



Revision of *Eugenia* section *Phyllocalyx* (Myrtaceae)

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Abstract

Eugenia section *Phyllocalyx*, a mainly Brazilian Atlantic Forest group of 16 species, is revised based on a study of over 2000 plant collections. The relationships of *Eugenia* sect. *Phyllocalyx* to other sections in *Eugenia* are discussed. All species are described and comments about geographic distribution and morphology are provided. An identification key and notes about its conservation status are also presented. Lectotypes are chosen for six species and second-step lectotypification is proposed for two species.

Keywords: Atlantic Forest, Cerrado, Eugeniinae, Myrteae, taxonomy

Introduction

Eugenia Linnaeus (1753: 470) is the biggest genus of Myrtaceae in the Neotropics with ca. 1100 species. In Africa the genus has ca. 60 species, but this number has been increasing in the last years (van der Merwe *et al.* 2005; Snow 2011) as in the Mesoamerica (Barrie 2005). It is sparsely represented in much of Malesia, and absent from New Zealand and Chile (Snow 2011).

The genus consists of shrubs or trees, with 4–6-merous flowers, the calyx open or closed in the bud, a 2–4-locular ovary with 2-numerous ovules, the fruit crowned by the calyx-lobes, remnants of the calyx or by a circular scar, 1–2 seeds, seed coat membranous or crusty and the embryo a solid mass or with two discrete plano-convex cotyledons (Landrum and Kawasaki 1997; Holst *et al.* 2003).

Berg (1855–1856) classified sections in *Eugenia* based on the inflorescence morphology: *Eugenia* sect. *Uniflorae*, *Eugenia* sect. *Biflorae*, *Eugenia* sect. *Glomeratae*, *Eugenia* sect. *Umbellatae*, *Eugenia* sect. *Corymbiflorae*, *Eugenia* sect. *Racemosae*, *Eugenia* sect. *Dichotomae* and *Eugenia* sect. *Racemosae*. Two groups of species of *Eugenia* with inflorescences with well developed bracts were segregated by Berg as distinct genera, *Stenocalyx* O.Berg (1855–1856: 309), with narrow sepals, and *Phyllocalyx* O.Berg (1855–1856: 306), with wide and occasionally foliaceous sepals. Nevertheless, these two genera were mostly relegated to its synonymy by later authors (e.g. Niedenzu 1893, Kiaerskou 1893, McVaugh 1968, Landrum & Kawasaki 1997).

Recently, based on a molecular (nuclear and plastid markers) phylogenetic analysis, Mazine *et al.* (2014) recognized nine clades in *Eugenia* *s.l.* These authors also supported the inclusion of *Calycorectes*, *Hexachlamys*, *Phyllocalyx* and *Stenocalyx* in *Eugenia*. The “Phyllocalyx clade” or “clade 6” (bootstrap 98%, according to *sensu* Mazine *et al.* 2014) refers to *Eugenia* sect. *Phyllocalyx* Nied. being composed with species of *Phyllocalyx sensu* Berg (1855–1856). Kiaerskou (1893) has already combined several species of *Phyllocalyx* into *Eugenia* indicating this new proposal and Niedenzu (1893) formally changed this concept naming the section as *Eugenia* sect. *Phyllocalyx*. The section is characterized by peduncles with leaf-like bracts and showy sepals, proportionally larger than the flowers (Berg 1857–1859, under *Phyllocalyx*).

Bünger *et al.* (2016a) conducted the phylogeny of *Eugenia* sect. *Phyllocalyx* including more samples and molecular markers. They showed the need of a re-circumscription of *Eugenia* sect. *Phyllocalyx* and confirmed the position of *Eugenia wentii* based on molecular and morphological evidences, proposing a new section for the *Eugenia wentii* clade. The study of character evolution carried out by these authors helped to find synapomorphies to characterize the two sections. Then, in a posterior work, Bünger *et al.* (2016b) circumscribed the new section (*Eugenia* sect. *Speciosae* Bünger & Mazine in Bünger *et al.* 2016b) and presented a synopsis for the group, with six species, four of which were formerly placed in *Eugenia* sect. *Phyllocalyx*. At the same time, Mazine *et al.* (2016) circumscribed the genus *Eugenia* in its current sense and provided detailed descriptions of the resulting nine infra-generic sections, including *Phyllocalyx* and *Speciosae*.

Considering this new concept, *Eugenia* sect. *Phyllocalyx* is characterized by bracteoles mostly deltate, showy, embracing the ovary and persistent at anthesis even in the mature fruits. Additionally, the showy calyx and bracteoles are present in all species of this section.

This study provides the taxonomic treatment for the 16 species of *Eugenia* sect. *Phyllocalyx* with descriptions, identification key for the species and discussion about morphology, geographic distribution and conservation status.

Materials and methods

We analyzed 2037 herbarium specimens, including types, held in BR, BHCb, BM, ESA, G, HB, HPL, HRCB, HUFU, K, LE, M, MBM, MBML, OUPR, OX, P, R, RB, SP, SPF, UEC, UPCB (acronyms follow Thiers 2019). Field expeditions were conducted the known distribution areas of *Eugenia* sect. *Phyllocalyx* species in order to observe overall population structure and variation of morphological features between individuals, as well as to improve habit and site of occurrence information. Only fully developed structures from mature plants were used for morphological analysis. Floral characters were studied in both dry and rehydrated flowers. Phenological, distributional and habitat data were obtained from the same material, both from above cited herbaria and living plants. Morphological descriptions follow the terminology of Radford *et al.* (1974). We used “=” symbol for heterotypic synonyms and “≡” for homotypic one. The distribution map was produced with ArcGIS version 9.3 (ESRI 2011).

Taxonomy

Here we present a taxonomic revision of *Eugenia* sect. *Phyllocalyx*, updating its circumscription in order to reflect the phylogeny presented by Bünger *et al.* (2016a). We present morphological descriptions, nomenclatural updates, identification key and comments about all species.

Taxonomic history

Berg (1855–1856) described the genus *Phyllocalyx* and segregated some *Eugenia* species in the genus listing 25 species. Berg thought that his treatment for the *Flora Brasiliensis* (1857–1859) would be published before the treatment of American Myrtaceae in *Linnaea* (Berg 1855–1856). Hence, he just listed the Brazilian species in *Linnaea*; he described in fact these species in *Flora Brasiliensis* (1857–1859). About 30 years later, Kiaerskou (1893) placed all species of *Phyllocalyx* into *Eugenia* and Niedenzu (1893) named this group of species as a section of *Eugenia*. The name *Phyllocalyx* O. Berg (1855–1856) is illegitimate, being a later homonym of *Phyllocalyx* A. Richard (1847: 160). When Niedenzu (1893) transferred *Phyllocalyx* O. Berg to *Eugenia*, he named it *Eugenia* sect. *Phyllocalyx*. We treat this name as a *nomen novum* with the same type as the illegitimate name (Article 58.1, Turland *et al.* 2018).

In the XXth century, McVaugh (1956b) did the necessary lectotypifications for the sections of *Eugenia*; between these he lectotypified *Phyllocalyx*, selecting *P. involucratus* (DC.) O. Berg (= *Eugenia involucrata* DC.) as the type.

Until now, several “*Phyllocalyx* species” were described by recent authors (Amshoff 1942, Mattos 1974, 1975, 1989, Bünger *et al.* 2013, 2016b, 2018) and some nomenclatural notes were published on names with synonymizations and combinations (Sobral *et al.* 2010, Bünger *et al.* 2014, 2016c). After the phylogenetic study of Bünger *et al.* (2016a), the concept of the section was clarified and some species formerly placed in it were transferred to the new section *Speciosae*, as *E. wentii* Amshoff (1942: 158), *E. speciosa* Cambessèdes (1832: 351), *E. longipetiolata* Mattos (1968: 162) and *E. bunchosiifolia* Niedenzu (1893: 82).

Following recent phylogenetic analysis (Bünger *et al.* 2016a) we circumscribe *Eugenia* sect. *Phyllocalyx* as a group containing all species previously treated within it by Berg (1857–1859) plus all taxa described by following authors (Martius 1837, Barbosa Rodrigues 1907, Mattos 1974, 1975, 1989, Bünger *et al.* 2013, 2016c, 2016d, 2018), except for two species (*E. bunchosiifolia* and *E. speciosa*), which belong to *Eugenia* sect. *Speciosae*.

Distribution and habitat

Eugenia sect. *Phyllocalyx* is mostly endemic to the coastal Atlantic Forest, with exception of *E. involucrata*, which is widespread in the Atlantic Forest and Cerrado Domains (also occurring outside Brazil; Argentina, Bolivia, Paraguay and Uruguay) and *E. glandulosa*, which is endemic to the Cerrado Domain, chiefly distributed in Central Brazil and Minas Gerais state.

The distribution of the group within Atlantic Forest is strongly associated with the Southern Atlantic coast of Brazil in the rainforests below 700 m elev. Hence, a key area of diversity is the region that comprises the coast of Espírito Santo, Rio de Janeiro, São Paulo, and Paraná states. The rainforest of São Paulo is the richest area for *Eugenia* sect. *Phyllocalyx* with seven species: *Eugenia elongata*, *E. expansa*, *E. macrobracteolata*, *E. magnibracteolata*, *E. membranifolia* and *E. regia*. The second richest region is the rainforest and *restingas* of Rio de Janeiro, which comprises six species with one endemism (*Eugenia selloi*). Only *E. puberula* is found through the coast, between Rio de Janeiro and Maranhão states.

The group comprises trees or treelets present in the rainforests, almost all growing in small populations, except *Eugenia selloi* and *E. luschnathiana*. Both species grow in the *restingas*, where they are abundant. Some species are from the Cerrado biome (*Eugenia glandulosa* and *E. involucrata*) and from the *campos rupestres* (*E. involucrata*) above 700 m elev. in the Espinhaço Range. In this type of formation, the species are usually shrubs and are found in sandy and rocky substrates. Sometimes they have adaptations to fire, as xylopodium in *Eugenia glandulosa*.

Morphology

Habit

Most of the species of *Eugenia* sect. *Phyllocalyx* are treelets, but trees are also frequent. The species which occur in the Cerrado domain, *campos rupestres* or *restingas* are sub-shrubs or shrubs and rarely trees. *Eugenia glandulosa* and *E. involucrata* sometimes present xylopodium, which promotes survival of the individuals after damage or complete removal of aerial parts by fire, a frequent disturbing factor in the *cerrados*. The species most variable in all aspects and even in its habit is *E. involucrata* that can be a sub-shrub with 0.1 m to a tree 25 m tall. Generally, the habit is not a feature that allows distinguishing taxonomically the species.

Indumentum

The density and distribution of the indumentum is often taxonomically useful. Species of *Eugenia* sect. *Phyllocalyx* varies from densely covered with hairs, at least in one structure, to essentially glabrous. Hairs are unicellular, simple (unbranched) in most species. The ovary's vestiture is one of the most taxonomic features to identify the species of this section. For example, whitish trichomes covering the ovary are present in *Eugenia espinhacensis*, *E. macrobracteolata* and *E. puberula*. *Eugenia involucrata* is the single species that has glabrous ovary, as the other structures.

