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Original article

Myrtaceae Juss. in restinga of Bahia: diversity, taxonomy, and distribution

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ABSTRACT

Myrtaceae has ca. 6,000 species, distributed into 140 genera with Pantropical distribution. The family is one of the five most representative flowering plants in species richness in Brazilian restinga and is also of great importance for the maintenance of the ecological cycles of this vegetation. However, few studies focus on Myrtaceae in restinga, mainly in the State of Bahia, which has the country's largest coastal extension. This study aims to present the first taxonomic study of Myrtaceae from the restinga of the State of Bahia, Brazil. A total of 10 field trips were performed from September 2016 to April 2019, and the most relevant herbaria of Brazil were consulted. A total of eight genera and 85 species of Myrtaceae were identified in the Bahian restinga. *Myrcia* was the most representative genus with 42 species, followed by *Eugenia* (23 spp.), *Psidium* (seven spp.), *Campomanesia* (five spp.), *Myrciaria* (four spp.), *Neomitranthes* (two spp.), and *Blepharocalyx* and *Calycolpus* (a single species each). Two of them represented new species to science, and four presented the first records to the studied area. The distribution patterns among the Brazilian biomes and the restinga phytophysiognomies are discussed, also a checklist, identification keys, and photographic plates are provided.

Keywords: *Eugenia*, floristic, Mata Atlântica, *Myrcia*, Myrteae.

Introduction

Myrtaceae is the eighth most diverse family of angiosperms worldwide, with 6,000 species distributed into 140 genera (Lucas *et al*. 2012; Govaerts *et al*. 2019) and two diversity centers, Australia and the Neotropics (Wilson *et al*. 2005). The tribe Myrteae comprises nine subtribes, 50 genera, and ca. 2,500 species (Vasconcelos *et al*. 2017b; Lucas *et al*. 2019) and represents all the species diversity within this family in Brazil (Wilson *et al*. 2005; Lucas *et al*. 2007). This tribe is known for its taxonomic complexity due to the megadiverse genera *Myrcia* and *Eugenia* (Landrum & Kawasaki 1997), to its recent diversification age of ca. 32.0 Ma, and mainly to the uniform floral morphology shared by its species (Biffin *et al*. 2010; Vasconcelos *et al*. 2017a; 2018).

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Myrteae is represented by 23 genera and 1,025 species in Brazil and are characterized by opposed leaves with translucid punctuations, white flowers (rarely pink, reddish to purple), petals free, 4-5 (rarely absent), stamens numerous (rarely fewer), ovary inferior, fruit berry with 1 to several seeds, with persistent or deciduous calyx; when the calyx is deciduous, it leaves a scar on the fruit (Landrum & Kawasaki 1997; Wilson *et al*. 2005; Vasconcelos *et al*. 2017a; Proença *et al*. 2020).

Floristic and phytophysiognomic studies in Brazil show that Myrtaceae is one of the five most representative families of flowering plants in abundance and species richness in Brazilian restinga (Araujo & Henriques 1984; Araujo 1992; Pereira *et al*. 2001; Pereira 2003; Sacramento *et al*. 2007; Araujo *et al*. 2009; Vicente *et al*. 2014; Henrique & Araujo 2017). This family is also of great importance for the maintenance of the ecological cycles of this vegetation, being an important food source for local fauna due to producing fruits throughout the year, especially on months with low availability of fleshy fruits produced by other plant families (Staggemeier *et al*. 2017).

Restinga comprises a mosaic of different phytophysiognomies with distinct floristic elements occurring over sandy deposits along the coast, mainly formed by marine regressions and transgressions during the quaternary period (Araujo & Henriques 1984; Araujo 1992). These sandy deposits are affected by the wind and sea-level oscillations, which is reflected in the phytophysiognomy diversity in restinga, including animal and plant richness (Araujo & Pereira 2009). Along the Brazilian coast, restinga discontinuously occurs over the coastal plains from ca. 4° N to 33° S, totalling 7,400 km in extension (IBGE 2004).

Even though Myrtaceae shows great diversity in Brazilian restinga, most of its current studies are restricted to checklists through generalist inventories (Araujo & Henriques 1984; Araujo 1992; Pereira *et al*. 2001; Sacramento *et al*. 2007; Araujo *et al*. 2009; Braz *et al*. 2013; Henrique & Araujo 2017; Guterres *et al*. 2020), with a few studies exclusively focused on Myrtaceae (Rosário *et al*. 2005; Souza *et al*. 2007; Souza & Morim 2008; Lourenço & Barbosa 2012; Giaretta & Peixoto 2015; Lima *et al*. 2015; Amorim & Almeida Jr. 2021). However, none of these studies mentioned above are focused on restinga of Bahia, the Brazilian State with the largest coastal extension. Although the Bahia state represents the largest coastal area in Brazil, Myrtaceae studies has been treated only by general checklists (Britto *et al*. 1993; IBGE 2004; Menezes *et al*. 2009; Gomes & Guedes 2014; Queiroz *et al*. 2017; Costa *et al*. 2018; Silva 2018).

Thus, this study presents the first taxonomic study of Myrtaceae from the restinga of the State of Bahia. A checklist, identification keys, photographic plates, taxonomic, biologic, and distribution comments of the species are presented.

Material and methods

Restinga and its phytophysiognomies in the State of Bahia

Restinga phytophysiognomies are discontinuously found along the coast of the State of Bahia throughout an extension of 1,120 km. Together, these phytophysiognomies form ecosystems associated with the Atlantic Forest biome bordered by mangroves, rivers, and forest patches along the Bahian coast (Martins 2012; Gomes & Guedes 2014; Matos *et al*. 2017). In some municipalities, such as Caravelas, Alcobaça, and Nova Viçosa, the restinga vegetation inhabits up to 20 km of inland coastal plains; in contrast to Itacaré and Ilhéus in which vegetation occupies narrow sand patches (Martin *et al*. 1980).

Restinga classification

To classify the restinga phytophysiognomies, we followed the definitions of Araujo & Pereira (2009), IBGE (2012), and Thomas (2003), and the nomenclature proposed by Dias & Soares (2008), as follows: 1) Non-Flooded restinga Forests (Dry Forests) (DF) (Fig. 1 A): occurring where the groundwater does not superficially surface, the soil is constantly humid during the dry season, and the upper layer comprises 15 to 20 m tall trees; 2) Flooded restinga Forests (FRF): occurring where the groundwater superficially surfaces most of the year, usually during the rainy season, and the upper layer comprises 15 to 20 m tall trees; 3) Shrub Thickets (ST) (Figure 1 B–C): occurring in mosaics of dense thickets, usually comprising different plant species of 4 to 6 m tall shrubs, interposed with open areas of white sand or herbaceous layer; 4) Non-Flooded Dense Shrubs (DS) (Fig. 1 D): showing relatively small shrubs (3 to 5 m tall), within a closed and dense physiognomy, mainly populated by species of Myrtaceae, without any interposed open area or with little herbaceous layer; 5) Flooded Dense Shrub/Herbs (FS) (Fig. 1 E–F): typically occurring in open areas alongside water streams in the coastal plain, surrounding lagoons and lakes where Cyperaceae and Poaceae are dominant; 6) Halophyte/Psammophilous Reptant (HPR): herbaceous and subshrub formations, rhizomatous and reptant, mostly occurring alongside the coastal line influenced by higher tides.

Phytophysiognomies identification occurred during field trips and by verifying the locality information on the labels from all analyzed specimens. Since most collectors used different classifications to name restinga phytophysiognomies over time, it was imperative to standardize all names that were grouped into the six phytophysiognomies: 1) DF, including the terms "forest of restinga" and "arboreal restinga"; 2) FRF, including "tall restinga with marshes" and "flooded restinga" (not observed during fieldwork, but recorded from the vast

literature (Matos 2014; Thomas 2003; Dias & Soares 2008) and herborized specimens; 3) ST, including "open restinga", "restinga patches", "thickets and shrubs over dunes", "shrubby dunes", "herbaceous shrubby restinga", and "low restinga"; 4) DS, including "shrubby-arboreal restinga" and "dense shrubby restinga"; and 5) FS, including "shrubby restinga with marshes", "thickets and flooded herbaceous restinga", and "flooded thicket restinga". 6) HPR, which had no evidence of Myrtaceae neither described in the literature nor on herborized or during field trips. Finally, for specimens with only the word "restinga" recorded as the phytophysiognomy of occurrence, we classified them as non-identifiable phytophysiognomy (NI). Additionally, we named "anthropized restinga" (AR) when the labels of the specimens indicated the terms "altered", "anthropized", "degraded", and "disturbed" restinga (see species distribution presented in Table 1).

Figure 1. Phytophysiognomies of restinga vegetation of the State of Bahia. A. Non-Flooded Restinga Forests (Dry Forests) in Maraú. B–C. Shrub Thickets; B: Municipality of Conde; C: Municipality of Mata de São João. D. Non-Flooded Dense Shrubs in Mata de São João. E–F. Flooded Dense Shrub/Herbs; E: Lagoa Jauara in Mata de São João; F: Municipality of Camaçari (A–F: J.D.O. Melo).

