



## Five new southeastern Brazilian Myrtaceae

MARCOS SOBRAL<sup>1</sup>, FIORELLA F. MAZINE<sup>2</sup>, LÚCIO LEONI<sup>3</sup>, MARCELO C. SOUZA<sup>4</sup> & EUGÊNIO A.D. MELO<sup>5</sup>

<sup>1</sup>DCNAT-UFSJ, São João del-Rei, Minas Gerais, Brazil ([marcos\\_sobral@hotmail.com](mailto:marcos_sobral@hotmail.com)).

<sup>2</sup>Dep. Botânica UFSCAR, Sorocaba, São Paulo, Brazil ([fiorella@ufscar.br](mailto:fiorella@ufscar.br)).

<sup>3</sup>Herbário Guido Pabst, Carangola, Minas Gerais, Brazil ([lucioleoni@ig.com.br](mailto:lucioleoni@ig.com.br)).

<sup>4</sup>Universidade Federal Rural do Rio de Janeiro, Seropédica, Rio de Janeiro, Brazil ([souza.mc@gmail.com](mailto:souza.mc@gmail.com)).

<sup>5</sup>Rua Joseph Mendel 41, Ipatinga, Minas Gerais, Brazil ([eadmelo@uol.com.br](mailto:eadmelo@uol.com.br))

### Abstract

We describe, illustrate and compare with related species the southeastern Brazilian *Calypttranthes arachnicola*, *C. biconvexa*, *C. carangola*, *Eugenia grandissima* and *Plinia longa*. *Calypttranthes arachnicola*, from the state of Rio de Janeiro, is apparently related to *Calypttranthes ursina*, differing by its larger blades and pendulous inflorescences; *Calypttranthes biconvexa*, also from Rio de Janeiro, is apparently related to *C. lanceolata*, being distinguished by its blades with adaxially biconvex midvein and shorter inflorescences; *Calypttranthes carangola*, from the state of Minas Gerais, is apparently close to *C. curta*, differing by its narrower blades, longer inflorescences and narrower bracts; *Eugenia grandissima*, also from Minas Gerais, is apparently close to *E. umbrosa*, but has larger leaves and petioles, blades with midvein adaxially raised and larger bracteoles; and *Plinia longa*, from the state of Espírito Santo, is related to *Plinia edulis*, differing by its narrowly oblong leaves. Additionally, species are evaluated for their conservation status according to the information available.

**Keywords:** Espírito Santo, Minas Gerais, Rio de Janeiro, *Calypttranthes*, *Eugenia*, *Plinia*

### Introduction

Myrtaceae are represented in Brazil by about 1,000 species (Sobral *et al.* 2016) from which about 640 grow along southeastern Brazil (states of Espírito Santo, Minas Gerais, Rio de Janeiro and São Paulo; IBGE 2016a). This region is one of the most intensively botanically surveyed in Brazil, with nearly 1,600,000 collections (INCT 2016, JBRJ 2016) along a total area of 924,600 km<sup>2</sup> (IBGE 2016a), with the average of 1.7 collection/km<sup>2</sup>. Considering that the average collection/area proportion in Brazil is about 0.6 collection/km<sup>2</sup> (Sobral & Stehmann 2009), and that the proportion considered as minimal for tropical countries was proposed to be one collection/km<sup>2</sup> (Campbell 1989; but see Shepherd 2003 for a different and larger estimate), southeastern Brazil may be considered as moderately surveyed. Among this large amount of specimens, several undescribed species were spotted along the recent years (see Sobral & Stehmann 2009 for details). Along the study of specimens of Myrtaceae from southeastern Brazil, we had the opportunity to examine collections of the genera *Calypttranthes* Swartz (1788: 79), *Eugenia* P.Micheli ex Linnaeus (1753: 470) and *Plinia* Plumier ex Linnaeus (1753: 516) that we believe represent undescribed species, which are here proposed as new.

### Material and methods

Specimens examined are kept in the herbaria listed under each species; herbaria are identified by the acronyms listed in Thiers (2016). Online images of type specimens of related species, when available, are referred by the herbarium acronym followed by the barcode number or herbarium number of the specimens. Species are distinguished in morphological grounds, following the morphological species concept (“the presence of one or more unique characters or a unique combination of them”; see Nixon & Wheeler 1990 & McDade 1995). Terminology in descriptions mostly follows standard taxonomy glossaries (e.g. Hickey & King 2000, Gonçalves & Lorenzi 2011). Conservation status

was assigned according to IUCN criteria (IUCN 2001); considering the scarcity of information available in several cases, we provide data regarding the sampling efforts in the municipalities where the species were collected, which can be useful for future efforts in finding a more precise conservation status for them, since the scarcity of collections of one species along a well surveyed area may be taken as a possible indicative of its relative rareness. Data on the area of municipalities are from IBGE (2016b) and on number of plant collections are the sum of data available at INCT (2016) and JBRB (2016). We consider here as a minimally surveyed area one that reaches the Campbell index (one collection/km<sup>2</sup>; Campbell 1989).

## Taxonomy

1. *Calyptranthes arachnicola* Sobral & M.C.Souza, *sp. nov.* Type:—BRAZIL. Rio de Janeiro: mun. Mangaratiba, Reserva Ecológica do Rio das Pedras, Alto da Cabiúna, Toca da Aranha, 11 January 1999, *J.M.A.Braga, M.G. Bovini & C.M. Mynssen 5130* (holotype RB!; isotype HUFJSJ!). Figure 1.