Leaf morphology

Leaves are essentially opposite. Leaf venation in *Eugenia* sect. *Phyllocalyx* is brochidodromous with more or less straight lateral veins that leave the midvein at an angle greater than 45 degrees and unite with a marginal vein that closely parallels the margin. Some species could have two marginal veins (*Eugenia magnibracteolata*, *E. membranifolia*, *E. puberula*, *E. regia* and *E. selloi*). Secondary veins may be prominent, weakly marked or indistinguishable. The visibility of the tertiary veins helps to distinguish *E. magnibracteolata* from its apparent relatives.

Inflorescences

The morphology of the inflorescence in Myrtaceae is historically controversial and commonly shows different degrees of elaboration (Briggs & Johnson 1979, Barroso *et al.* 1984). In *Eugenia s.l.* this was a feature to distinguish the sections inside the group (Berg 1855–1856), but recent studies (Mazine *et al.* 2014) conclude that this cannot be used alone as a strong character to define infrageneric groups. The inflorescence of *Eugenia* sect. *Phyllocalyx* is traditionally reported as a “solitary inflorescence”, “bracteate shoot” or “stenocalyx inflorescence” (Berg 1855–1856, Niedenzu 1893, McVaugh 1968, Barroso *et al.* 1984, Landrum & Kawasaki 1997). In all cases, the shoot axis of the new season continues growth beyond the flowering region. Eventually, the fruits assume a basal position according to further vegetative growth. Overall, the architecture of the inflorescence is result of the difference in the degree of branching and/or number of internodes and/or their elongation. In young branches, the species have 2–4 or even more flowers united in lateral or terminal flowering axes. But, when the shoot is well developed, it seems a solitary flower along the branch. To incorporate the flexibility of arrangements of species under descriptions we adopted the concept “auxotelic” sensu Briggs & Johnson (1979) in reference to this flowering shoot system.

Bracteoles

Bracteoles are paired and embracing the base of the hypanthium, with a wide variation in size ranging from 1.5 to 28 mm long. The shape may be deltate or elliptic and persist until the mature fruits, except in *E. selloi* where they are caducous at anthesis. The persistence of leaf bracteoles in the mature fruits is unique in this group and helps to distinguish this section from the others. They could be ciliate (only *Eugenia glandulosa*, *E. membranifolia* and *E. puberula*) or not (all the other species) and be covered with trichomes or glabrous.

Calyx

The calyx is foliaceous in all species with the sepals concealing the apex of the ovary, except in *E. glandulosa*. The calyx is also one of the most variable organs in *Eugenia* sect. *Phyllocalyx*. The sepals can be ciliate (only *Eugenia glandulosa* and *E. membranifolia*) or not (all the other species); they can have two pairs with the same size (only *Eugenia ruschiana* has the two pairs with different size); they can have lots of dots (*E. glandulosa*). Generally, the calyx-lobes are covered by some indumentum at least adaxially, but *E. involucrata* has glabrous and not ciliate sepals.

Fruits

The fruits are mostly globose except in *Eugenia involucrata* with oblong fruits and *E. selloi* with costate-oblong fruits. Fruits are crowned by a persistent calyx and commonly glabrous, but can also be pubescent, as in *E. magnibracteolata*. They are all fleshy as in other Neotropical Myrtaceae and most of them may be edible receiving suggestive names as “pitangatuba” (*E. selloi*) and “cereja-do-mato” (*E. involucrata*).

Description

Eugenia section *Phyllocalyx* Niedenzu (1893: 82). = *Phyllocalyx* O.Berg (1855–1856: 306), *nom. illeg.*, non A.Richard (1847: 160). = *Eugenia* subgenus *Phyllocalyx* (Niedenzu) Mattos (1989: 1). Type species (lectotype designated by McVaugh 1956b: 144): *Phyllocalyx involucratus* (De Candolle) O.Berg (1855–1856: 307). Type species of section: *Eugenia involucrata* De Candolle (1828: 264); type:—BRAZIL, Rio de Janeiro, *Martius s. n.* (holotype G!).

Sub-shrubs to trees, glabrous or with trichomes. **Leaves** opposite. **Inflorescence** auxotelic. **Bracteoles** 2, deltate or elliptic, embracing the ovary, persistent in the mature fruits. **Flowers** 4–merous, petals white, rarely pink, sepals concealing the apex of the ovary and foliaceous. **Ovary** 2–locular, several ovules per locule. **Fruit** fleshy, 1–4 seeds.

Key to identification the species of *Eugenia* sect. *Phyllocalyx*

1.	Blades subverticillate.....	<i>E. elongata</i>
-.	Blades opposite.....	2
2.	Ovary and fruits costate.....	3
-.	Ovary and fruits not costate.....	4
3.	Bracteoles caducous.....	<i>E. selloi</i>
-.	Bracteoles persistent.....	<i>E. magnisepala</i>
4.	Ovary tomentose or villose.....	5
-.	Ovary pubescent or glabrous.....	8
5.	Ovary rusty-tomentose.....	<i>E. salaciifolia</i>
-.	Ovary whitish-tomentose or villose.....	
6.	Blades with one marginal vein, bracteoles > 15 mm long.....	<i>E. macrobracteolata</i>
-.	Blades with two marginal veins, bracteoles < 15 mm long.....	7
7.	Young twigs and petioles glabrous.....	<i>E. puberula</i>
-.	Young twigs and petioles pubescent.....	<i>E. espinhacensis</i>
8.	Blades > 100 mm long.....	9
-.	Blades < 100 mm long.....	12
9.	Blades chartaceous, lateral veins raised on both sides, fruits tomentose or lepidote.....	
	<i>E. magnibracteolata</i>
-.	Blades coriaceous, lateral veins raised only abaxially, fruits pubescent.....	10
10.	Bracteoles < 13 mm long.....	<i>E. ruschiana</i>
-.	Bracteoles > 13 mm long.....	11
11.	Blades glabrous, lateral veins 19–25, one marginal vein, calyx pubescent.....	<i>E. itacarenis</i>
-.	Blades floccose, at least abaxially, lateral veins 25–40, two marginal veins, calyx tomentose.....	<i>E. regia</i>
12.	Bracteoles ciliate and blades with dots visible on both sides.....	<i>E. glandulosa</i>
-.	Bracteoles not ciliate and blades with dots not or scarcely visible on both sides.....	13
13.	Blades abaxially reddish–brown sericeous, at least the young ones.....	<i>E. expansa</i>
-.	Blades glabrous or glabrescent without reddish–brown trichomes.....	14
14.	Bracteoles elliptic, young blades pubescent with reddish trichomes and sometimes covered with yellow or white trichomes.....	
	<i>E. luschnathiana</i>
-.	Bracteoles deltate, young blades glabrous or glabrescent.....	15
15.	Blades with margin revolute, two marginal veins, bracteoles ciliate or not, inflorescence terminal.....	<i>E. membranifolia</i>
-.	Blades with margin plane or slightly revolute, one marginal vein, bracteoles not ciliate, inflorescence subaxillary.....	
	<i>E. involucrata</i>

1. *Eugenia elongata* Niedenzu, *Natürlichen Pflanzenfamilien* 3, Abt. 7: 82. 1893. Type:—*Habitat in prov. S. Pauli: Sellow s/n* (holotype B f; **lectotype here designated**: BR 526951!). **Figure 1A.**

≡ *Phyllocalyx racemosus* O. Berg, *Flora Brasiliensis* 14 (1): 334. 1857, non *Eugenia racemosa* Linnaeus (1753: 471).

Trees. Leaves subverticillate with petioles 3.9–7.7 × 2.8–3.2 mm, canaliculate, glabrous; blades elliptic, 134–195 × 39.3–49 mm, coriaceous, discolorous, glabrous, glandular dots scarcely visible on both sides; apex acuminate; base acute; margin revolute; midvein sulcate adaxially, raised abaxially; lateral veins 19–30 on each side, raised on both sides; marginal veins 2, the inner 2.6–3.5 mm and the outer 1–1.3 mm from the margin. Inflorescences auxotelic; pedicels 3.5–3.6 mm long, pubescent; bracteoles concealing the ovary, elliptic, ca. 6.7 × 3.4 mm, apex acute, pubescent, not ciliate, probably persistent at anthesis. Buds obpyriform, 6.4–8.3 × 3.1–4.7 mm; calyx lobes 4, ovate, equal in size, ca. 3 × 4.4 mm, pubescent, ciliate; petals 4, ca. 3.5 × 2.1 mm, pubescent, ciliate; ovary ca. 3 × 3.5 mm, pubescent, style not seen, staminal ring not seen. Fruits not seen.

Phenology:—Not possible to determine.

Distribution and habitat:—Occurring in São Paulo State (Brazil).

Notes:—*Eugenia elongata* is known only by the type specimen. It was placed by Berg under *Phyllocalyx* and we opted to maintain here in the section even if the deciduity of the bracteoles is unknown. This species is characterized by its subverticillated leaves, which allows to distinguish it from other species of the section.

2. *Eugenia espinhacensis* Büniger & Sobral, *Phytotaxa* 147: 55. 2013. Type:—BRAZIL. Minas Gerais: Estrada de Virgem da Lapa a Diamantina, 10 December 1980 (fl, fr), *Cordeiro et al s/n* (holotype BHCB 164426!; isotype SPF 22498!). **Figure 1B.**

Treelets 3–5 m tall; young twigs rusty-pubescent. Leaves with petioles 3–9 × 1–1.6 mm, canaliculate, pubescent; blades elliptic, 50–95 × 13–27 mm, chartaceous, discolorous, adaxially glabrescent, the abaxial side with trichomes on

the midvein, glandular dots not visible on both sides; apex acuminate; base acute or attenuate; margin plane; midvein sulcate adaxially, raised abaxially; lateral veins 14–20 on each side, scarcely or not visible on either side, sometimes faintly raised abaxially; marginal vein 1.2–2.1 from the margin. Inflorescences auxotelic, pedicels 7–12 mm long, rusty-tomentose; bracteoles concealing the ovary, deltate, 3.4–11.9 × 2.9–10 mm, apex acute, rusty-pubescent, not ciliate, persistent at anthesis. Buds obpyriform 11.78 × 10.2 mm; calyx lobes 4, of equal size, ovate, apex acute, 7–8 × 5–6.1 mm, rusty-pubescent, not ciliate; petals 4, 9–11.5 × 15–16.5 mm, glabrescent, not ciliate; ovary ca. 6.9 × 4 mm in diameter, whitish-tomentose; style ca. 12 mm long, staminal ring subquadrate. Fruits globose, 10.5–14.5 mm in diameter, sparsely pubescent, 1 seed ca. 8 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.



FIGURE 1 A) *Eugenia elongata* (Sellow s/n LE), B) *E. espinhacensis* (Cordeiro *et al.* s/n SPF 22498), C) *E. expansa* (Peron, M. *et al.* 898 BHCb, RB), D) *E. glandulosa* (Rosa, P. O. *et al.* 16 BHCb, HUFU).

Specimens examined:—**BRAZIL. Minas Gerais:** Barão de Cocais, *Filho et al.* 142 (OUPR!); Catas Altas, *Mota 86* (BHCb!; SP!).

Phenology:—Flowers in December and February; fruits in October and December.

Distribution and habitat:—Occurring on the *campos rupestres* along the Espinhaço Range in Minas Gerais.

Notes:—*Eugenia espinhacensis* is apparently related to *E. puberula*, from which it can be distinguished through the young twigs and petioles pubescent, blades with one marginal vein (*versus* young twigs and petioles glabrous and two marginal veins) and habitat (“*campos rupestres*” *versus* rainforests).