Table 1. List of Myrtaceae from the restingas of the State of Bahia; ■ Endemic to Bahia; ● Endemic to Atlantic Forest domain; ▲ Endemic to restinga vegetation; Phytophysiognomies: DF: Non-Flooded Restinga Forests or Dry Forests, DS: Non-Flooded Dense Shrubs, FRF: Flooded Restinga Forests, FS: Flooded Dense Shrub/Herbs, ST: Shrub Thickets, NI: Not identified phytophysiognomy, AR: anthropized restinga.

Genus/Species	Voucher	Phytophysiognomy
***Blepharocalyx* O.Berg (1 sp.)**		
Blepharocalyx eggersii (Kiaersk.) Landrum	A.M. de Carvalho *et al.* 3119	DF; ST
***Calycolpus* O.Berg (1 sp.)**		
Calycolpus legrandii Mattos ●	J.D.O. Melo *et al.* 29	DF; DS; ST
***Campomanesia* Ruiz & Pav. (5 spp.)**		
Campomanesia aromatica (Aubl.) Griseb.	M.L. Guedes *et al.* 766	DS; ST
Campomanesia dichotoma (O.Berg) Mattos	J.D.O. Melo *et al.* 42	AR; DS; DF
Campomanesia guaviroba (DC.) Kiaersk.	A.M. de Carvalho *et al.* 851	DF
Campomanesia guazumifolia (Cambess.) O.Berg	D.A. Folli 1941	NI
Campomanesia ilhoensis Mattos	M.L. Guedes *et al.* 21583	DF
***Eugenia* L. (23 spp.)**		
Eugenia astringens Cambess. ●	J.D.O. Melo *et al.* 129	DF; DS; FS; ST
Eugenia ayacuchae Steyerm. ●	F.S. Gomes *et al.* 874	DF; DS
Eugenia bahiensis DC. ●	R.M. Harley *et al.* 18480	DF; DS
Eugenia brasiliensis Lam. ●	L.A. Mattos-Silva *et al.* 1793	DF
Eugenia candolleana DC.	M.L. Guedes *et al.* 23425	DF; ST
Eugenia costatifructa Mazine	J. Arouck *et al.* 222	DF
Eugenia dichroma O.Berg ●	G. Hatschbach *et al.* 47066	AR; DF
Eugenia excelsa O.Berg	H.P. Bautista *et al.* 4027	DF
Eugenia florida DC.	A.L.M. Brasil 01	DF
Eugenia guanabarina (Mattos & D.Legrand) Giaretta & M.C.Souza ●	A.P. Duarte 6066	DF
Eugenia hirta O.Berg	J.D.O. Melo 09	AR; DF; DS
Eugenia itacarensis Mattos ■ ●	A. Giaretta *et al.* 1650	DF
Eugenia itapemirimensis Cambess.	J.G. Jardim *et al.* 2665	DF
Eugenia lacistema Sobral ■ ●	J.D.O. Melo *et al.* 49	DF
Eugenia ligustrina (Sw.) Willd.	W.W. Thomas *et al.* 9970	DS
Eugenia melanogyna (D.Legrand) Sobral ●	E.N. Matos *et al.* 3488	DF
Eugenia platyphylla O.Berg ●	W.W. Thomas *et al.* 11035	DF; DS
Eugenia pruniformis Cambess.	J.G. Carvalho-Sobrinho *et al.* 784	DF
Eugenia punicifolia (Kunth) DC.	M.L. Guedes *et al.* 6262	AR; DF; ST
Eugenia schottiana O.Berg	A. Amorim *et al.* 493	DF
Eugenia unana Sobral ■ ●	S.A. Mori *et al.* 13261	DF
Eugenia uniflora L.	L.A. Mattos-Silva *et al.* 4173	AR; DF; ST
Eugenia sp. ■ ●	D.L. Santana *et al.* 353	DS; ST
***Myrcia* DC. (42 spp.)**		
Myrcia arenaria L.L.Santos, M.F.Sales & Sobral	M. Sobral *et al.* 8428	DF
Myrcia bergiana O.Berg	J.D.O. Melo *et al.* 27	DF; DS; ST
Myrcia bicolor Kiaersk. ●	S.C. Sant'Ana *et al.* 337	DF
Myrcia decorticans DC.	J.D.O. Melo *et al.* 71	AR; DF; ST
Myrcia densa (DC.) Sobral	M.L. Guedes *et al.* 8219	ST
Myrcia excoriata (Mart.) E.Lucas & C.E.Wilson ●	E.P. Queiroz *et al.* 468	DF
Myrcia felisbertii (DC.) O.Berg ●	A.P. Duarte 6035	NI
Myrcia guedesiae J.D.O.Melo & Stadnik ■ ● ▲	M.L. Guedes *et al.* 23025	DF
Myrcia grazielae NicLugh. ●	W.W. Thomas *et al.* 10001	FRF
Myrcia guianensis (Aubl.) DC.	J.D.O. Melo *et al.* 125	AR; DF; DS

Table 1. Cont.

Genus/Species	Voucher	Phytophysiognomy
Myrcia hirtiflora DC. ■ ●	J.D.O. Melo *et al.* 23	DF
Myrcia hypophaea Sobral ●	D. Cardoso *et al.* 2334	DF
Myrcia ilheosensis Kiaersk. ●	M.L. Guedes *et al.* 11226	AR; DF; ST
Myrcia insularis Gardner ●	J.G. Jardim *et al.* 215	DF
Myrcia isaiana G.M.Barroso & Peixoto ●	L. Daneu *et al.* 348	NI
Myrcia littoralis DC. ●	E.J. Lucas *et al.* 1000	DF; DS
Myrcia loranthifolia (DC.) G.P.Burton & E.Lucas	M.L. Guedes *et al.* 5483	AR; DF; ST
Myrcia marianae Stagg. & E.Lucas ■ ● ▲	V.G. Staggemeier *et al.* 764	DF
Myrcia multiflora (Lam.) DC.	L.A. Mattos-Silva *et al.* 4205	DF
Myrcia multipunctata Mazine	E. Matos *et al.* 1202	DF
Myrcia neoregeliana E.Lucas & C.E.Wilson	M.L. Guedes *et al.* 8215	ST
Myrcia neoverticillaris E.Lucas & C.E.Wilson●	S.C. Sant'Ana *et al.* 325	DF
Myrcia neuwiedeana (O.Berg) E.Lucas & C.E.Wilson ●	G. Hatschbach *et al.* 53479	DF; FS; ST
Myrcia obversa (D.Legrand) E.Lucas & C.E.Wilson ●	L.A. Mattos-Silva *et al.* 4566	DF
Myrcia perforata O.Berg	A.M. de Carvalho *et al.* 6509	DS
Myrcia polyantha DC.	J.D.O. Melo *et al.* 73	DF; DS
Myrcia polygama (O.Berg) M.F.Santos ●	H.M. Dias *et al.* 292	AR
Myrcia racemosa (O.Berg) Kiaersk.	R.M. Harley *et al.* 17079	DF; DS
Myrcia raminfinita L.Marinho & E.Lucas ■ ● ▲	L.C. Marinho *et al.* 1186	DF
Myrcia ramuliflora (O.Berg) N.Silveira ● ▲	J.D.O. Melo *et al.* 28	AR; ST
Myrcia restingae (Sobral) A.R.Lourenço & E.Lucas ● ▲	E.J. Lucas *et al.* 990	DF; ST
Myrcia rosangelae NicLugh. ●	F. França 3223	DF; DS
Myrcia salzmannii O.Berg ●	J.D.O. Melo *et al.* 132	AR; DF; ST
Myrcia spathulifolia Proença ●	J.D.O. Melo *et al.* 120	DF; DS; ST
Myrcia splendens (Sw.) DC.	M.L. Guedes 30354	AR; DF; DS; FS; ST
Myrcia sylvatica (G.Mey.) DC.	M. Ibrahim *et al.* 112	DF; DS
Myrcia tetraphylla Sobral ■ ●	J.G. Jardim *et al.* 265	DF
Myrcia thyrsoidea O.Berg ●	E.J. Lucas *et al.* 1095	AR; DF
Myrcia tomentosa (Aubl.) DC.	F.S. Gomes *et al.* 1233	AR; DF
Myrcia vellozoi Mazine ●	W.W. Thomas *et al.* 9040	DF
Myrcia vittoriana Kiaersk. ●	J.D.O. Melo *et al.* 137	AR; DF; DS; FRF
Myrcia sp. ● ▲	J.D.O. Melo *et al.* 19	DF; ST
***Myrciaria* O.Berg (4 spp.)**		
Myrciaria floribunda (H.West ex Willd.) O.Berg	J.D.O. Melo *et al.* 25	DF; DS; ST
Myrciaria glomerata O.Berg	W.W. Thomas *et al.* 9991	FRF
Myrciaria pilosa Sobral & Couto	D. Cardoso *et al.* 2035	DF
Myrciaria strigipes O.Berg ●	G. Hatschbach *et al.* 49454	AR; DS
***Neomitranthes* D.Legrand (2 spp.)**		
Neomitranthes obscura (DC.) N.Silveira ●	A.M. de Carvalho *et al.* 816	DF
Neomitranthes obtusa Sobral & Zambom ●	J.G. Jardim *et al.* 233	DF; DS
***Psidium* L. (7 spp.)**		
Psidium amplexicaule Pers. ● ▲	H.P. Bautista *et al.* 1578	ST
Psidium bahianum Landrum & Funch ■ ●	M.R. Fonseca *et al.* 88	AR; DF
Psidium brownianum Mart. ex DC.	M.L. Guedes *et al.* 10695	NI
Psidium cattleyanum Sabine	T.S. Nunes *et al.* 1352	DF; ST
Psidium guajava L.	E.M. Costa-Neto 42	AR
Psidium guineense Sw.	J.D.O. Melo *et al.* 141	DF; DS
Psidium oligospermum Mart. ex DC.	J.D.O. Melo *et al.* 30	AR; DF; DS; ST

Taxonomy

A total of 10 field trips, lasting from three to seven days each, were performed in seven municipalities of the State of Bahia (Conde, Ilhéus, Itacaré, Ituberá, Maraú, Mata de São João, and Una) from September 2016 to April 2019 (Fig. 2). Specimen collections were made following usual methods (Peixoto & Maia 2013) during walks in all different restinga phytophysiognomies. All specimens were processed, dried, and included in the Alexandre Leal Costa Herbarium (ALCB), with duplicates sent to the Universidade Estadual de Feira de Santana Herbarium (HUEFS). For taxa identification, we consulted specialized literature, besides analyzing type specimens, e-types, and their protologues.

