11.3	46.2	9.1	4.7	Turrill (1929) in Cain (1950)
Stuttgart, Germany	9	3	54	17	17	Raunkiaer (1934)
Tenesse, USA	19.6	1.7	52.1	15.1	11.5	Cain (1945) in Cain (1950)
Virginia, USA	18.6	1.4	51.7	11.3	17	Allard (1944) in Cain (1950)
Tundra						
Spitzbergen	1	22	60	15	2	Raunkiaer (1934)

Table S2. Number of species in each Raunkiaer's life-form for each area. For the proportion of each life-form in each area consult table 2 in the paper. The number of species in each life-form reported here may differ a little from the original data informed by original authors because we reclassified some species to match Raunkiaer's original categories. Ph: phanerophyte; Ch: chamaephyte; He: hemicryptophyte; Cr: cryptophyte; Th: therophyte.

Site	ph	ch	he	cr	th	Total species number	Reference
Crystalline Caatinga (Crateús, CE)	39	26	7	2	63	137	Araújo et al. (2011)
Crystalline Caatinga (Quixadá, CE)	35	21	17	3	57	133	Costa et al. (2007)
Crystalline Caatinga (Floresta/Betânia 1, PE)	29	22	13	1	36	101	Costa et al. (2009)
Crystalline Caatinga (Floresta/Betânia 2, PE)	24	18	14	2	34	92	Rodal et al. (2005)
Crystalline Caatinga (Floresta, PE)	18	13	13	2	31	77	Rodal et al. (2005)
Sedimentary Caatinga (Crateús 1, CE)	78	26	5	4	23	136	Araújo et al. (2011)
Sedimentary Caatinga (Crateús 2, CE)	145	58	6	8	33	250	Araújo et al. (2011)
Sedimentary Caatinga (S. José do Piauí, PI)	97	17	11	5	6	136	Mendes & Castro (2011)
Inselberg in the Caatinga (Quixadá, CE)	20	11	10	2	34	77	Araújo et al. (2008)
Inselberg in the Agreste (S. Joaquim do Monte, PE)	76	10	7	18	43	154	Gomes & Alves (2010)
Inselberg in the Agreste (Altinho/Agrestina, PE)	44	7	4	14	56	125	Gomes & Alves (2010)
Inselberg in the Agreste (Esperança, PB)	50	16	6	1	53	126	Porto et al. (2008)
Inselberg in the Agreste (Feira de Santana, BA)	29	9	4	3	3	48	Fraça et al. (2005)

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CONCLUSÕES GERAIS DA TESE

Apresentamos aqui uma síntese bibliográfica e biogeográfica para o Domínio Fitogeográfico da Caatinga (DFC) baseado em dados de florística e fitossociologia. É patente que a histórica falta de dados para o DFC tem sido revertida e embora ainda haja grandes lacunas, o quadro é positivo, com um número crescente de artigos sendo publicados ano a ano. Ambientes antes não estudados (como as comunidades aquáticas e as caatingas arbóreas) agora contam com alguns estudos, permitindo uma avaliação mais completa sobre a diversidade do DFC. Nossa síntese biogeográfica explora esse conjunto relativamente recente de dados revelando os padrões gerais de similaridade florística e dicutindo como cada tipo de ambiente se relaciona floristicamente com os demais.

Chamamos atenção para três destaques da tese. O primeiro é o catálogo de espécies, que organiza o conjunto de nomes efetivamente em uso pelos botânicos generalistas no DFC, além de agregar dados ecológicos antes dispersos reportados nesses estudos. O segundo destaque é a realização de comparações biogeográficas que levam em conta a semelhança florística não apenas de árvores e arbustos, mas também do componente não lenhoso, parte fundamental da diversidade da Caatinga. E o terceiro destaque é a primeira síntese e comparação de espectros de formas de vida de Raunkiaer para o DFC, baseando-se em um conjunto bastante recente de dados.

Com isso esperamos ter produzido uma síntese geral que seja útil no entendimento dos padrões e na localização de novas questões a serem abordadas em estudos futuros. Especialmente sugerimos procedimentos metodológicos (usar sempre que possível critérios de inclusão padronizados, evitar pequenos esforços amostrais e amostrar também plantas não lenhosas em florísticas) e indicamos regiões geográficas ainda pouco exploradas botanicamente. Esses dados, se levados em conta por novos estudos, potencialmente maximizarão a utilizadade de novos trabalhos para a comunidade acadêmica, na medida em que permitem direcionar novos esforços justamente para onde há mais carência de dados.