3. *Eugenia expansa* Spring ex Martius, Flora 20 (Beibl. 2): 84. 1837. Type:—BRAZIL. In Serra d'Estrella, Luschnath 37 (holotype: BR 522979!). **Figure 1C.**

= *Eugenia cuprea* (O.Berg) Niedenzu, Natürlichen Pflanzenfamilien 3, Abt. 7: 82. 1893. ≡ *Phyllocalyx cupreus* O. Berg, Flora Brasiliensis 14 (1): 592. 1859. Type:—BRAZIL. Habitat in umbrosis siccis prope Mandioca prov. Rio de Janeiro, florebat Octobri: Riedel (holotype LE, photo!; isotypes K 000170005!, P 00723734!, F 0065665F, U 0005013).

= *Eugenia grandisepala* Mattos, Loefgrenia 66: 7. 1975. Type:—BRAZIL. Paraná: Guaraquecaba, Santo Murato, 21 Dec. 1970, Hatschbach 25812 (holotype MBM 20885!, isotype US, photo!).

= *Eugenia graziellae* Mattos & D. Legrand, Loefgrenia 67: 24. 1975. Type:—BRAZIL. Guanabara: Rio de Janeiro, Graziela [Maciel Barroso] 6046 (holotype MVM, photo!; isotypes SI 002754, RB 00542108).

Trees or treelets 2–8 m tall; mature twigs reddish-brown pubescent. Leaves with petioles 4 × 6 mm long, canaliculate, pubescent; blades oblong, 50–100 × 10–35 mm, chartaceous, discolorous, adaxially glabrous, abaxially reddish-brown sericeous, glandular dots not visible on both sides; apex acuminate or rostrate; base cuneate; margin plane; midvein sulcate adaxially, raised abaxially; lateral veins 18–30 on each side, scarcely visible on both sides; marginal vein ca. 1 mm from the margin. Inflorescences auxotelic; pedicels 15–30 mm long, pubescent; bracteoles concealing the ovary, elliptic or deltate, 3.7–6 (15) × 1.9–2.2 (9) mm, apex acute or obtuse, pubescent, not ciliate, persistent at anthesis. Buds obpyriform, 5.2–10 mm × 3.7–7.5 mm; calyx lobes 4, lanceolate, of equal size, 7–15 × 3–6 mm, glabrescent, glabrous or rarely pubescent, not ciliate; petals not seen; ovary ca. 3.5 × 5 mm, pubescent, style ca. 15 mm long, staminal ring subquadrate. Fruits elliptic, 5.6–7.2 mm in diameter, pubescent, eventually glabrescent, 1 seed ca. 4.5–5 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.

Specimens examined:—BRAZIL. Paraná: Guaraquecaba, Ziller 577 (ESA!). Rio de Janeiro: Nova Friburgo, Guedes s/n (HUEFS 165901!); Rio de Janeiro, Bünger & Souza 630 (BHCB!); idem, Bünger & Souza 634 (BHCB!). São Paulo: Cananéia, Batista 67 (ESA!, SP!, UEC!); idem, Souza, et al 1540 (BHCB!, ESA!); idem, Bünger & Moura-Junior 625 (BHCB!); idem, Staggemeier 60 (BHCB!); idem, Silva 37 (ESA!); idem, Batista 78 (ESA!); idem, Baitello 26 (FURB!); idem, Castro 80 (BHCB!); Eldorado, Rodrigues 190 (ESA!, SP!); idem, Rodrigues 190 (ESA!); Iguape, Piacentin et al. 51 (BHCB!); São Miguel Arcanjo, Moraes 731 (ESA!, SP!); idem Aguiar s/n (ESA 105476!); idem, Moraes 821 (ESA!); Sete Barras, Kawasaki 660 (SP!); idem, Souza 29360 (ESA!); idem, Souza 9361 (ESA!); idem, Souza 29359 (ESA!); idem, Duarte 514 (ESA!); idem, Sampaio, 158 (ESA!); idem, Almeida-Scabbia et al. 1023 (BHCB!); Ubatuba, Lobo UEC29371 (ESA!, SP!, UEC!); idem, Lobo 29371 (ESA!); São Sebastião, Souza 21612 (ESA!); idem, Dias Filho et al. 971 (BHCB!, ESA!); idem, Ivanauskas 117 (ESA!); idem, Ivanauskas 586 (ESA!); Matão, Rozza 137 (BHCB!, ESA!).

Phenology:—Flowers in October and November; fruits in October, November and December.

Distribution and habitat:—Occurring in the restingas and rainforests along the Serra do Mar from Paraná to Rio de Janeiro states. Occasionally growing in higher altitudes, at ca. 700 m elev. in Macaé de Cima in Rio de Janeiro State.

Notes:—*Eugenia expansa* is easily recognized by its reddish-brown sericeous vestiture on the abaxial leaves.

4. *Eugenia glandulosa* Cambessèdes, Fl. Bras. Merid. 2: 352. 1832.

Type:—BRAZIL. In pascuis prope Candonga (Minas Geraes), Laruotte in Saint-Hilaire s/n (lectotype here designated: P 01902386!; isolectotypes P 01902388, P 01902387!). **Figure 1D.**

≡ *Phyllocalyx glandulosus* (Cambess.) D. Legrand, Notul. Syst. (Paris) 15: 270. 1958.

= *Eugenia obtusa* Barbosa Rodrigues ex Chodat & Hassler, nom. nud., Bull. Herb. Boissier 2,7: 807. 1907, non De Candolle, Prodr. 3: 266. 1828. ≡ *Eugenia incertissima* Sobral, nom. illeg., Candollea 42: 109. 1987. Type:—PARAGUAY. Vaqueria Capivari, Hassler 4407 (holotype G!; isotype K!).

= *Eugenia heringeriana* Mattos, Loefgrenia 62: 3. 1974. Type:—BRAZIL. Distrito Federal: Brasília, Granja de Samambaia, 20 Jan. 1965, Heringer 10120 (holotype UB), syn. nov.

Shrubs 0.2–1 m tall, sometimes with xylopodium; young twigs pubescent. Leaves with petioles 1.1–3.4 × 1–2.4 mm, canaliculate, glabrous; blades elliptic, 29.7–85.8 × 20.7–38.2 mm, coriaceous, discolorous, glabrous, glandular dots visible on both sides, apex acute; base acute; margin revolute; midvein sulcate adaxially, raised abaxially; lateral veins 11–20 on each side, visible on either side or scarcely visible abaxially; marginal veins 1–1.9 mm from the margin. Inflorescences auxotelic, pedicels 6–10.2 mm long, pubescent; bracteoles concealing the ovary, deltate, 2.7–4.3 × 3.4–

4.9 mm, apex acute, rarely obtuse, often glabrescent, rarely pubescent, ciliate, persistent at anthesis. Buds obpyriform 8.4–10.3 × 5.8–10.8 mm; calyx lobes 4, of equal size, widely ovate, apex obtuse, 5.3–7.5 × 5.3–6.4 mm, glabrescent, ciliate; petals 4, 9–10.3 × 5.1–7, glabrous, not ciliate; ovary ca. 4 × 6 mm, pubescent; style ca. 7 mm long, staminal ring subquadrate. Fruits immature globose, 12–17 mm in diameter, glabrous, 1 seed ca. 8.4 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.

Specimens examined:—**BRAZIL. Minas Gerais:** Uberlândia, *Lenza & Barbosa 207* (HUFU!); idem, *Lenza & Barbosa 74* (HUFU!); idem, *Lenza & Barbosa 52* (HUFU!); idem, *Lenza & Barbosa 25* (HUFU!); idem, *Bordon & Reis s/n* (HUFU 50315!); idem, *Araujo 1267* (BHCb!, HUFU!); idem, *Hattori et al. 16* (BHCb!, HUFU!); idem, *Barbosa 303* (HUFU!); idem, *Lenza 447* (BHCb!, HUFU!). **Goiás:** Ipameri, *Cordovil & Santos 374* (BHCb!); Cristalina, *Hatschbach 43118* (BHCb!, MBM!); idem, *Árbocz 711* (BHCb!, MBM!).

Phenology:—Flowers in May, August and September; fruits from September to December.

Distribution and habitat:—Occurring on the dystrophic soils of the Cerrado from Minas Gerais and Goiás states.

Notes:—*Eugenia glandulosa* is the only species from *Eugenia* sect. *Phyllocalyx* that occurs only in the Cerrado. The species is covered with lots of dots in all organs, which is a important distinguishing feature.

5. *Eugenia involucrata* De Candolle, Prodr. 3: 264. 1828. Type:—BRAZIL. Rio de Janeiro, *Martius s. n.* (lectotype: G!, designated by McVaugh 1956b, Taxon 5: 144). Figure 2A.

≡ *Phyllocalyx involucratus* (DC.) O. Berg, Linnaea 27: 307. 1856; ≡ *Stenocalyx involucratus* (DC.) Kausel, Lilloa 32: 333. 1966.

=*Eugenia aemilii* Barbosa Rodrigues ex Chodat & Hassler, Bull. Herb. Boissier 2,7: 807. 1907. Type:—PARAGUAY. pr. San Estanislao, *Hassler 4157* (lectotype K!, designated by Büniger *et al.* 2015; isolectotypes: NY, photo!, MPU, photo!, MICH, photo!, S!).

=*Eugenia bracteata* Vell., *nom. illeg.* Fl. Flumin. 209. 1829; Icon. 5: Table 40. Type:—BRAZIL. Rio de Janeiro, “habitat ad scaturiginem fluvii dicti Taguahy”, *Vellozo s. n.* (lectotype Fl. Flumin. Icones 5: Table 40, designated by Büniger *et al.* 2015: 999), not *E. bracteata* Richard, Actes Soc. Hist. Nat. Paris 1: 110. 1792.

=*Eugenia cavalcanteana* Mattos, Loefgrenia 94: 1. 1989. ≡ *Phyllocalyx riedelianus* O. Berg, Fl. Bras. 14 (1): 590. 1859, non *Eugenia riedeliana* O. Berg Fl. Bras. 14 (1): 261. 1857. Type:—BRAZIL. Minas Gerais, “in saxosis montis Serra do Caraça prov. Minarum”, *Riedel, s. n.* (holotype: LE 521!).

=*Eugenia calycina* Cambessèdes, Fl. Bras. Merid. 2: 352. 1832. Type:—BRAZIL. prov. Goyazensis, *Saint. Hilaire s. n.* (first-step lectotype P!, designated by Büniger *et al.* 2015: 1000; **second-step lectotype here designated:** P 00723728!, isolectotypes F 065098, P 00723730!; remaining syntypes MPU 11122!, MPU 11123!).

=*Eugenia calystegia* (O. Berg) Niedenzu, Nat. Pflanzenfam. 3. Abt. 7:82. 1893. ≡ *Phyllocalyx calystegius* O. Berg, Fl. Bras. 14 (1): 331. 1857. Type:—BRAZIL. São Paulo, *Sellow s. n.* (holotype B †; lectotype LE 1056!, designated by Büniger *et al.* 2015: 1000).

=*Eugenia chodatii* Barbosa Rodrigues ex Chodat & Hassler, *nom. nud.* Bull. Herb. Boissier 2,7: 807. 1907. Type:—PARAGUAY. in campo Ipê-hu, Sierra de Maracayu, *Hassler 4981* (holotype G!).