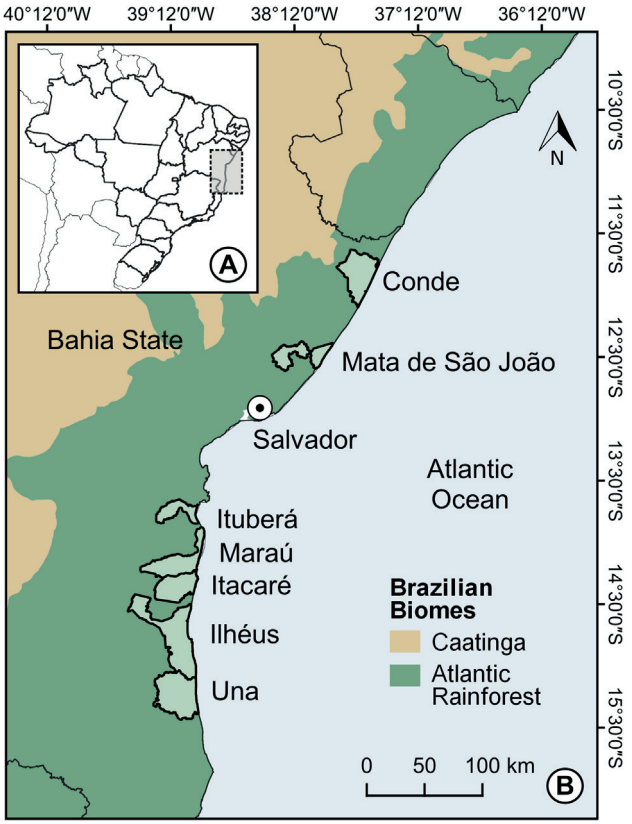

Figure 2. A. Brazilian map. B. Coast of Bahia state; the highlighted municipalities are those sampled by collections.

The most relevant herbaria of Brazil for restinga vegetation and Myrtaceae were consulted for the elaboration of the checklist (ALCB, CEPEC, HRB, HUEFS, HURB, MBM, RB, and SPF, acronyms following Thiers 2020). The description of vegetative characters and indument types followed Radford *et al.* (1974) and Beentje (2016), while inflorescence architecture followed Briggs & Johnson (1979). Specific morphological terminology for Myrtaceae followed Landrum & Kawasaki (1997) and Lucas *et al.* (2019). The morphological features of racemes in *Eugenia* species were described according to Mazine (2006) and Mazine *et al.* (2014). Measurements were taken from dried specimens and are presented as length x width. Species distribution was obtained from specimen labels, protologues, and online databases such as Flora e Funga do Brasil 2020, GBif (https://www.gbif.org/) and SpeciesLink (https://specieslink.net). The distribution map was generated on QGIS (QGIS Development Team 2022).

Results and discussion

Diversity of Myrtaceae in restinga of the State of Bahia

A total of eight genera and 85 species of Myrtaceae were identified in the restinga of Bahia, with ten of them endemic to this State, 45 species endemics to the Atlantic Forest biome, and six species endemics to restinga vegetation (Table 1). *Myrcia* was the most representative genus with 42 species, followed by *Eugenia* (23 spp.), *Psidium* (seven spp.), *Campomanesia* (five spp.), *Myrciaria* (four spp.), *Neomitranthes* (two spp.), and *Blepharocalyx* and *Calycolpus* (a single species each). Two species (*Eugenia* sp. and *Myrcia* sp.) are new for science and are being prepared for publication (Faria *et al*. unpubl. res.; Melo *et al*. unpubl. res.).

This study presents the first records of four species in Bahian restinga: *Eugenia melanogyna*, previously recorded for Southeast and Southern Brazil; *Myrcia bicolor*, before cited to rainforests of the State of Bahia and Southeast Brazil (Santos *et al*. 2018); and *Campomanesia aromatica* and *Myrciaria pilosa*, mentioned to the Caatinga biome and semideciduous dry forests, respectively (Oliveira *et al*. 2012; Proença *et al*. 2020).

Distribution patterns

Four distribution patterns were identified within the Myrtaceae from restinga of Bahia state (Fig. 3): 49 species (58%) are endemic of the Atlantic Forest biome (AF); 17 species (19%) occur widely distributed in Brazil (WID); 16 species (19%) occur in the Atlantic Forest biome and Central Brazil, besides the Caatinga and Cerrado biomes (ACC); and three species (4%) occur disjunct between the Atlantic and Amazon Forests (AAM).

Previous floristic studies evidenced that restinga phytophysiognomies are colonized by plants from their surrounding biomes, such as the Atlantic Forest, Caatinga, Cerrado, and even the Amazon Forest. It reflects the species occurring among these Biomes and the low endemism rate found in restinga (Scarano 2002; Castro *et al*. 2012; Fernandes & Queiroz 2015), corroborating our results (only six species). Of all species here classified as ACC, five of them only occur in the Atlantic Forest and Caatinga (*Campomanesia ilhoensis*, *Eugenia schottiana*, *Myrcia arenaria*, *M. bergiana*, and *Myrciaria pilosa*), two only occur in the Atlantic Forest and Cerrado (*M. ilheosensis* and *M. racemosa*), and nine occur in the Atlantic Forest, Caatinga and Cerrado (*C. dichotoma*, *M. densa*, *M. multipunctata*, *M. loranthifolia*,

M. neoregeliana, *M. polyantha*, *Psidium brownianum*, *P. cattleyanum*, and *P. oligospermum*). This pattern is probably related to the geographical proximity of the Bahian restinga to the Caatinga biome instead of the Cerrado Biome (Fig. 2).

Most species of Myrtaceae found in restinga of Bahia are endemic to the Atlantic Forest, similar to previous studies (Assis *et al*. 2004). This pattern is expected since most of the Brazilian restinga is associated with and heavily influenced by this biome (Cerqueira 2000).

The Atlantic Forest biome comprises more than half of the species of Myrtaceae from Brazil (692 spp. or 58%, Proença *et al*. 2020), and recent Myrteae biogeographical reviews showed that the Atlantic Forest is the most likely ancestral area of the biggest genera, *Myrcia* and *Eugenia*, reflecting the great diversity of Myrtaceae in the Atlantic Forest (Santos *et al*. 2017; Mazine *et al*. 2018; Amorim *et al*. 2019). According to these recent studies, the main Myrteae lineages originated in the Atlantic Forest and later colonized the Amazon basin, Caatinga, Cerrado, Caribbean, and the Andes, which could explain species occurring among these biomes. For instance, *Blepharocalyx eggersii*, *Eugenia excelsa* and *Myrciaria glomerata* are disjunct distributed between the Atlantic and Amazon Forests.

A total of 26 species of Myrtaceae from the restinga of Bahia also occur in the Espinhaço mountain range in several habitats (Campo Rupestre, Forests, Caatinga s.l., and Cerrado s.l.). This disjunction pattern has been recently recorded in the literature for other angiosperms groups (Alves *et al*. 2007; Lucresia *et al*. unpubl. res.).

Eugenia punicifolia, Myrcia guianensis, *M. splendens*, *M. tomentosa*, *Myrciaria floribunda*, and *Psidium guajava* are widely distributed (WID) and occur in all Brazilian biomes, from humid to dry vegetation, bearing remarkable morphological plasticity in leaf size, texture, and indument.

Diversity of Myrtaceae among different restinga phytophysiognomies

Analyzing species distribution of Myrtaceae among restinga phytophysiognomies in the State of Bahia we could see that 68 species (45% of the total) are found in DF, with 31 species exclusive of this phytophysiognomy (Fig. 4). This result shows the importance of Myrtaceae for forested physiognomies within restinga dry forests (Assumpção & Nascimento 2000; Matos 2014).

The DS phytophysiognomy registered 26 species (17%), with two (*Eugenia ligustrina* and *Myrcia luschnathiana*) restricted to it. ST phytophysiognomy recorded 25 species (17%), with *Myrcia densa*, *M. neoregeliana*, and *Psidium amplexicaule* occurring exclusively in Lagoas e Dunas do Abaeté Environmental Protection Area, which has one of the richest phanerogamic flora of dunes in Brazil (Britto *et al*. 1993).

Only six species were recorded in flooded restinga; four in the FRF phytophysiognomy, being *Myrcia grazielae* and *Myrciaria glomerata* restrict to it, and three species in the FS phytophysiognomy (*Eugenia astringens*, *Myrcia neuwiedeana* and *M. splendens*), with no exclusive species recorded. The low number of species occurring in flooded phytophysiognomies was also reported by Matos (2014), that showed soil flooding is a limiting factor for establishing species of Myrtaceae.

We have also noticed that some species of Myrtaceae occur in different portions of the Bahian restinga: 11 species (13%) are found in Northern restinga (above the municipality of Salvador), and 37 species (43%) only occur in southern restinga (below the municipality of Salvador) in the State of Bahia. Martin *et al*. (1980) and Matos (2014) pointed out that the floristic heterogeneity of northern and southern restinga in the State of Bahia might reflect

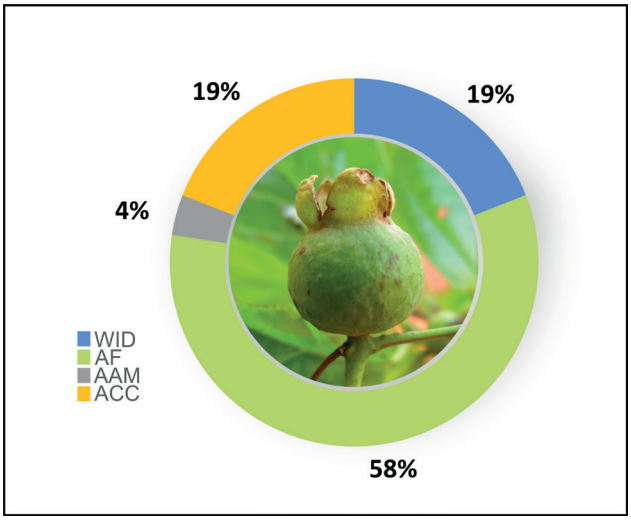

Figure 3. Distribution pattern of Myrtaceae species found in restinga in the state of Bahia: WID – widely distributed in Brazil; AF – endemic of the Atlantic Forest biome; AAM – disjunction between the Atlantic and Amazon Forests; ACC – Atlantic Forest, Caatinga and Cerrado biomes.

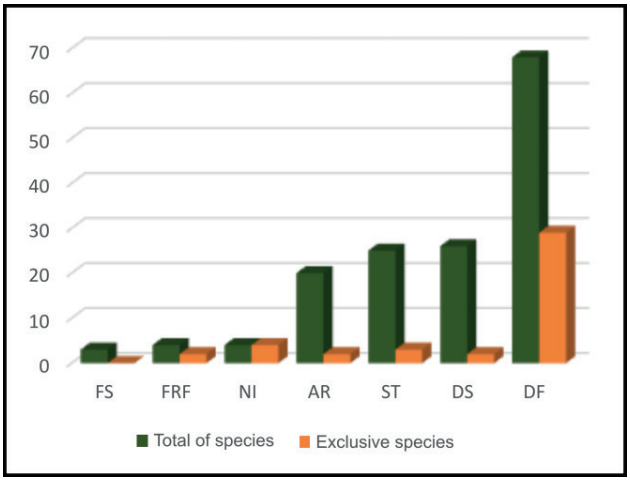

Figure 4. Number of Myrtaceae species at each restinga phytophysiognomy in the state of Bahia (green - total of species; orange - exclusive species): AR: anthropized restinga; DF: Non-Flooded Restinga Forests or Dry Forests; DS: Non-Flooded Dense Shrubs; FRF: Flooded Restinga Forests; FS: Flooded Dense Shrub/Herbs; ST: Shrub Thickets; NI: Not identified phytophysiognomy.

climatic differences and the influence of different vegetation types. The northern Bahian coast is surrounded mainly by the Caatinga biome that presents a semiarid climate (Matos 2014; Matos *et al*. 2017), while the remaining coastal areas are not markedly dry (Martin *et al*. 1980; Cerqueira 2000) and is surrounded by the Atlantic Forest biome with great diversity and endemisms (Mori *et al*. 1981; 1983; Thomas *et al*. 1998; Amorim *et al*. 2005; Matos 2014).

Key of Myrtaceae genera from restinga of Bahia (Fig. 5)

1. Inflorescence panicle or thyrsoid 2
1. Inflorescence in glomerule, fascicle, raceme, corymb, dichasium or solitary flowers 3
2. Stamens curved in the bud, ovary with 2 ovules per locule, embryo with two free, foliaceous cotyledons ..... *Myrcia*
2. Stamens straight in the bud, ovary with 3–5 ovules per locule, embryo with cotyledons and hypocotyl-radicle axis fused and homogenous ..... *Eugenia guanabarina*
3. Flowers with 2 calyx lobes, free, opening regularly, circular staminal ring ..... *Blepharocalyx eggersii*
3. Flowers with 4–5 calyx lobes, free or fused, tearing or opening via calyptra when fused, angular staminal ring 4
4. Hypanthium prolonged above the ovary summit, a thin staminal ring (<30% of the floral disc) 5
4. Hypanthium flat, thick staminal ring (>30% of the floral disc) 7
5. Solitary flowers, calyx lobes persistent after anthesis, embryo with two foliaceous cotyledons ..... *Myrcia marianae*
5. Inflorescence in raceme or glomerule, calyx lobes deciduous after anthesis, embryo with cotyledons and hypocotyl-radicle axis homogenous 6
6. Calyx lobes fused in the bud, with an apiculum opening via calyptra ..... *Neomitranthes*
6. Four calyx lobes free in the bud, opening regularly ..... *Myrciaria*
7. Floral bud with 4 free and regular calyx lobes, stigma terete, embryo with cotyledons and hypocotyl-radicle axis fused and homogenous ..... *Eugenia*
7. Floral bud usually with 5 free calyx lobes, or fused opening irregularly in anthesis, stigma capitate, embryo C–shaped or spiraled 8
8. Calyx lobes and bracteoles foliaceous ..... *Calycolpus legrandii*
8. Calyx lobes and bracteoles not foliaceous 9
9. Placenta intrusive in the locule, locule walls not glandular, locules distributed throughout the fruit, not oriented in a ring; bony seed coat ..... *Psidium*
9. Placenta not intrusive in the locule, locule walls glandular, functioning as a false seed coat (Fig. 5 F), locules arranged in a ring in the fruit; membranaceous seed coats ..... *Campomanesia*

Key to the species of ***Campomanesia*** *from restinga of Bahia (Fig. 5)*

1. Inflorescence in dichasium 2
1. Solitary flowers 3
2. Peduncle 1.0–1.7 cm long; calyx lobes free in the bud; fruits surface muricate ..... *C. ilhoensis*
2. Peduncle 2.2–6.4 cm long; calyx lobes fused in the bud; fruits surface smooth ..... *C. dichotoma*
3. Leaf blade 3.5–5.3 cm long, glabrous on both faces; pedicel 14.6–22.3 mm long ..... *C. aromatica*
3. Leaf blade 6–10 cm long, pubescent on abaxial face; pedicel 1–3 mm long 4
4. Branches, leaves, and flowers with ochreous indumentum; domatia in the axils of the leaf veins on the abaxial surface; calyx lobes free in the bud ..... *C. guaviroba*
4. Branches, leaves, and flowers with white indumentum; domatia absent; calyx lobes fused in the bud ..... *C. guazumifolia*

Figure 5. A–B. *Blepharocalyx eggersii*; A: fruits with two calyx lobes; B: compound dichasium. C–D. *Calycolpus legrandii*; C: ripe fruits with bracteoles and calyx lobes foliaceous and persistent; D: immature fruits with bracteoles and calyx lobes foliaceous and persistent. E–F. *Campomanesia dichotoma*; E: dichasium with immature fruits; F: cross section of the fruit showing the glandular walls of the locules (detailed) (A–F: J.D.O. Melo).