=*Eugenia goyazensis* Niedenzu, Nat. Pflanzenfam. 3. Abt. 7: 82. 1893. ≡ *Phyllocalyx regelianus* O. Berg, Fl. Bras. 14 (1): 591. 1859, non *E. regeliana* O. Berg, Fl. Bras. 14 (1): 573. 1859. ≡ *Eugenia lundiana* Kiaerskou, *nom. superfl.*, Enum. Myrt. Bras. 162. 1893. Type:—BRAZIL. Minas Gerais, “in campis inter Rio das Velhas et Paranaíba, prov. Minarum”, *Riedel 2461* (holotype: LE!; isotypes: K!, U!, NY, photo!, F, photo!).

=*Eugenia involucrata* var. *minutifolia* Mattos & D. Legrand, Loefgrenia 67: 30. 1975. Type:—BRAZIL. Santa Catarina, Florianópolis, Ribeirão-Barreto, *Bresolin 217* (holotype: MVM!).

=*Eugenia jaguariaivensis* var. *brevipedunculata* Mattos, Loefgrenia 11: 1. 1963. Type:—BRAZIL. Paraná, Jaguariaiva, *Mattos 10570* (holotype: SP!; isotype: MBM!).

=*Eugenia laevigata* (O. Berg) D. Legrand, Anais Reunião Sul-Amer. Bot. 3: 113. 1938, *nom. illeg.*, non *E. laevigata* De Candolle, Prodr. 3: 283. 1828. ≡ *Phyllocalyx laevigatus* O. Berg, Fl. Bras. 14 (1): 329. 1857. Type:—BRAZIL. *Schott 5834* (holotype: W!; isotype: F, photo!).

=*Eugenia neoformosa* Sobral, Napaea 11: 36. 1995. ≡ *Eugenia formosa* Cambessèdes, Fl. Bras. Merid. 2: 354. 1832, *nom. illeg.*, non Wallich, Pl. Asiat. Rar. 2: 6. 1830. ≡ *Phyllocalyx formosus* (Cambess.) O. Berg, Linnaea 27: 307. 1856. Type:—BRAZIL. Serra de Curumatay, *Laruotte s.n.* (first-step lectotype designated by Sobral, 1991: P!; **second-step lectotype here designated:** P 00723735!; isolectotypes F 0065172F!, P 00723736!, P 00723737!).

=*Eugenia pallescens* Kiaerskou, Enum. Myrt. Bras. 162. 1893. Type:—BRAZIL. *Glaziou 9446* (holotype: C!).

=*Eugenia paraguayensis* Barbosa Rodrigues ex Chodat & Hassler, Bull. Herb. Boissier 2,7: 807. 1907, *nom. nud.* Type:—PARAGUAY. prov. Atira, *Hassler 3688* (holotype: G!).

=*Eugenia stricta* (O. Berg) Kiaerskou, Enum. Myrt. Bras. 163. 1893. ≡ *Phyllocalyx strictus* O. Berg, Fl. Bras. 14 (1): 330. 1857. ≡ *Eugenia strictissima* Govaerts, World Checkl. Myrtaceae: 166. 2008. Type:—URUGUAY. “ad ripas fluminis Rio Pardo in Montevideo”,

Sellow 257 (holotype B f; lectotype K!, designated by Büniger *et al.* 2015: 1000; isolectotypes: U!, BR!, BM!, F, photo!), not *Eugenia stricta* Pancher ex Brongniart & Gris, Bull. Soc. Bot. France 12: 179. 1865.

=*Eugenia suffrutescens* Niedenzu, Nat. Pflanzenfam. 7: 82. 1893. ≡ *Phyllocalyx herbaceus* O. Berg, Fl. Bras. 14 (1): 328. 1857. ≡ *Eugenia jaguariaivensis* Mattos, Lofegrenia 11: 1, 2. 1963. ≡ *Eugenia calycina* var. *herbacea* (O.Berg) Mattos, Lofegrenia 113: 2. 1999. Type:—BRAZIL. Rio Grande do Sul, “habitat in campis”, Sellow *s. n.* (holotype B f; lectotype K!, designated by Büniger *et al.* 2015: 1000; isolectotypes BR!, U!).

=*Myrtus aggregata* Vellozo, Fl. Flumin. 215. 1829; Icon. 5: Table 65. ≡ *Phyllocalyx cerasiflorus* O. Berg, Linnaea 27: 308. 1856, *nom. illeg.* ≡ *Eugenia aggregata* (Vell.) Kiaerskou, Enum. Myrt. Bras. 162. 1893. Type:—BRAZIL. “habitat in prov. Rio de Janeiro”, Vellozo *s/n* (lectotype Fl. Flumin. Icones 5: Table 65, designated by Büniger *et al.* 2015: 1001.).



FIGURE 2 A) *Eugenia involucrata* (Mendes, D. *et al.* 1086 BHC B, HUFU) B) *E. itacarensis* (Fiaschi *et al.* 2166 CEPEC), C) *E. luschnathiana* (Matos *et al.* *s/n* BHC B 164438, EAC 16797), D) *E. macrobracteolata* (Farrag, P. R. 181 BHC B, RB).

Sub-shrubs, shrubs, treelets or trees 0.1–25 m tall; entirely glabrous or young twigs pubescent. Leaves with petioles 2.9–6.2 × 0.6–1.8 mm, canaliculated, glabrous; blades elliptic, obovate or oblong, 15–100 × 6–70 mm, coriaceous, chartaceous, or membranaceous, discolorous, glabrous, glandular dots scarcely visible adaxially, visible abaxially; apex acuminate or rostrate; base acute or cuneate; margin plane; midvein sulcate adaxially, raised abaxially; lateral veins 16–20 on each side, scarcely visible on both sides; marginal veins ca. 1 mm from the margin. Inflorescences auxotelic, pedicels 15–30 mm long, pubescent; bracteoles concealing the ovary, elliptic or deltate, 7–15 × 5.5–12 mm, apex acute or obtuse, pubescent, not ciliate, persistent at anthesis. Buds obpyriform, 8–10 mm × 4–6.8 mm; calyx lobes 4, lanceolate, of equal size, 7–15 × 3.3–4.9 mm, glabrous, not ciliate; petals 4, 8.5–15.5 × 6.8–7.5 mm, glabrous,

not ciliate; ovary 3.8–5.4 × 2.5–3.1 mm, glabrous, style ca. 8.6 mm long, staminal ring subquadrate. Fruits ellipsoid 100–400 mm long, 10–15 mm in diameter, glabrous, 1–2 seed ca. 7 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.

Specimens examined:—**ARGENTINA.** Misiones, *Renvoize 3189* (HUEFS!). **BOLIVIA.** Santa Cruz, *Steinbach s/n* (G 8435!). **BRAZIL.** Bahia: Jussari, *Fiaschi et al. 1943* (BHCBI!). Espírito Santo: Alfredo Chaves, *Hatschbach & Silva 61169* (MBM!). Goiás: Aparecida de Goiânia, *Pastore, 83* (HUEFS!). Minas Gerais: Belo Horizonte, *Mello Barreto 7310* (BHCBI!); idem, *Mello Barreto 7314* (BHCBI!); Caeté, *Koczicki 292* (BHCBI!); idem, *Braga & Grandi 1908* (BHCBI!); Catas Altas, *Mota 2706* (BHCBI!); idem, *Mota 894* (BHCBI!); Diamantina, *Stehmann. 2688* (BHCBI!); idem, *Rocha et al. 80* (HUFU!); idem, *Costa et al. 119* (HUFU!); Fervedouro, *Leoni 2655* (BHCBI!); Lima Duarte, *Andrade et al. 1033* (BHCBI!); Nova Lima, *Andrade 1424* (BHCBI!); idem, *Andrade 1411* (BHCBI!); idem, *Versieux 84* (BHCBI!); Vespasiano, *Rezende 3104* (BHCBI!); Paraíso, *França. 145 & Stehmann* (BHCBI!); Perdizes, *Martens s.n.* (BHCBI 105077!); idem, *Tameirão Neto 1379 & Werneck* (BHCBI!); idem, *Mendes et al. 1086* (HUFU!); idem, *Mendes et al. 739* (HUFU!); idem, *Amorim et al. 236* (HUFU!); idem, *Hattori et al. 37* (HUFU!); idem, *Tameirão Neto 1378 & Werneck*, (BHCBI!); Rio Preto, *Grandi et al. 2689* (BHCBI!); Prados, *Sobral 13417* (HUFU!); Ribeirão das Neves, *Rezende et al. 2216* (BHCBI!); Rio Acima, *Carmo 1457* (BHCBI!); idem, *Carmo 1243* (BHCBI!); idem, *Romero et al. 7151* (HUFU!); Romaria, *Hatschbach et al. 73426* (BHCBI!); Turmalina, *Flores et al. 838* (ESA!); Uberaba, *Teixeira & Brina s.n.* (BHCBI36062!); Prata, *Mota Jr s.n.* (BHCBI 48632!); Uberlândia, *Arantes 335 & Brito* (HUFU!); idem, *Arantes 690* (HUFU!); idem, *Bünger 551* (BHCBI!); idem, *Araújo 2753* (HUFU!); idem, *Kususs s.n.* (BHCBI 164460!); idem, *Silva s.n.* (BHCBI 164473!); idem, *Silva s.n.* (HUFU 50448!); idem, *Volpi et al. 10* (HUFU!); idem, *Fleury-Silva & Halton 160* (HUFU!). São Paulo: Campinas, *Bertoni & Geremias 266* (BHCBI!); idem, *Bertoni & Geremias 641* (BHCBI!); idem, *Bertoni & Geremias 323* (BHCBI!); Jundiá, *Mattos s.n.* (FLOR 39988!). Paraná: Cantagalo *Hatschbach & Silva 55771* (FLOR!); Curitiba, *Kummrow 2314* (FLOR!); Guaraqueçaba *Hatschbach et al. 72722* (BHCBI!); Londrina, *Estevan et al. 153* (BHCBI!). Santa Catarina: Alfredo Wagner, *Falkenberg & Andrade 3474* (FLOR!); idem, *Falkenberg & Andrade 3477* (FLOR!); idem, *Falkenberg & Andrade 3480* (FLOR!); Rio do Sul, *Sevegnani s.n.* (FURB 17827!); Caçador, *Reitz & Klein 13797* (FLOR!); Florianópolis, *Mattos 32743* (FLOR!); Garopaba *Klein & Bresolin 8847* (FLOR!); Itajaí, *Klein 8416* (FLOR!); Ituporanga, *Korte & Kniess 1296* (FURB!); Jabora, *Smith & Reitz 12957* (FLOR!); Paulo Lopes, *Bresolin 968* (FLOR!); Palhoça, *Klein & Bresolin 9830* (FLOR!); Santo Antônio de Lisboa, *Queiroz 567* (FLOR!); São João do Oeste, *Adenesky s.n.* (FURB 4551!); São José, *Reitz & Klein 4168* (FLOR!); Urussanga, *Reitz & Klein 7528* (FLOR!). Rio Grande do Sul: Capão do Leão, *Jarenkow & Bordignon 994* (FLOR!); Vale do Sol, *Jarenkow 2154* (FLOR!). PARAGUAY: Dep. Cazaapá, *Arbo et al. 2836* (G!); idem, *Zardini et al. 2913* (G!); Guayra, *Zardini & Velásques 14225* (G!); Sierra de Amambay, *Hassler 11396* (K!, G!); Pedro Juan Caballero, *Gomes 1475* (BHCBI!).