Key to the species of ***Eugenia*** *from restinga of Bahia (Fig. 6)*

1. Inflorescence thyrsoid; calyx lobes fused in the bud ..... *E. guanabarina*
1. Inflorescence in raceme, dichasium, glomerule or fascicle; calyx lobes free in the bud 2
2. Bracteoles and calyx lobes foliaceous and showy (13.2–16.5 mm long) ..... *E. itacarensis*
2. Bracteoles and calyx lobes not foliaceous and not showy (1–5 mm long) 3
3. Inflorescence in raceme or dichasium 4
3. Inflorescence in fascicle or glomerule 13
4. Inflorescence in dichasium; locule walls densely pilose in the ovary ..... *Eugenia* sp.
4. Inflorescence in raceme; locule walls glabrous in the ovary 5
5. Inflorescence in raceme (with a terminate vegetative bud); bracteoles persistent after anthesis 6
5. Inflorescence in raceme auxothelic (vegetative branch keep growing at the apex, beyond the flowering region); bracteoles deciduous after anthesis 10
6. Raceme corymbiform 7
6. Raceme not corymbiform 8
7. Inflorescence with ferrugineous indumentum ..... *E. pruniformis*
7. Inflorescence with ochreous indumentum ..... *E. candolleana*
8. Hypanthium and fruits costate ..... *E. costatifructa*
8. Hypanthium and fruits smooth 9
9. Leaf blade elliptic, apex acute; hypanthium glabrous ..... *E. florida*
9. Leaf blade obovate, apex obtuse; hypanthium densely pubescent ..... *E. schottiana*
10. Hypanthium and fruits costate ..... *E. uniflora*
10. Hypanthium and fruits smooth 11
11. Leaf blade obovate; cataphylls obovate, conspicuous (4.8–12 mm long) 12
11. Leaf blade elliptic; cataphylls ovate, inconspicuous (ca. 1 mm long) ..... *E. dichroma*
12. Leaf blade 2.8–4.8 × 1.1–2.3 cm, short petioles (2–4 mm long); cataphylls 4–8 mm long ..... *E. ligustrina*
12. Leaf blade 7.8–8.6 × 2.8–3.8 cm, long petioles (7–15 mm long); cataphylls 10–12 mm long ..... *E. brasiliensis*
13. Bracteoles persistent at fruit; style twice the length of the stamens 14
13. Bracteoles deciduous; style approximately the same length as the stamens 22
14. Leaf blade 7–26.5 cm long 15
14. Leaf blade 1.8–6 cm long 20
15. Flowers sessile (pedicel 0.1–1 mm long) ..... *E. ayacuchae*
15. Flowers pedicellate (pedicel 2–14 mm long) 16
16. Leaf blade with rounded apex ..... *E. unana*
16. Leaf blade with acute or acuminate apex 17
17. Bracteoles conspicuous (2–3.5 mm long), with a fused base, partially surrounding the ovary ..... *E. itapemirimensis*
17. Bracteoles inconspicuous (0.3–2 mm long), free and not surrounding the ovary 18
18. Inflorescence main axis with lignified bracts (Fig. 6 E), persistent and congest along the axis ..... *E. lacistema*
18. Inflorescence axis with bracts not lignified, deciduous, and lax along the axis. 19

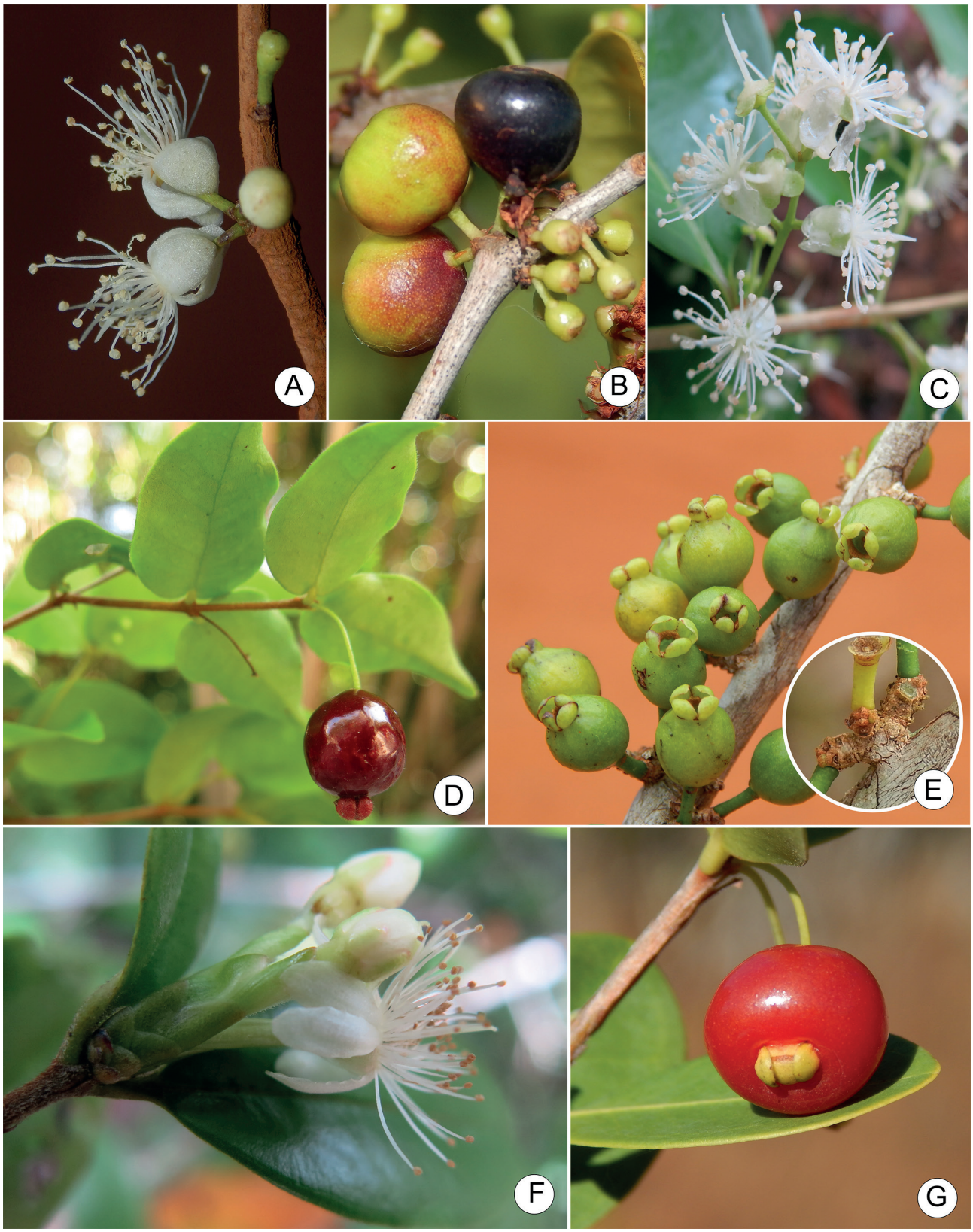

Figure 6. A–B. *Eugenia astringens*; A: Flowers bud and flowers; B: immature (green to yellow) and ripe fruits (dark purple to blackish). C. *E. candolleana*: inflorescence in raceme. D. *E. hirta*: ripe fruit. E. *E. lacistema*: infrutescence axis with lignified bracts (detailed) and young green fruits. F. *E. ligustrina*: raceme auxothelic. G. *E. punicifolia*: ripe fruit (A, B, D, E, G. J.D.O. Melo; C, F. A. Stadnik).

19. Flowers, pedicels, and fruits with indumentum velutinous ..... *E. bahiensis*

19. Flowers, pedicels, and fruits glabrous ..... *E. melanogyna*

20. Leaf blade with apex acute or acuminate; calyx lobes 1–3 mm long; red ripe fruit 21

20. Leaf blade with apex rounded; calyx lobes 0.4–1 mm long; dark purple to black ripe fruit ..... *E. astringens*

21. Plants with hirsute indumentum; leaves sessile or subsessile (petiole 0.3–1.6 mm long), blade ovate, base cordate ... . *E. hirta*

21. Plants glabrous; leaves petiolate (petiole 2–5 mm long), blade elliptic or lanceolate, base attenuate ..... *E. punicifolia*

22. Petioles 2–4 mm long, leaf blade with apex cuspidate; inflorescence axis 2–3 mm long ..... *E. excelsa*

22. Petioles 6–10 mm long, leaf blade with apex acute; inflorescence axis 1–2 mm long ..... *E. platyphylla*

Key to the species of ***Myrcia*** *from restinga of Bahia (Figs. 7 and 8)*

1. Branches with sympodial growth 2

1. Branches with monopodial growth 4

2. Leaf blade with apex caudate; calyx lobes free in the floral bud ..... *M. bicolor*

2. Leaf blade with apex acute or acuminate; calyx lobes completely fused in the floral but, tearing as a calyptra at anthesis 3

3. leaf blade elliptic, matte adaxially (herborized); floral bud obovoid, calyptra convex ..... *M. loranthifolia*

3. Leaf blade ovate, glossy adaxially (herborized); floral bud fusiform, calyptra conical ..... *M. restingae*

4. Floral disc densely covered by trichomes; hypanthium flat 5

4. Floral disc glabrous or few trichomes on style base; hypanthium extended above the ovary 15

5. Staminal ring thin (<30% of floral disc); anthers with pollen sac positioned unevenly, and irregular dehiscence 6

5. Staminal ring thick (>60% of floral disc); anthers with pollen sacs positioned at the same level, and regular dehiscence (longitudinal) 9

6. Leaf blade bullate adaxially, abaxial side puberulous or tomentose ..... *M. grazielae*

6. Leaf blade smooth adaxially; abaxial side strigose, mainly in young leaves 7

7. Sessile or subsessile leaf (petiole 0–2 mm long.) ..... *M. rosangelae*

7. Petiolate leaf (petiole 3–6 mm long.) 8

8. Leaf blade 2–9 × 1.2–5 cm long; leaf blade with apex rounded or retuse; calyx lobes acute; fruit globose .... *M. ilheosensis*

8. Leaf blade 11.7–21.5 × 4.4–8.2 cm long; leaf blade with apex acute or acuminate; calyx lobes rounded; fruit conical ... . *M. vittoriana*

9. Plants with ferruginous indumentum 10

9. Plants with white, cream, or amber indumentum 12

10. Leaf blade 16–18 cm long; 20–24 pairs of secondary veins; fruit ellipsoid ..... *M. perforata*

10. leaf blade 8–15 cm long; 8–20 pairs of secondary veins; fruit globose 11

11. Leaf blade smooth, 15–20 pairs of secondary veins, inconspicuous in both sides, abaxial side totally covered by trichomes (mature leaf); calyx lobes deltate, ca. 1 mm long ..... *M. bergiana*

11. Leaf blade bullate, 8–12 pairs of secondary veins, conspicuous protruding abaxially and sulcate adaxially, abaxial side with trichomes just along the main vein (mature leaf); calyx lobes rounded, ca. 2 mm long ..... *M. isaiana*

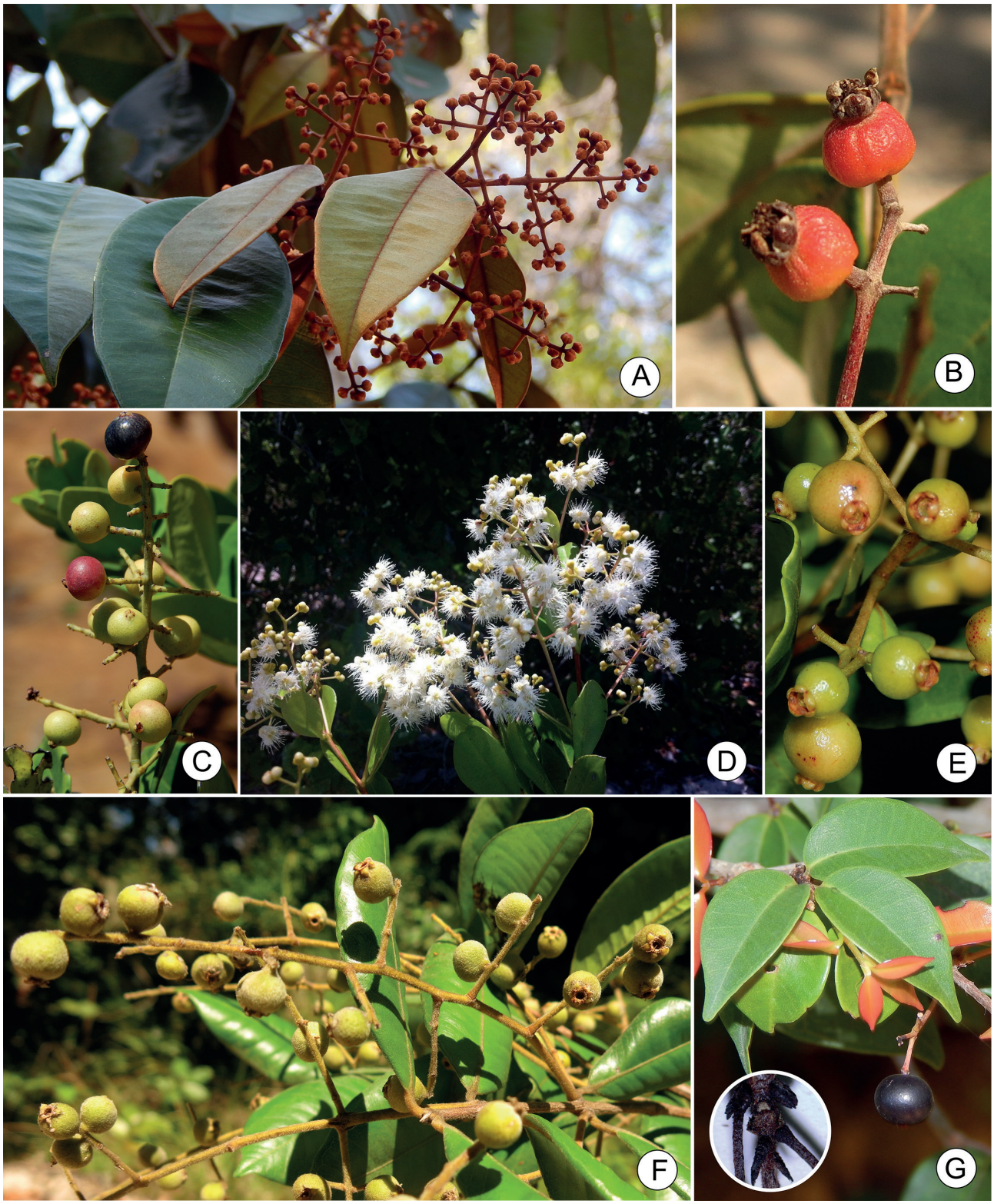

Figure 7. A–B. *Myrcia bergiana*; A: leaves and inflorescence; B: ripe fruits. C. *M. decorticans*: inflorescence with immature (green and red) and ripe fruits (dark purple to blackish). D–E. *M. guianensis*; D: inflorescence; E: ripe fruits. F. *M. hirtiflora*; infrutescence with immature fruits. G. *M. polyantha*: branch with young red leaves and infrutescence with ripe fruit (bracteate branch detailed) (A–G: J.D.O. Melo).

12. Leaf blade with apex rounded or retuse, glabrous or sparsely pubescent; hypanthium glabrescent on external side . ..... *M. thyrsoidea*

12. Leaf blade with apex acute or acuminate, tomentose or densely pubescent; hypanthium with persistent indument on external side 13

13. Leaf blade with main vein flat adaxially, secondary veins protruding abaxially; floral bud 3 × 2–3 mm; hypanthium with ocherous indumentum ..... *M. splendens*

13. Leaf blade with main vein sulcate adaxially, secondary veins inconspicuous and flat abaxially; floral buds ca. 2 × 2 mm; hypanthium with white indumentum 14

14. Leaf blade with base cordate, margin revolute; fruit globose ..... *M. salzmannii*

14. Leaf blade with base attenuate, margin entire; fruit ellipsoid ..... *M. sylvatica*

15. Inflorescence reduced to one flower ..... *M. marianae*

15. Inflorescence in corymb, thyrse or panicle 16

16. Flowers in thyrse, up to 3 lateral branches, 1–3 terminal flowers ..... *M. felisbertii*

16. Flowers in panicle, 4 or more lateral branches, more than 4 flowers irregularly arranged 17

17. Ovary trilocular ..... *M. guianensis*

17. Ovary bilocular 18

18. Calyx lobe completely fused, tearing irregularly during anthesis 19

18. Calyx lobe free or partially fused (with apical pore), tearing regularly during anthesis 23

19. Leaf blade oblong, 14–30 cm long 20

19. Leaf blade ovate or elliptic, 5–12.5 cm long 21

20. Leaves distichous; inflorescence axis tomentose with congested flowers; flowers with 2 pair of bracts ..... *M. obversa*

20. Leaves decussate; inflorescence axis glabrous with lax flowers; flowers with 1 pair of bracts ..... *M. neoverticillaris*

21. Young leaves densely pubescent; secondary veins inconspicuous in both sides, 2 marginal veins; inflorescence axis glabrous ..... *M. neoregeliana*

21. Young leaves glabrous; secondary veins conspicuous in both sides, 1 marginal vein; inflorescence axis pubescent 22

22. Leaf blade ovate or widely elliptic, 5.8–7.5 × 4.3–5.3 cm; floral bud with sericeous indumentum on the basal portion of ovary; petals absent ..... *M. arenaria*

22. Leaf blade elliptic, 6.2–9 × 2.8–4 cm; floral bud glabrous; 1–3 petals ..... *M. excoriata*

23. Floral bud with fused calyx lobes, tearing through an apical pore 24

23. Floral bud with free calyx lobes 25

24. Leaf blade with apex acute; inflorescence with white indumentum; bracteoles covering the floral bud; five regular calyx lobes (size and shape) ..... *M. neuwiedeana*

24. Leaf blade with apex cuspidate; inflorescence with ferrugineous indumentum; bracteoles not covering the floral bud; 3–4 irregular calyx lobes ..... *M. vellozoi*