Phenology:—Flowers in August, September, December and February; fruits in September, October, December and March.

Distribution and habitat:—It is the most widespread species growing in the Cerrado vegetation from Bolivia and Brazil (Goiás, Minas Gerais and São Paulo) and in the Atlantic Forest from Paraguay, Argentina, Uruguay and Brazil (from Rio Grande do Sul to Bahia).

Notes:—Because *Eugenia involucrata* is the most widespread species of *Eugenia* sect. *Phyllocalyx* it may be as well the most morphologically variable species. Morphometric results from Bünger *et al.* (2015) show that the species is highly variable and could be a species complex which can be conveniently assessed through population genetics investigation. *Eugenia involucrata* is the type of the section and is characterized by the black-vinaceous elliptic fruits commonly known as “cereja-do-mato”, “pitanga-preta”, “la cereza de Rio Grande” and “cerella”.

6. *Eugenia itacarensis* Mattos, *Loefgrenia* 62: 3 1974. Type:—BRAZIL: Bahia: Itacaré, mata costeira, 5 Jan. 1967, *Belém, R. P. & Pinheiro, R. S. 2971* (holotype: HB, not found; isotype CEPEC 3950!). **Figure 2B.**

Tree 3–12 m tall; glabrous; young leaves pubescent. Leaves with petioles 12–25 × 2–5 mm, canaliculate, glabrous; blades elliptic or narrow elliptic, 134.5–152 × 11–38 mm, coriaceous, discolourous, glabrous, glandular dots scarcely visible on both sides, apex acute or acuminate; base attenuate; margin revolute; midvein sulcate adaxially, raised abaxially; lateral veins 19–25 on each side, visible on either side; marginal vein 4–7 mm from the margin. Inflorescences auxotelic, pedicels 12–30 mm long, glabrous; bracteoles concealing the ovary, deltate, 17–34 × 9–20 mm, apex acute, pubescent, not ciliate, persistent at anthesis. Buds globose ca. 26 × 17 mm; calyx lobes 4, of equal size, ovate, apex acute, 12–21 × 9–15 mm, pubescent, not ciliate; petals 4, ca. 10 × 8 mm, glabrous, not ciliate; ovary ca. 8 × 4 mm, pubescent; style ca. 12 mm long, staminal ring subquadrate. Fruits globose, ca. 12 mm in diameter, sparsely pubescent, 1 seed ca. 9 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.

Specimens examined:—**BRAZIL. Bahia:** *Mattos & dos Santos* (CEPEC 38184!); Ilhéus, *Thomas et al.* 9010 (CEPEC!, RB!); Itamarajú, *Pinheiro 1791* (CEPEC!); Ubatã, *Pinheiro s/n* (CEPEC 9013!); Una, *Jardim et al. s/n* (CEPEC 81985!); Valença, *Fiaschi et al. 2166* (CEPEC!); Uruçuca, *Mattos-Silva 5179* (CEPEC!).

Phenology:—Flowers in January, February, March and July; fruits in August.

Distribution and habitat:—Occurring only in the coastal Atlantic forest in southern Bahia.

Notes:—The species is recognized by its larger blades (> 100 mm long) and flowers, as *E. regia* and *E. ruschiana*, but differs from *E. ruschiana* by its larger bracteoles (> 13 mm long *versus* < 13 mm long) and glabrous blades from *E. regia*. It is a threatened species under EN category (IUCN 2015).

7. *Eugenia luschnathiana* (O.Berg) Klotzsch ex B.D. Jackson, *Index Kewensis* 1: 908. 1893. Type:—**BRAZIL:** *Habitat ad Cruz de Cosma in prov. Bahiensis, Luschnath 152* (holotype: B f, **lectotype here designated** BR 526236!, isotype LE 0004101!, W). **Figure 2C.**

≡ *Phyllocalyx luschnathianus* O. Berg, *Fl. Bras.* 14 (1): 333. 1857. ≡ *Eugenia luschnathiana* Klotzsch, *nom. nudum sine diagn.*; ≡ *Eugenia lucescens* Niedenzu in *Nat. Pflanzenfam.* 3, Abt. 7: 82. 1983, *nom. illeg.*

= *Eugenia duckeana* Mattos, *Loefgrenia* 28: 1. 1968. Type:—**BRAZIL:** Ceará: Fortaleza, Barra do Coco, 26 February 1955, *Ducke 2401* (holotype EAC; isotype BHCBI).

Shrubs or treelets 2–5 m tall; young twigs pubescent, sometimes yellow-pubescent or whitish-lanose over the young leaves. Leaves with petioles 2.6–8.75 × 1–1.6 mm, canaliculate, glabrous; blades elliptic or narrow elliptic, 45–75 × 11–30 mm, coriaceous, discolorous, adaxially glabrescent, sometimes the abaxial side with yellow trichomes on the midvein, glandular dots visible on both sides, apex acuminate; base attenuate; margin revolute; midvein sulcate adaxially, raised abaxially; lateral veins 9–13 on each side, scarcely or not visible on either side, sometimes visible adaxially; marginal vein 1.5–2.1 from the margin. Inflorescences auxotelic, pedicels 8–16 mm long, yellow-pubescent; bracteoles concealing the ovary, elliptic, 4.8–5.9 × 1.8–3 mm, apex acute, pubescent, not ciliate, persistent at anthesis. Buds globose 6.2–8.3 × 5.3–9.1 mm; calyx lobes 4, of equal size, ovate, apex acute, 5.8–12.7 × 2.6–7.4 mm, pubescent, not ciliate; petals 4, 6.7–13.5 × 6.8–12.3, glabrous, not ciliate; ovary ca. 4 × 5 mm in diameter, pubescent; style 5–6 mm long, staminal ring subquadrate. Fruits globose, 9.5–11.5 mm in diameter, sparsely pubescent, 1 seed ca. 9 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.

Specimens examined:—**BRAZIL. Bahia:** Ilhéus, *Riedel s/n* (K000018754!); Cruz do Cosma, *Glocker s/n* (K001018406!); Salvador, *Pereira Pinto 25/87* (FLOR!). **Ceará:** Aquiraz, *Eliana et al s/n* (EAC/BHCBI 16797!); Beberibe, *Filho s/n* (BHCBI 26083!); Caucaia, *Castro 1722* (EAC!, BHCBI!); idem, *Castro* (EAC 32483!); Fortaleza, *Castro 1674* (EAC!); São Gonçalo do Amarante, *Souza et al. 305* (EAC!); idem *Ferreira 116* (EAC!); Distrito do Pecém, *Ferreira s/n* (EAC 48925!). **Pernambuco:** Recife, *Silva 131* (HUEFS!). **Rio Grande do Norte:** Extremoz, *Silva. s/n* (UFRN 1185!); idem *Silva s/n* (UFRN 1454!); Natal, *Silva, J.O.N. 42* (HUEFS); idem *Silva s/n* (UFRN 10594!); idem, *Jardim 5655* (UFRN!); idem, *Oliveira 800* (UFRN!); São José de Mipibu, *Cestaro 99-0218* (UFRN 5062!); idem, *Araújo s/n* (UFRN 10088!).

Phenology:—Flowers in September, October, November and April; fruits in October, November, and December.

Distribution and habitat:—Occurring on the *restingas* from the northeastern States of Brazil (from Paraíba to Ceará). The specimens founded in Minas Gerais and Rio de Janeiro states are cultivated.

Notes:—This is the only species restricted to northeast Brazil and it is easily distinguished by its yellowish trichomes along the blades, pedicels and flowers.

8. *Eugenia macrobracteolata* Mattos, *Loefgrenia* 64: 5. 1975. Type:—**BRAZIL:** Paraná: Guaratuba, Pedra Branca de Araraquara, 150 m, 13 Nov. 1965, *Hatschbach 13391* (holotype HB, not found; **lectotype here designated**, MBM!; isotypes NY, MO, UPCBI!). **Figure 2D.**

= *Eugenia leonanii* Mattos, *Loefgrenia* 94: 5. 1989. Type:—**BRAZIL:** São Paulo: Paranapiacaba (via Férrea São Paulo-Santos), na Estação Biológica, 27 Jan. 1970, *Santana, J. s.n.* (holotype HAS), *syn. nov.*

Shrubs or treelets 2–5 m tall; young twigs pubescent. Leaves with petioles 6 × 9 mm long, canaliculate, glabrous; blades obovate, 15–100 × 60–70 mm, chartaceous, discolorous, scarcely pubescent on both sides, glandular dots scarcely visible on both sides; apex shortly acuminate; base attenuate; margin slightly revolute or revolute; midvein

sulcate adaxially, raised abaxially; lateral veins 11–13 on each side, visible on both sides; marginal vein ca. 2 mm from the margin. Inflorescences auxotelic, pedicels 3.5–4 mm long, glabrous; bracteoles concealing the ovary, widely ovate, 15–24 × 10–20 mm, apex acute or obtuse, glabrous, not ciliate, persistent at anthesis. Buds globose, ca. 10.4 mm × 10 mm; calyx lobes 4, deltate or elliptic, of equal size, 15.4–28 × 7.8–16 mm, glabrescent on both sides, not ciliate; petals 4, 9–16.2 × 9–13.3 mm, glabrous, not ciliate; ovary ca. 5 × 9 mm, whitish-tomentose or strigose, style ca. 10 mm long, staminal ring subquadrate. Fruits globose, 13–44 mm in diameter, glabrous, 1–4 seeds ca. 14.6 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.

Specimens examined:—**BRAZIL.** *Glaziou 19353* (LE!), *Glaziou 16987* (BR!, G!). **Espírito Santo:** Cariacica, *Paixão et al. 1854* (BHCB!, RB!). **São Paulo:** Itanhaém, *Garcia 971* (ESA!, UEC!); Paranapiacaba, *Sugiyama & Lopes 560* (BHCB!); Santo André, *Benedito 28* (BHCB!); São Luís do Paraitinga, *Russel & Guilherme 185* (HRCB!).

Phenology:—Flowers and fruits in November and December.

Distribution and habitat:—Occurring on the coastal Atlantic forest from Paraná to Espírito Santo states (Brazil).

Notes:—*Eugenia macrobracteolata* is apparently related with *E. involucrata* but differs by the larger flowers (calyx lobes > 15 mm long versus < 15 mm long) and the shape of the fruits (globose in *E. macrobracteolata* versus elliptic in *E. involucrata*). When Mattos described *Eugenia macrobracteolata* (1975), he had not seen the fruits. Later (1989), he published a new species under the name *Eugenia leonanii* but it was described only with fruits. Looking at the two morphological descriptions, the types and the additional specimens examined we concluded that these two species are in fact only one and the accepted name is *Eugenia macrobracteolata*.