25. Floral bud with 4 free calyx lobes; hypanthium (also visible in fruit) tearing regularly 26

25. Floral bud with 5 free calyx lobes; hypanthium not tearing 27

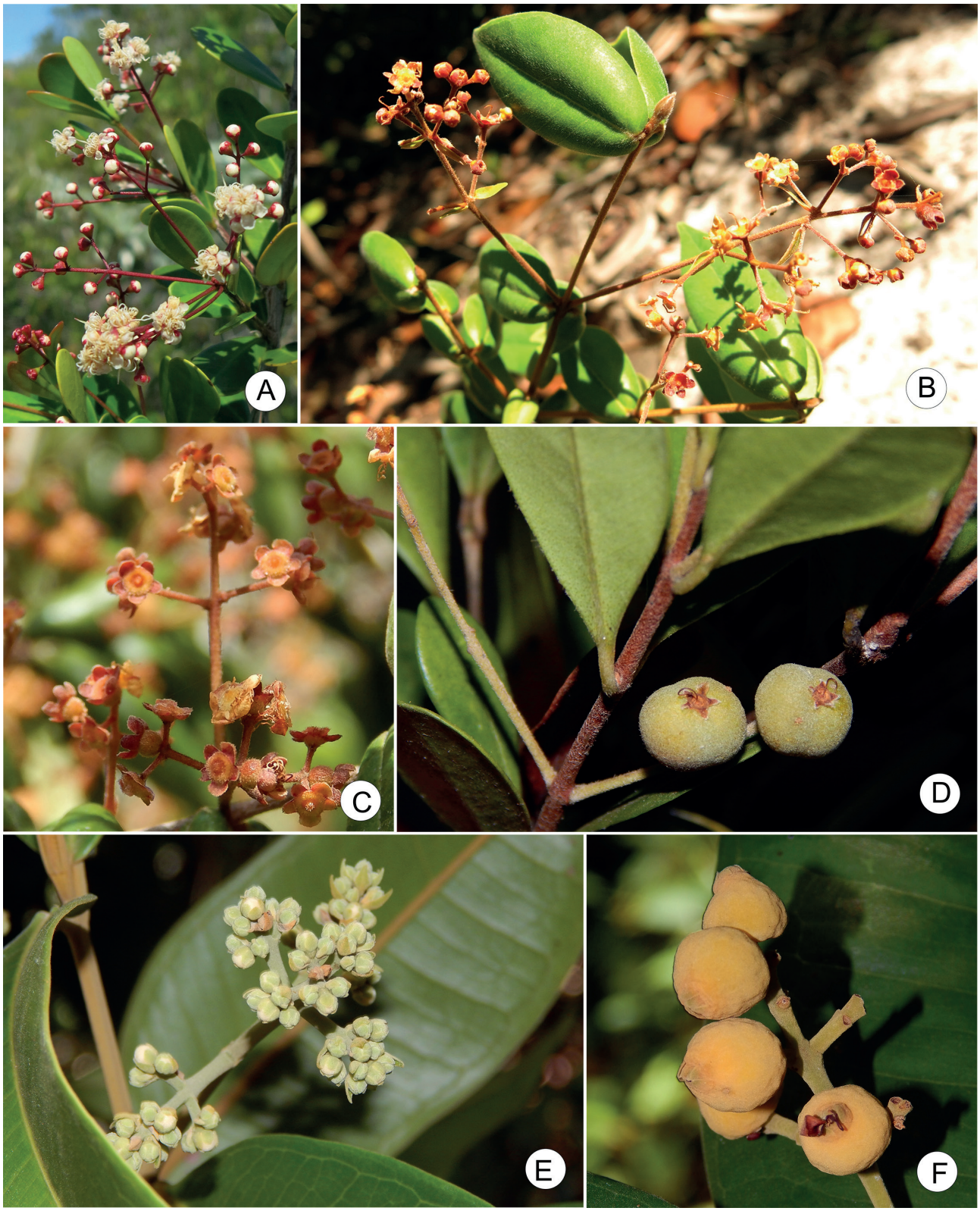

Figure 8. A. *Myrcia ramuliflora*: inflorescence with open flowers and buds. B–C. *M. salzmannii*; B: branch with leaves and inflorescences with old flowers and buds; C: inflorescence with immature fruits. D. *M. spathulifolia*: immature fruits. E–F. *M. vittoriana*; E: inflorescence with flower buds; F: immature fruits. (A–F: J.D.O. Melo).

26. Petiole 6–7 mm long, leaf blade with apex acuminate; hypanthium pubescent ..... *M. multipunctata*

26. Petiole 10–18 mm long, leaf blade with apex caudate; hypanthium velutinous ..... *M. polygama*

27. Leaves whorled (3–4 per node) ..... *M. tetraphylla*

27. Leaves opposite and distichous 28

28. Hypanthium and fruit glabrous 29

28. Hypanthium and fruit pubescent, puberule, sericeous or tomentose 37

29. Leaf blade 21–26 cm long.; inflorescence with foliaceous bracts (1–2.6 cm long) ..... *M. insularis*

29. Leaf blade 2–15 cm long.; inflorescence with non-foliaceous bracts (0.4–1 cm long) 30

30. Plants completely glabrous 31

30. Plants puberule or tomentose 32

31. Leaf blade obovate or oblanceolate, 1.8–4 × 1–2.2 cm, apex rounded; fruit purple ..... *M. ramuliflora*

31. Leaf blade ovate or elliptic, 4.3–7 × 2.7–4 cm, apex acuminate or caudate; fruit vinaceous ..... *Myrcia* sp.

32. Leaf blade orbicular or widely elliptic, 4.5–7 × 3.5–6 cm, strongly discolor when herborized, apex rounded, margin revolute ..... *M. hypophaea*

32. Leaf blade ovate or narrow elliptic, 2.6–14.6 × 1.4–5.2 cm, lightly discolor when herborized, apex acute, margin flat 33

33. Petiole 4.5–10 mm long, 25–33 pairs of secondary veins; inflorescence axis tomentose, flower bud 3–3.5 mm long ..... *M. guedesiae*

33. Petiole 1–3 mm long, up to 17 pairs of secondary veins; inflorescence axis puberule, flower bud 1.5–2.5 mm long 34

34. Leaf blade ovate; lateral branches of inflorescences congested ..... *M. racemosa*

34. Leaf blade elliptic; lateral branches of inflorescence lax 35

35.Synflorescences of congested and bracteate panicles (Fig. 7G); bracts persistent ..... *M. polyantha*

35. Inflorescences axillary and ebracteate; bracts deciduous 36

36. Leaf blade coriaceous, apex acute, secondary veins inconspicuous abaxially; calyx covering completely or almost completely the petaliferous globe in the floral bud, calyx lobes with apex acute ..... *M. decorticans*

36. Leaf blade chartaceous, apex acuminate, secondary veins conspicuous abaxially; calyx not covering the petaliferous globe in the floral bud, calyx lobes with apex rounded ..... *M. multiflora*

37. Plants with ferruginous indumentum; inflorescence in a corymbiform panicle ..... *M. densa*

37. Plants with white, cream or gray indumentum; inflorescence in a triangular panicle 38

38. Leaf blade obovate, apex rounded 39

38. Leaf blade elliptic or oblong, apex acute, acuminate, or caudate 41

39. Plants tomentose; leaf blade chartaceous, secondary vein conspicuous, protruding abaxially; hypanthium constricted above the ovary ..... *M. tomentosa*

39. Plants puberulent to pubescent; leaf blade coriaceous, secondary vein inconspicuous in both sides; hypanthium not constricted above the ovary 40

40. Leaves opposite and decussate, appressed; leaves, young branches, inflorescences, calyx, hypanthium, and fruits densely pubescent; calyx lobes triangular, apex acute ..... *M. spathulifolia*

40. Leaves opposite and distichous, ascending; leaves glabrous, inflorescences puberulous, hypanthium sericeous, calyx and fruits with sparse trichomes; calyx lobes ovate, apex rounded ..... *M. littoralis*

41. Leaf blade 18–26.5 cm long., base rounded, cordate or subcordate; inflorescence auxotelic, with cataphylls on the basal portion (1.3–1.8 cm long) ..... *M. raminfinita*

41. Leaf blade 1.7–10 cm long, base attenuate or obtuse; inflorescence not auxotelic, cataphylls absent 42

42. Leaf blade smooth, apex caudate; calyx lobes erect on the fruit ..... *M. racemosa*

42. Leaf blade bullate, apex acute or shortly acuminate; calyx lobes adpressed on the fruit ..... *M. hirtiflora*

Key to the species of ***Myrciaria*** *from restinga of Bahia*

1. Leaves with petioles 2–3 mm long, leaf blade 3.1–3.7 × 0.8–1.2 cm, margin revolute, base cordate; calyx lobes fused in the bud ..... *M. strigipes*

1. Leaves with petioles 4–9 mm long, leaf blade 4.4–8.8 × 1.8–3.6 cm, margin flat, base cuneate or attenuate; calyx lobes free in the bud 2

2. Leaf blade with acuminate apex; sessile flowers; bracteoles elliptic, 2–3 × 1.8–2 mm ..... *M. glomerata*

2. Leaf blade with cuspidate apex; flowers with pedicels (1–2 mm long); bracteoles ovate, 0.5–1.1 × 1–1.3 mm 3

3. Leaf blade, bract, and bracteole glabrous ..... *M. floribunda*

3. Abaxial surface of leaf blade, bract, and bracteole puberulous ..... *M. pilosa*

Key to the species of ***Neomitranthes*** *from restinga of Bahia*

1. Leaf blade with apex rounded or acute, margin revolute; inflorescence in short raceme, axis 1–4 mm long, flowers pedicellate (pedicel 1–2 mm long) ..... *N. obtusa*

1. Leaf blade with apex acuminate, margin flat; inflorescence in glomerules, axis 0.1–0.9 mm long, flowers sessile ..... *N. obscura*

Key to the species of ***Psidium*** *from restinga of Bahia (Figs. 9 and 10)*

1. Leaves sessile or subsessile (petiole 0.1–3 mm long) 2

1. Leaves petiolate (petiole 3–10 mm long) 3

2. Leaf blade orbicular, apex rounded; bud opening by apical pore, calyx lobes tearing the staminal ring ..... *P. amplexicaule*

2. Leaf blade ovate, apex acute or acuminate; bud completely closed, with apiculum, calyx lobes not tearing the staminal ring ..... *P. brownianum*

3. Leaf blade obovate or oblanceolate; bud opening by apical pore, tearing the staminal ring during anthesis ..... *P. cattleyanum*

3. Leaf blade ovate, elliptic or obovate; bud completely closed or opening by apical pore, not tearing the staminal ring during anthesis 4

4. Leaf blade with apex cuspidate (11–15 mm long); calyx lobes completely fused in the bud, opening irregularly or by calyptra ..... *P. oligospermum*

4. Leaf blade with apex acute or acuminate (2–7 mm long); calyx lobes partially fused in the bud, with an apical pore, tearing irregularly, never by calyptra 5

5. Inflorescence in raceme; ovary with 3 locules, 28–33 ovules per locule; fruit subglobose, 15–20 seeds ..... *P. bahianum*

5. Inflorescence in dichasium or solitary flowers; ovary with 3–6 locules, 50–180 ovules per locule; fruit pyriform or globose, ca. 250 seeds 6

6. Branches, leaves, inflorescence and flowers with reddish, white, or yellowish pubescent indumentum; leaf blade with 8–10 pairs of secondary veins ..... *P. guineense*

6. Branches, leaves, inflorescence and flowers glabrous or glabrescent, in this case with white indumentum; leaf blade with 10–20 pairs of secondary veins ..... *P. guajava*

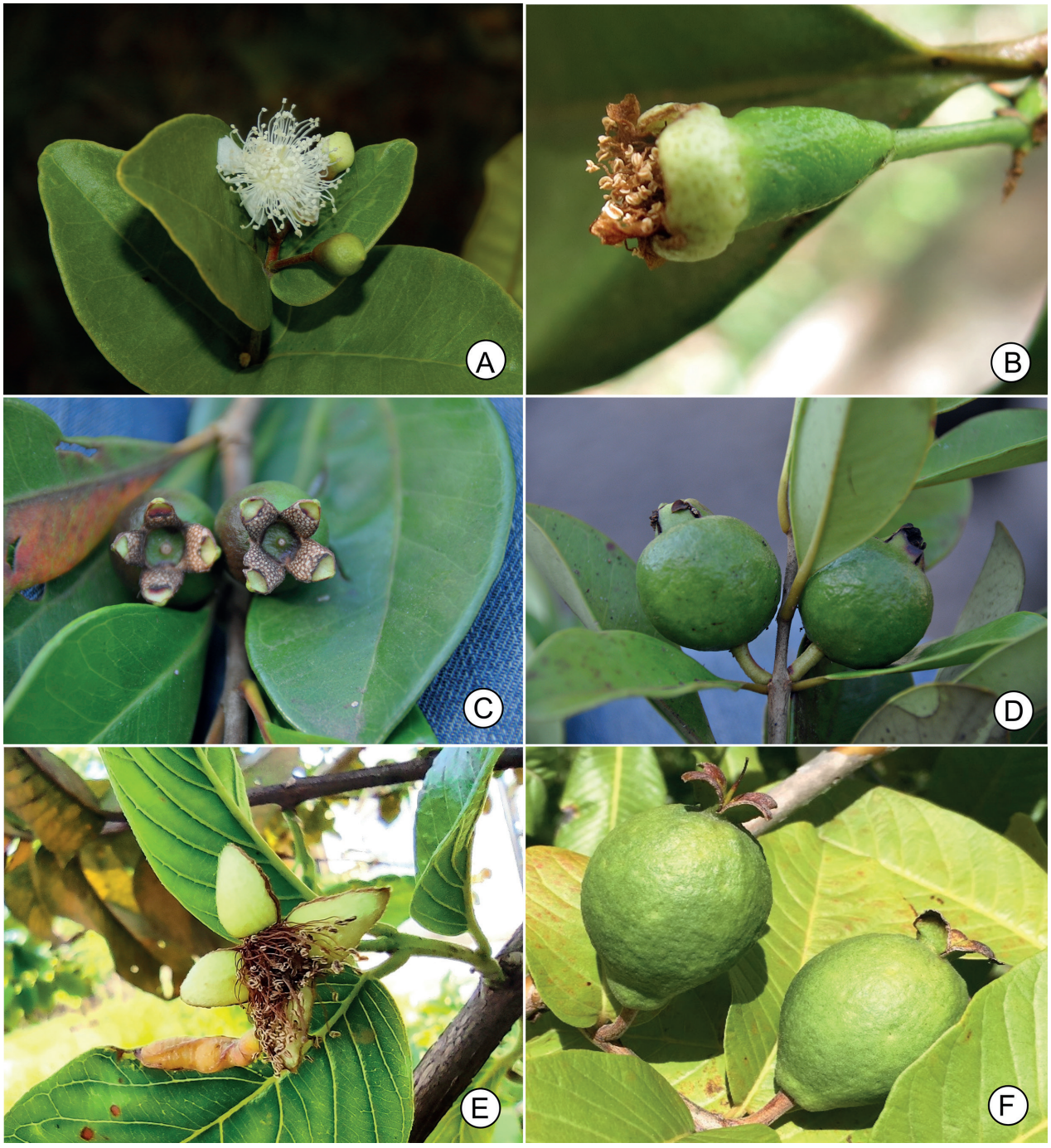

Figure 9. A–B. *Psidium brownianum*; A: flower buds and flower (bud completely closed, with apiculum); B: immature fruit. C–D. *P. cattleyanum*; C: immature fruits with staminal ring torn by the calyx lobes at anthesis; D: immature fruits. E–F. *P. guajava*; E: flower which the petals already fallen; F: immature fruits (A. J.D.O. Melo; B, E. A. Stadnik; C, D. T. Vasconcelos; F. L. Lucresia).

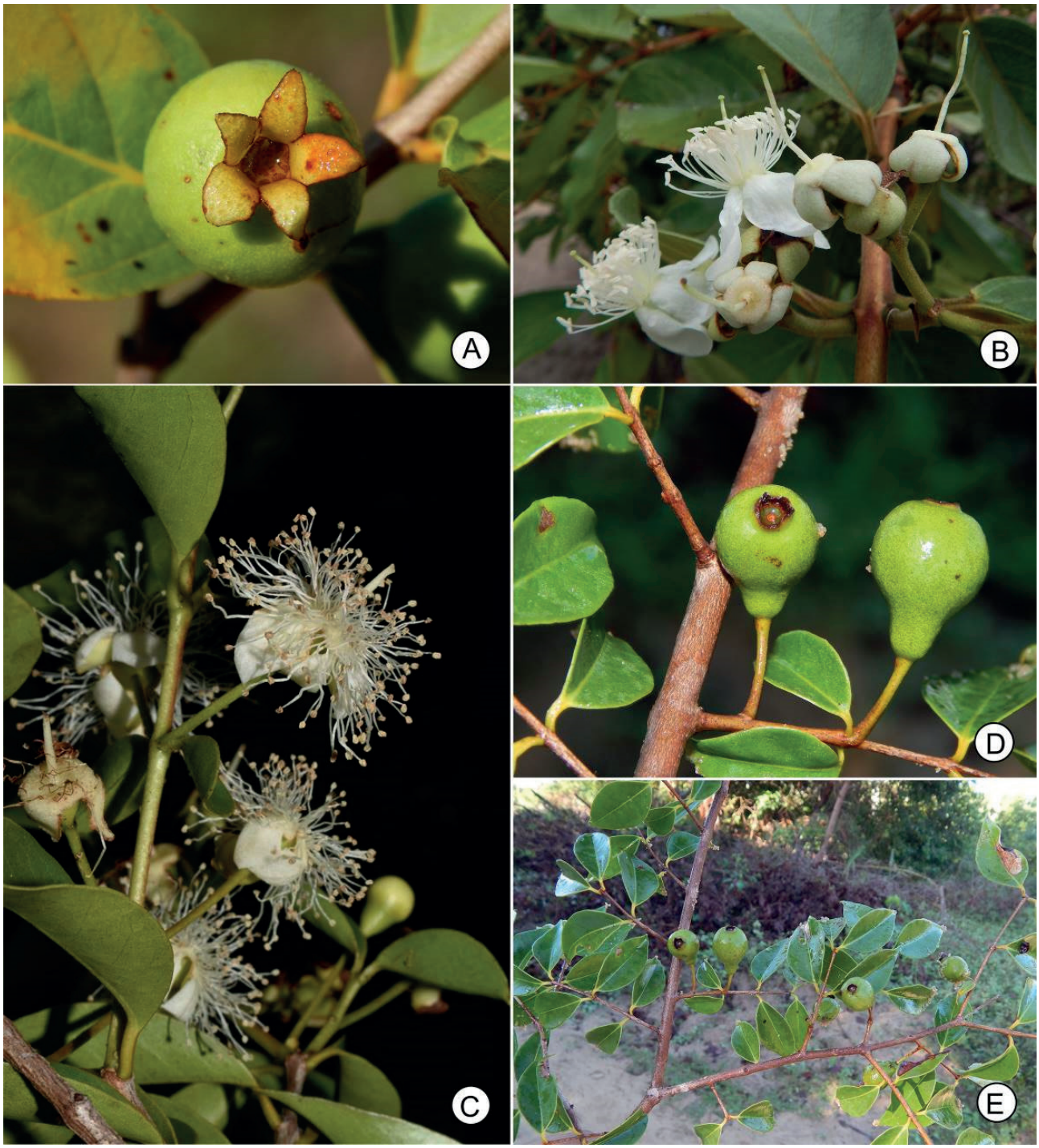

Figure 10. A–B. *Psidium guineense*; A: immature fruit; B: young and old flowers (the petals and the stamens already fallen). C–E. *P. oligospermum*; C: inflorescence with young and old flowers, and bud; D: immature fruits; E: branches with leaves and fruits (A, B, D, E. J.D.O. Melo; C. T. Vieira).

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