9. *Eugenia magnibracteolata* Mattos & D. Legrand, *Loefgrenia* 67: 8. 1975. Type:—**BRAZIL:** Paraná: Guaraqueçaba, Serrinha, 100 m, 5 Jul. 1967, *Hatschbach 16675* (holotype MVM; isotypes MBM 13391!, ICN, MO). **Figure 3A.**

Trees 3–5 m tall; young twigs reddish-brown pubescent. Leaves with petioles 5 × 7 mm long, canaliculate, glabrous; blades elliptic or narrowly elliptic, 120–190 × 45–65 mm, chartaceous, discolorous, glabrous on both sides, glandular dots scarcely visible on both sides; apex acuminate; base obtuse or cuneate; margin revolute; midvein sulcate adaxially, raised abaxially; lateral veins 10–17 on each side, raised on both sides; marginal veins 2, the inner ca. 7 mm from the margin, the outermost up to 4 mm. Inflorescences auxotelic, pedicels 5–7 mm long, pubescent; bracteoles concealing the ovary, suborbiculate, 8–10 × 4–5 mm, apex acute, obtuse or rounded, glabrescent, not ciliate, persistent at anthesis. Buds obpyriform, 10–15 mm × 7–11 mm; calyx lobes 4, ovate, of equal size, 7–10 × 9–14 mm, glabrescent on both sides, not ciliate; petals 4, ca. 9 × 6 mm; ovary ca. 5.5 × 7.5 mm, rusty-pubescent, style ca. 15 mm long, staminal ring subquadrate. Fruits globose or elliptic, 10.2–12.6 mm in diameter, tomentose or lepidote to glabrous, 1 seed ca. 9 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.

Specimens examined:—**BRAZIL. São Paulo:** Cubatão, *Lemos s/n.* (SP 26725!); *Bünger & Moura-Júnior 627* (BHCB!); Sete Barras, *Kawasaki 655* (MBM!, SP!). **Paraná:** Guaraqueçaba, *Cervi et al. 7051* (BHCB!, MBM!).

Phenology:—Flowers in August and October; fruits in October.

Distribution and habitat:—Occurring on the coastal Atlantic forest from Paraná and São Paulo states (Brazil).

Notes:—*Eugenia magnibracteolata* is characterized by its blades chartaceous with lateral veins raised on both sides and apex acuminate, inflorescence most terminal and fruits tomentose or lepidote.

10. *Eugenia magnisepala* Bünger & Mazine, *Kew Bulletin* 73: 38. 2018. Type:—**BRAZIL.** Bahia, Maracás, 13° 28' S, 40° 24' W, 15 Feb. 2004, (fl.) *Moraes, M. V. 600* (BHCB!; HUEFS). **Figure 3B.**

Shrubs; young twigs glabrous. Leaves with petioles 3.7–5.8 × 0.5–0.82 mm, canaliculate, pubescent; blades elliptic, 42–45 × 15.6–20.6 mm, membranaceous, discoloured, pubescent on both sides, glandular dots not visible on both sides, apex acute; base attenuate; margin plane, slightly revolute; midvein sulcate adaxially, raised abaxially; lateral veins ca. 15 on each side, not visible on either side; marginal vein ca. 0.8 mm from the margin. Inflorescences auxotelic, pedicels 8.3–13.7 mm long, pubescent; bracteoles concealing the ovary, deltate, 6.9–16.4 × 6.2–13.9 mm, apex acute, pubescent, not ciliate, persistent at anthesis. Buds obpyriform 9.1–14 × 7.4–11.3 mm; calyx lobes 4, of equal size, elliptic, apex acute, 12.4–19.8 × 5.3–9.2 mm, pubescent, not ciliate; petals 4, 11–13.8 × 8.9–10.2 mm, glabrous, not ciliate; ovary 4.5–5.7 × 2–4 mm, costate, tomentose; style 9–12 mm long, staminal ring subquadrate. Fruits not seen.

Phenology:—Flowers in February.

Distribution and habitat:—Occurring in the peculiar region of *Caatinga-Cerrado-Atlantic forest* transition in the municipality of Maracás in the Bahia State (Brazil).

Notes:—*Eugenia magnisepala* resembles morphologically similar populations of *E. involucrata* growing in dry areas and presenting smaller leaf blades. The new species has larger calyx lobes (12.4–19.8 mm long vs 7–15 × 3.3–4.9 mm long). *Eugenia* sect. *Phyllocalyx* species with larger calyx lobes are *E. itacarensis*, *E. macrobracteolata* and *E. regia*, but these species have significantly larger blades (more than 50 mm long vs 15–20 mm long in *E. magnisepala*). Another significant morphological trait is the costate ovary of *E. magnisepala*. Among species of section *Phyllocalyx*, only *E. selloi* has a costate ovary but this species is restricted to the restingas of Rio de Janeiro State and has smaller calyx lobes (3.4–4.2 mm long vs 12.4–19.8 mm long).

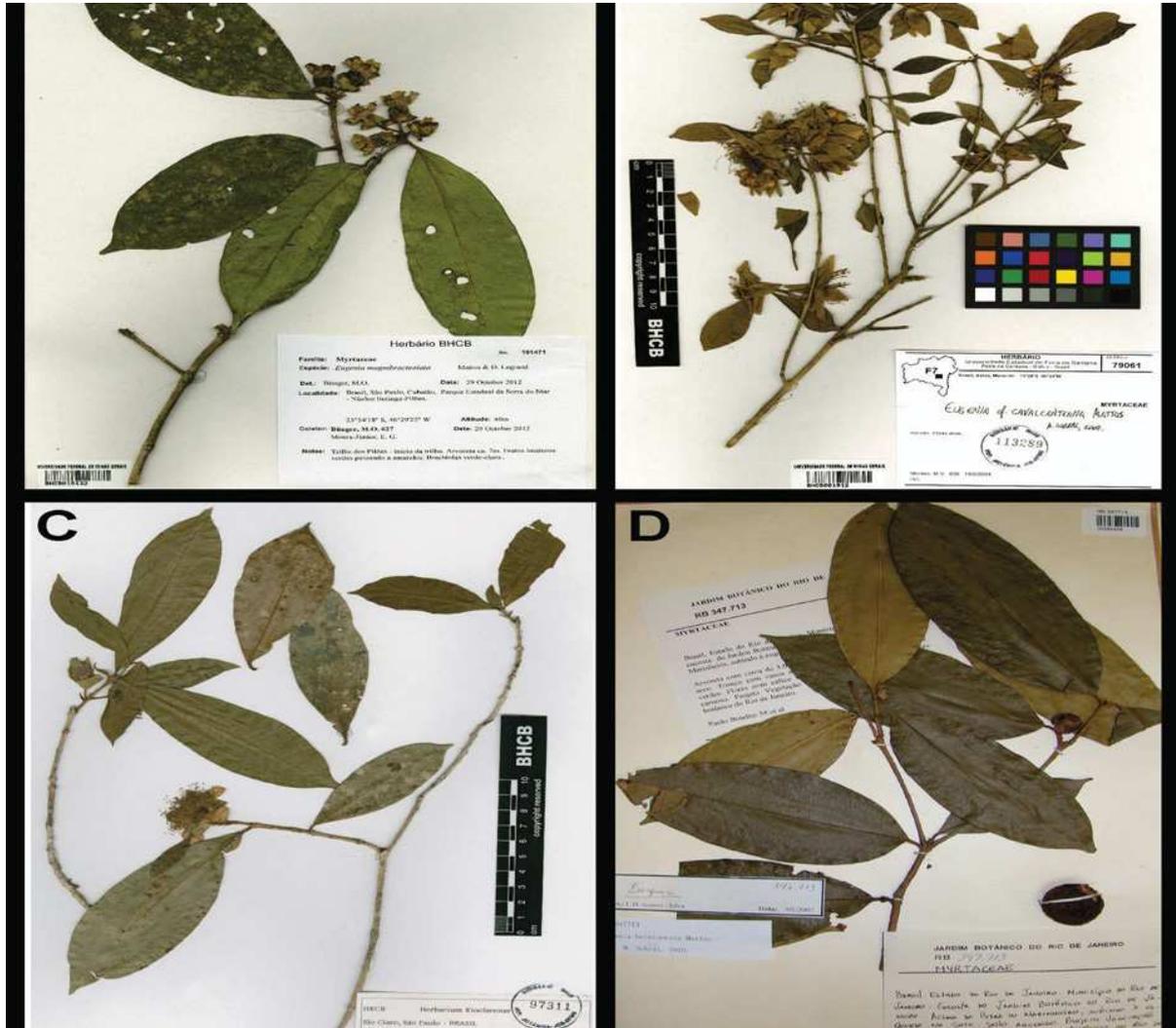


FIGURE 3 A) *Eugenia magnibracteolata* (Bünger, M. O. & Moura-Júnior, E. G. 627 BHCb), B) *E. magnisepala* (Moraes, M.V. 600 BHCb, HUEFS), C) *E. membranifolia* (Galletti 1467 BHCb, HRCb), D) *E. puberula* (Botelho *et al.* 34 RB).

11. *Eugenia membranifolia* Niedenzu, *Natürl. Pflanzenfam.* 3 (7): 82. 1893. Type:—Brazil, “habitat ad urbem Rio de Janeiro”, *Gaudichaud* 762 (holotype B f; **lectotype here designated:** P 05157049!; isolectotype F!). **Figure 3C.**

≡ *Phyllocalyx membranaceus* O. Berg, *Fl. Bras.* 14 (1): 334. 1857, non *Eugenia membranacea* O. Berg (1859: 589).

Shrubs, treelets or trees 1.5–10 m tall; glabrous. Leaves with petioles 5–7 × 1–2 mm, canaliculate, glabrous; blades elliptic, lanceolate or oblanceolate, 80–200 × 25–65 mm, coriaceous, discolorous, glabrous on both sides, glandular dots visible on both sides; apex acuminate; base obtuse or attenuate, margin revolute; midvein sulcate adaxially, raised abaxially; lateral veins 15–30 on each side, raised on both sides; marginal veins 2, the inner one 2–4 mm from the margin, the outer one ca. 1 mm from the margin. Inflorescences axotelic, pedicels 3–13 mm long, glabrous, rarely puberulent; bracteoles concealing the ovary, deltate, 4–13 × 7–10 mm, apex acute, glabrous or puberulent, ciliate, persistent at anthesis. Buds obpyriform, 5–13 × 4–15 mm; calyx lobes 4, ovate, of equal size, 5–15 × 5.8–9 mm, glabrous, ciliate; petals 4, 11–14 × 9.5–11 mm, glabrous, ciliate or not; ovary ca. 5 × 8 mm, pubescent, eventually

glabrescent, style ca. 10 mm long, staminal ring subquadrate. Fruits globose or elliptic, 15.2–36 mm in diameter, tomentose or lepidote to glabrous, 1– seed ca. 17 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.

Specimens examined:—**BRAZIL. Paraná:** Guaraqueçaba, *Hatschbach 56137* (ICN!, MBM!); Batuva, *Hatschbach. & Silva 56137* (BR!, MBM!). **São Paulo:** Cananéia, *Camargo et al. 353* (BHCB!, UEC!); idem, *Urbanetz et al. 329* (BHCB!, UEC!); idem, *Urbanetz et al. 347* (BHCB!, UEC!); idem, *Castro 94* (BHCB!, HRCB!); Sete Barras *Kawasaki et al. 652* (HRCB!, MBM!); idem, *Almeida-Scabbia 1186* (BHCB!, HRCB!); idem, *Galetti 1467* (BHCB!, HRCB!); idem *Costa, & Andrade 522* (BHCB!, UEC!); Iguape, *Anunciação et al. 25* (BHCB!, SP!); idem, *Mamede, et al. 482* (BHCB, SP); idem, *Cordeiro, I. et al. 1622* (BHCB!, SP!); idem, *Catharino et al. 1563* (BHCB!, SP!); idem, *Anunciação et al. 783* (SP!); idem, *Anunciação et al. 568* (BHCB!, SP!); idem, *Rossi, et al. 1266* (SP!); idem, *Mamede et al. 236* (BHCB!, SP!); idem, *Gomes da Silva et al. 130* (BHCB!, SP!); idem, *Mamede et al. 488* (BHCB!, SP!); idem, *Garcia 658* (BHCB!, HRCB!).

Phenology:—Flowers in January, August, October and December; fruits in January, February, April and October.

Distribution and habitat:—Occurring on the coastal Atlantic forest from Paraná and São Paulo States (Brazil) from the sea level to ca. 300 m elev.

Notes:—*Eugenia membranifolia* is similar to *E. puberula* and was for a long time identified as it. Bünge *et al.* (2014b) provide further discussion about the history of this name. The species differs from *E. puberula* by its blades with apex acuminate (*versus* frequently caudate) and ovary pubescent, often glabrescent (*versus* whitish-villose).

12. *Eugenia puberula* Niedenzu, *Natürlichen Pflanzenfamilien* 3, Abt. 7: 83. 1893. Type:—**BRAZIL. Habitat in silvis montii Corcovado prope urbem Rio de Janeiro, florebat Augusto: Riedel et Langsdorff** (holotype LE, photo; isotype P 05321833!). **Figure 3D.**

≡ *Phyllocalyx pubescens* O. Berg, *Flora Brasiliensis* 14 (1): 592. 1859.

= *Eugenia tomentosa* Cambessèdes, *Flora Brasiliae Meridionalis* 2(19): 353. 1832, non Aublet (1775: 504), *nom. illeg.* ≡ *Phyllocalyx tomentosus* O. Berg, *Flora Brasiliensis* 14 (1): 328. 1859. Type:—**BRAZIL. Habitat prope urbem Rio de Janeiro: Saint-Hilaire** (holotype P 00076014!; isotype MPU, photo!)

= *Eugenia bocainensis* Mattos, *Loefgrenia* 64: 4. 1975. ≡ *Phyllocalyx ligustrinus* O. Berg, *Flora Brasiliensis* 14 (1): 592. 1859, non *Eugenia ligustrina* (Swartz) Willdenow (1799: 962). Type:—**BRAZIL. Habitat in Brasilia, loco natali non addito: Riedel et Langsdorff** (holotype LE [photo!]; isotypes BR 526034!, K 000170016!).

Shrubs or treelets 3–5 m tall; young twigs glabrous. Leaves with petioles 6–14.5 × 1.1–2.6 mm, canaliculate, glabrous; blades elliptic, narrow elliptic or ovate, 63–160 × 20–58 mm, coriaceous, discolorous, glabrous, glandular dots scarcely visible on both sides, apex frequently caudate or acuminate; base attenuate, sometimes acute; margin plane or faintly revolute; midvein sulcate adaxially, raised abaxially; lateral veins 18–40 on each side, visible or scarcely visible on either side; marginal veins 2, the inner one 1.6–3.5 mm from the margin, the outer one 0.7–0.8 mm. Inflorescences auxotelic, terminal, pedicels 3.3–5.8 mm long, glabrescent; bracteoles concealing the ovary, elliptic or ovate, 2.9–8.3 × 1.8–2.1 mm, apex acute, glabrous, ciliate, persistent at anthesis. Buds globose 7.1–9.8 × 5.6–8.3 mm; calyx lobes 4, of equal size, deltate, apex frequently obtuse or rarely acute, 4.4–8.6 × 3.9–7.7 mm, glabrescent or glabrous, ciliate; petals 4, 8.5–9.5 × 3.6–8, glabrous, not ciliate; ovary ca. 5 × 6 mm in diameter, whitish-villose; style 5.8–6.5 mm long, staminal ring quadrate. Fruits immature globose, 5.7–10.8 mm in diameter, whitish-pubescent or whitish-villose, 1 seed ca. 7 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.

Specimens examined:—**BRAZIL. Espírito Santo:** Linhares, *Silva 003/78* (CVRD, RB!). **Rio de Janeiro:** [Estado da Guanabara], *Sucre 7966* (RB!); idem, *Sucre 7480* (RB!); Itatiaia, *Campos Porto 810* (RB!); Rio de Janeiro, *Bünge & Souza 629* (BHCB!); idem, *Pessoal do Horto Florestal s/n* (RB 4100!); idem, *Botelho, P. et al. 34* (RB!); Nova Friburgo, *Martinelli et al. 11941* (BHCB!, RB!); idem, *Martinelli et al. 11731* (RB!).

Phenology:—Flowers in October and November; fruits in October and December.

Distribution and habitat:—Occurring on the coastal Atlantic forest from Rio de Janeiro to Maranhão States (Brazil). Occasionally occurring on higher altitudes over 600 m elev. in the Macaé de Cima, Rio de Janeiro State (Brazil).

Notes:—*Eugenia puberula* has its blades with apex more frequently caudate, calyx lobes frequently obtuse and a whitish-villose ovary as important features to distinguish it from other *Eugenia* sect. *Phyllocalyx* species.

13. *Eugenia regia* Bunger & Sobral, *Phytotaxa* 147 (2): 55. 2013. Type:—BRAZIL. Sao Paulo, Ubatuba, no alto do Morro Escuro, a 800m do Rio Escuro, 7 November 1961 (fl, fr), *Fontella & Moura 94* (holotype SP!). **Figure 4A.**

Tree 3–8 m tall; young twigs pubescent. Leaves with petioles 11 × 25 mm long, canaliculate, pubescent; blades oblong, 150–300 × 65–120 mm, coriaceous, discoloured, floccose, glandular dots scarcely visible on both sides; apex acuminate or obtuse; base acute; margin revolute; midvein sulcate adaxially, raised abaxially; lateral veins 25–40 on each side, raised on both sides; marginal veins 2, the inner one 4.6–7 mm from the margin, the outer one up to 2.5 mm. Inflorescences auxotelic, pedicels 13–28 mm long, pubescent; bracteoles concealing the ovary, deltate, 20–28 × 15–20 mm, apex acute, pubescent, not ciliate, persistent at anthesis. Buds obpyriform, 8–13 mm × 7–10 mm; calyx lobes 4, ovate or lanceolate, of equal size, 15–25 × 8–12 mm, tomentose, not ciliate; petals 4, ca. 18 × 9 mm, pubescent, glabrescent, not ciliate; ovary 7–9 × 7–10 mm, pubescent, style ca. 7–11 mm long, staminal ring subquadrate. Immature fruits globose, 11–16.8 mm diam, pubescent, 1 seed ca. 13 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.

Specimens examined:—BRAZIL. **Rio de Janeiro:** Paraty, *Klein et al. 1048* (BHCB!, RB!); idem, *Giordano et al. 2050* (BHCB!, RB!); idem, *Barros 2877* (BHCB!, SP!). **Sao Paulo:** Ubatuba, *Melo et al. 2556* (BHCB!, HUEFS!); Picinguaba, *Takahashi & Bencke 179* (HRCB!); idem, *Sanchez & Pedroni 42* (HRCB!); idem, *Furlan et al. 919* (HRCB!); idem, *Assis et al. 467* (HRCB!).

Phenology:—Flowers and fruits in November.

Distribution and habitat:—Occurring on the coastal Atlantic forest from north Sao Paulo to south Rio de Janeiro States (Brazil) at ca. 100 m elev.

Notes:—*E. regia* is frequently filed in herbaria under the name *Eugenia santensis* Kiaerskou (1893: 163), a synonym of *Eugenia bunchosiifolia* (a species of *Eugenia* sect. *Speciosae*) However, these species are distinguished through larger bracteoles (20–28 mm long *versus* ca. 4 mm long), larger calyx lobes (15–25 mm long *versus* up to 10 mm long.) and blades floccose (*versus* glabrous).

14. *Eugenia ruschiana* Bunger & Mazine, *Phytotaxa* 266(1): 40. 2016. Type:—BRAZIL. Espırito Santo, Santa Teresa, Reserva Biologica Augusto Ruschi, estrada entre a sede e a represa da divisa com area residencial. 19° 54' 23" S, 40° 33' 35" W, 789m, 04 Oct. 2012, (fl.) *Bunger, M.O.; Rezende, V.L.; Oliveira, C.T. & Heiden, G.* 618 (holotype BHCB!; isotype K!). **Figure 4B.**

Treelets to 5 m; mature twigs subquadrate, glabrous. Leaves with petioles 13–16 × 2.5–3 mm, pubescent, canaliculate; blades oblong, 175–195 × 41–65 mm, coriaceous, discoloured, glabrous, trichomes on the midvein, glandular dots not visible adaxially, scarcely visible abaxially; apex acuminate; base acute or attenuate; margin plane; midvein sulcate adaxially, raised abaxially; lateral veins 18–30 on each side, visible on both sides; marginal veins two, the inner one 3.6–6 mm from the margin, the outer one up to 1.5 mm. Inflorescences auxotelic, pedicels 26–31 mm long, pubescent; bracteoles concealing the ovary, widely deltate, 9–13 × 9–10 mm, apex acute or obtuse, pubescent, not ciliate, persistent at anthesis. Buds obpyriform, 15–18 × 4–14 mm; calyx lobes 4, widely ovate, unequal, the external pair 10–11 × 5.8–6 mm, the internal pair 7–9 × 3–4 mm, pubescent, not ciliate; petals 4, 12–13 × 6–8 mm; ovary ca. 3 × 4 mm, pubescent, style ca. 15 mm long, staminal ring subquadrate. Fruits not seen.

Phenology:—Flowers in October.

Distribution and habitat:—Occurring on the montane Atlantic forest of Espırito Santo State (Brazil).

Notes:—*Eugenia ruschiana* is related with *E. itacarensis* from which differs by its larger pedicels (> 26 mm long *versus* up to 11 mm long.), smaller bracteoles (up to 13 mm long *versus* more than 15 mm long.), smaller sepals (up to 13 mm long *versus* more than 15 mm long) and mature twigs subquadrate (*versus* only the young twigs subquadrate).

15. *Eugenia salaciifolia* Bunger & Mazine, *Kew Bulletin* 73: 38. 2018. Type:—BRAZIL. Minas Gerais, Itamarandiba, 18° 13' 51" S, 42° 51' 54" W, 13 Jan. 1998, (fl.), *Pirani, J. R. et al. 3954* (BHCB!; SPF!). **Figure 4C.**

Treelets to 3 m tall; young twigs rusty, glabrous. Leaves with petioles 7.7–13.1 × 2.1–2.3 mm, canaliculate, glabrous; blades elliptic, 105.2–154 × 42.1–61.4 mm, coriaceous, discoloured, glabrous, glandular dots scarcely visible on both sides, apex acute; base acute; margin revolute; midvein sulcate adaxially, raised abaxially; lateral veins 14–23 on each side, visible on either side, sometimes faintly raised adaxially; marginal vein 2.0–2.6 mm from the margin. Inflorescences auxotelic, terminal, pedicels 10.5–20.3 mm long, rusty-pubescent; bracteoles concealing the ovary

deltate, 3.4–11.9 × 2.9–10 mm, apex rounded, rusty-pubescent, not ciliate, persistent at anthesis. Buds not seen; calyx lobes 4, of equal size, ovate, apex acute, 10.6–14.4 × 9.7–12.8 mm, rusty-pubescent, not ciliate; petals not seen; ovary ca. 4 × 7.8 mm, rusty-tomentose; style ca. 7.4 mm long, staminal ring subquadrate. Fruits globose, 15.6–23.5 mm in diameter, rusty-pubescent, 1 seed ca. 11.1 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.

Specimen examined:—BRAZIL. Minas Gerais: Itamarandiba. *Mota et al. 1331* (BHCB!).

Phenology:—Flowers in January; fruits in August.

Distribution and habitat:—Occurring in the Espinhaço Range, a transitional region of the Atlantic forest and Cerrado, in Minas Gerais State (Brazil).

Notes:—*Eugenia salacifolia* is could be confused with *Eugenia macrantha* O. Berg (1857: 301) (*E. sect. Umbellatae*), however differs by inflorescences auxotelic, that are typically from *E. sect. Phyllocalyx* (*versus* fascicles), larger (3.4–11.9 mm long. *versus* ca. 2–4 mm long) and persistent bracteoles (*versus* caducous) and larger calyx lobes (10.6–14.4 mm long *versus* 4–8 mm long).

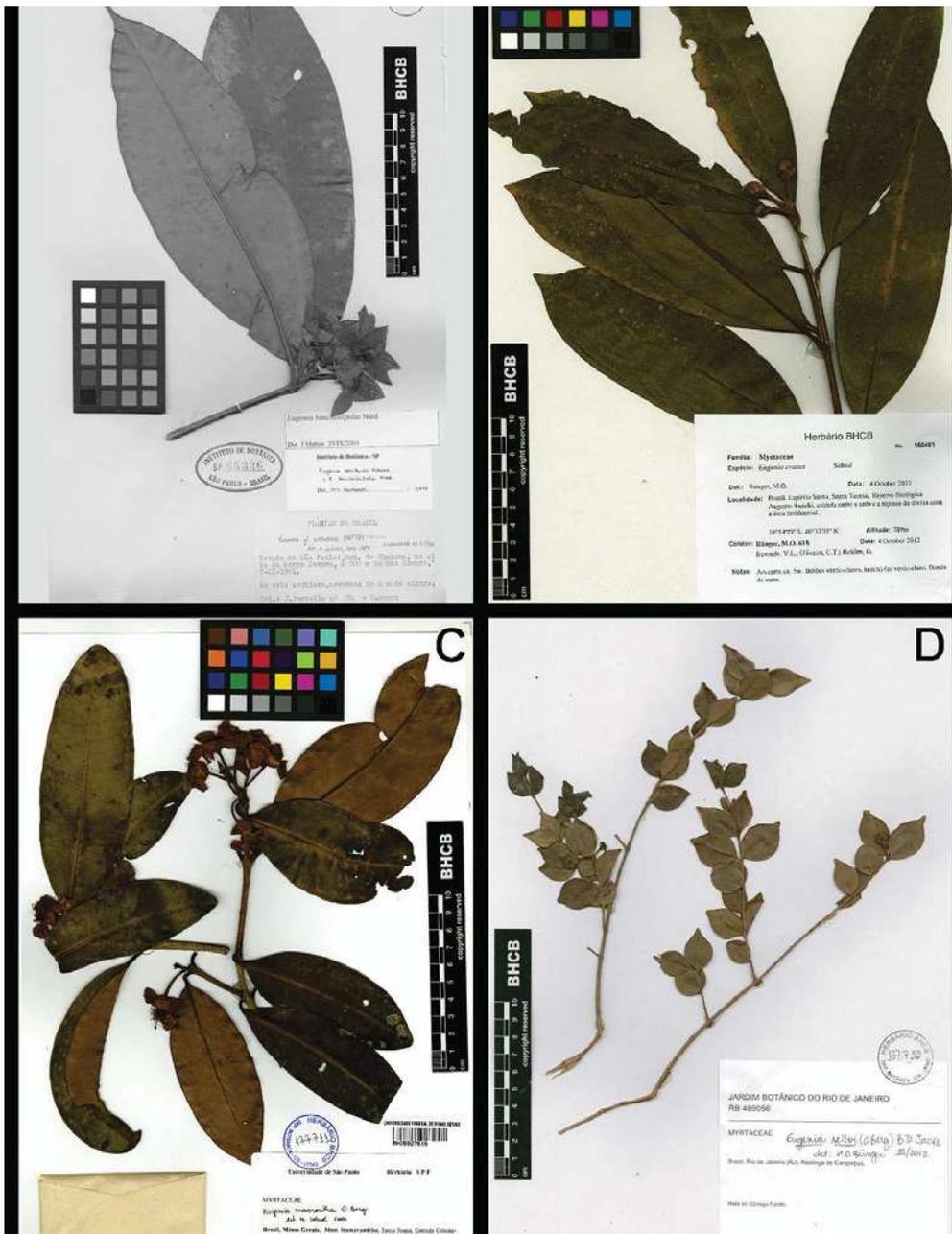


FIGURE 4 A) *Eugenia regia* (Fontella & Moura 94 SP), B) *E. ruschiana* (Bünger, M. O. et al. 618 BHCB), C) *E. salacifolia* (Pirani, J. R. et al. 3954 BHCB, SPF), D) *E. selloi* (Santos, M.G. et al. 579 BHCB, RB).

16. *Eugenia selloi* B.D.Jackson, Index Kewensis 1: 911. 1893. Type:—BRAZIL: *in arenosis maritimis prope Rio de Janeiro: Sellow, Beyrich: ad Tejuco: Mikan 1011* (holotype B f; **lectotype here designated** K 000276595 [Mikan 1011]!, isotypes W, K 000276596 [Sellow s.n.]!) **Figure 4D**.

≡ *Eugenia edulis* (O.Berg) Kiaerskou, Enum. Myrt. Bras.: 162. 1893, *nom. illeg.*; ≡ *Phyllocalyx edulis* var. *depauperata* O. Berg, Fl. Bras. 14 (1): 327. 1857.

= *Phyllocalyx edulis* var. *dives* O. Berg, Fl. Bras. 14 (1): 327. 1857. Type:—BRAZIL: *circa Rio de Janeiro: Schott 1012, Pitangatuba incolis* (holotype W, isotypes K 000276593!, 000276718!)

= *Eugenia neonitida* Sobral, Napaea 11: 36. 1995. ≡ *Eugenia nitida* Cambessèdes, *nom illeg.* Fl. Bras. Merid. 2(19): 349. 1832, non *E. nitida* Vell. (1829: 208). Type:—BRAZIL: Cabo Frio, Rio de Janeiro, *Saint-Hilaire 129* (holotype P 00723731!).

Shrubs 0.7–3 m tall; young twigs puberulous. Leaves with petioles 1.7–4.2 × 1.2–2 mm, canaliculate, pubescent; blades widely elliptic, 20–85 × 24–42.8 mm, coriaceous, concolorous, glabrous except on the midvein on both sides, glandular dots visible on both sides, apex acuminate; base acute; margin revolute; midvein sulcate adaxially, raised abaxially; lateral veins 6–19 on each side, visible on either side; marginal veins 2, the inner one 1.7–2.6 mm from the margin, the outer one ca. 0.6 mm. Inflorescences auxotelic, pedicels 4.9–6.6 mm long, pubescent; bracteoles concealing the ovary, deltate, 1.5–3.3 × 1.8–3.1 mm, apex acute, glabrescent, not ciliate, caducous at anthesis. Buds globose 8.5–8.7 × 6.1–6.3 mm; calyx lobes 4, of equal size, elliptic, apex acute, 6.9–7.6 × 3.4–4.2 mm, glabrescent, not ciliate; petals 4, 7.8–8.3 × 6.2–7.8 mm, glabrescent, not ciliate; ovary ca. 4.5 × 3.2 mm, costate, pubescent; style 6.9–7.5 mm long, staminal ring subquadrate. Fruits elliptic, costate, 20–50 mm in diameter, glabrous, 2 seeds ca. 14 mm in diameter; embryo with two fused cotyledons and no visible hypocotyl.

Specimens examined:—BRAZIL. **Rio de Janeiro:** Rio de Janeiro, *Gomes s.n.* (OUPR 7272!); idem, *Pimentel 004* (BHCB!); idem, *Pimentel 005* (BHCB!); idem, *Bünger et al. 566, 568, 569* (BHCB!, RB!); idem, *Gomes s/n* (HB 90556!); Macaé, *Lima 664* (HB!, RB!); Cabiúnas, *Fontella et al. 4210* (HB!).

Phenology:—Flowers in September, flowers and fruits in October and December.

Distribution and habitat:—Occurring commonly but restricted to the *restingas* from Rio de Janeiro (Brazil).

Notes:—*Eugenia selloi* is easily recognized by its blades widely elliptic and ovary and fruits costate. The fruits are edible and known as “pitangatuba” by local population.

TABLE 1. Extinction risk categories of the species, accordingly to previous assessments and the present study. CNCFlora: National Centre for Flora Conservation. IUCN: Global assessments accepted by IUCN, MMA: Brazilian Official List of Flora Threatened Species; Threat categories: DD: data deficient; LC: least concern; VU: vulnerable; EN: endangered; CR: critically endangered.

Species	Redlists/Reference	Criteria	Threatened category
<i>Eugenia elongata</i> Nied.	-	-	DD
<i>Eugenia espinhacensis</i> Bünger & Sobral	Bünger <i>et al.</i> 2014	A2c; D	EN
<i>Eugenia expansa</i> Spring	-	B1ab(i,ii,iii)	VU
<i>Eugenia glandulosa</i> Cambess.	-	B1ab(i,ii,iii)	VU
<i>Eugenia involucrata</i> DC.	-	-	LC
<i>Eugenia itacarensis</i> Mattos	CNCFlora (2015), MMA 2014	A2c; B1ab(ii)	EN
<i>Eugenia luschnathiana</i> (O. Berg) Klottzsch ex B.D. Jacks.	-	B1ab(i,ii,iii)	VU
<i>Eugenia macrobracteolata</i> Mattos	CNCFlora (2015), MMA 2014	A2c; B2ab(iii,v)	EN
<i>Eugenia magnibracteolata</i> Mattos & D. Legrand	-	B1ab(i,ii,iii)	EN
<i>Eugenia membranifolia</i> Nied.	-	A2c; D	EN
<i>Eugenia puberula</i> Nied. *	CNCFlora (2015)	-	LC
<i>Eugenia regia</i> Bünger & Sobral	Bünger <i>et al.</i> 2014	A2c; D	EN
<i>Eugenia ruschiana</i> Bünger & Mazine	Bünger <i>et al.</i> 2016	B1ab(iii)	EN
<i>Eugenia selloi</i> (O. Berg) B. D. Jacks.	-	B2ab(i,ii,iii)	EN
<i>Eugenia magnisepala</i> Bünger & Mazine	Bünger <i>et al.</i> 2018	B1ab(iii), D	CR
<i>Eugenia salacifolia</i> Bünger & Mazine	Bünger <i>et al.</i> 2018	B1ab(iii)	EN

* probably *Eugenia membranifolia* Nied.

Acknowledgments

We thank all colleagues for help with fieldwork, herbarium visits, loans, locating literature, and sharing information in general, specially Marcos Sobral. We thank also all curators of the visited herbaria for allow us to study the specimens and to Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) and Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for the financial support received by the first and the last authors.

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