This species is apparently related to *Calyptranthes ursina*, from which it is kept apart by its larger blades (to 150 × 46 versus to 100 × 30 in *C. ursina*), inflorescences pendulous (vs. erect), slender (axis to 0.7 mm wide vs. 1.5–2 mm wide) and ebracteate (vs. with bracts to 20 × 5 mm), with flowers laxly distributed along the inflorescence (vs. crowded at the apex of the branches) and evidently apiculate buds (vs. not visibly apiculate). It also reminds *Calyptranthes fusiformis*, but it is distinguished from it by the pilose inflorescences and flowers (versus glabrous in *C. fusiformis*) and buds shortly apiculate (apiculum to 1.7 mm vs. to 7 mm).

Tree to 3 m. Cortex exfoliating (according to the specimen *Lira Neto 534*). Twigs terete or subterete, sometimes dichotomously branching, when young with simple brown ascending trichomes 1.5–2 mm, these soon deciduous, the older ones light brown or grey; internodes 35–50 × 0.8–1.5 mm. Leaves with petioles 5–9.5 × 0.8–1.5 mm, with trichomes as the twigs and turning glabrous with age, slightly sulcate adaxially; blades narrowly elliptic to oblong, 120–150 × 31–46 mm, 3.2–4.2 times longer than wide, mostly concolorous or sometimes discolorous when young, dull light brown when dry, occasionally the surface undulate mostly along the lateral and secondary lateral veins, the adaxial face glabrous, the abaxial face densely covered by brown trichomes to 1.5 mm when young, these becoming very scattered and mostly restricted to the midvein with age; glandular dots to 10/mm<sup>2</sup>, smaller than 0.1 mm in diameter, visible on both sides, sometimes slightly excavated adaxially and moderately raised abaxially; apex markedly acuminate in 12–21 mm; base cuneate; midvein finely impressed adaxially and raised abaxially; lateral veins 25 to 35 at each side, leaving the midvein at angles about 60°, finely raised on both sides; marginal vein 1–2.3 mm from the finely undulate and sometimes moderately revolute margin. Inflorescences pendulous, two arising opposite from the same point of a branch, arising from brachyblasts below the leaves or at the base of new twigs, sometimes with triangular-lanceolate bracts to 8 × 2 mm at their bases, racemiform or paniculiform, pilose, the main axis 35–75 × 0.2–0.7 mm, with simple ascending brown trichomes 0.7–1 mm, with 3 to 15 flowers frequently in groups of three, the branches to 7–8 × 0.1–0.2 mm, when paniculiform the peduncles to 65 mm; bracts linear, at the base of the ramifications, 3.5–4 × 0.1–0.2, sometimes bracteoles at the base of some flowers (what also could be interpreted as bracts at the base of groups of flowers) 1–2 × 0.1 mm, deciduous at anthesis; flowers uniformly pilose with brown trichomes to 1 mm; buds elliptic, 4–4.5 × 1.5–1.6 mm; calyx lobes fused into a markedly apiculate calyptra to 2 × 1.5 mm, the apiculum 1–1.7 mm; petals in flowers examined one, very irregular, to 1.5 × 1 mm; stamens about 60, in bud to 3 mm, the anthers globose, to 0.2 × 0.2 mm, eglandular; calyx tube glabrous, to 1.5 mm deep; style to 4 mm in bud, the stigma punctiform; ovary with two locules and two ovules per locule. Fruits globose or slightly oblate, immature, 6 × 6–7 mm, crowned by the calyx tube; seed one, with brown shining testa; embryo very immature, not examined.

Distribution, habitat, phenology:—This species was collected in coastal rainforests at altitudes 200–400 m elev. in the municipality of Mangaratiba, in the southern portion of Rio de Janeiro; flowers were collected in December and January and fruits in July.

Conservation:—The municipality of Mangaratiba has an area of 356 km<sup>2</sup> (IBGE 2016b), with about 3,800 collections registered there (INCT 2016, JBRJ 2016), and an average of 10 collections/km<sup>2</sup>, that can be considered a good sampling effort. Considering this, the existence of only three collections from a relatively small area (1,300 ha; see Luz *et al.* 2011) may be an indicative of its rareness. Nevertheless, although the scarcity of collections and the small extent of occurrence may indicate a potentially vulnerable species, we do not have additional information regarding the quality of the environment at the collection place; so, it seems presently adequate to score this species as DD (Data Deficient) according to IUCN conservation criteria (IUCN 2001).



FIGURE 1. *Calypttranthes arachnicola*—holotype. Insert: detail of inflorescence from isotype at HUFJSJ (scale: 10 mm).

Affinities:—This species is apparently related to *Calypttranthes ursina* G.M.Barroso & Peixoto (1996: 79; no type image available online) and *C. fusiformis* M.L.Kawasaki (1996: 508; type image: SP barcode 001310), from which it is kept apart by the characters given in the diagnosis.

Etymology:—The epithet is derived from the Latin translation for the collection place, Toca da Aranha (i. e., spider's home in Portuguese).

Paratypes:—BRAZIL. Rio de Janeiro: mun. Mangaratiba, Reserva Ecológica do Rio das Pedras; trilha para o Cambucá, 21 December 1996, *J.A. Lira Neto & M.G. Bovini* 534 (RB!, HUFJSJ!, UB); idem, 05 July 1997, *J.A. Lira Neto, R.H.P. Andreato, O. Marquete, C. Meisner, I. Cristina & Valéria* 554 (RB!, F, K, UB).

2. *Calypttranthes biconvexa* M.C.Souza & Sobral, *sp. nov.* Type:—BRAZIL. Rio de Janeiro: mun. Guapimirim, Granja Monte Olivete, trilha das Andorinhas, 500 m, 18 January 1995, *J.M.A. Braga, M.G. Bovini & J.R. de Figueiredo* 1738 (holotype RB!). Figure 2.

This species is apparently related to *Calypttranthes lanceolata*, from which it is distinguished by the leaves with smaller petioles (to 4 mm versus to 15 mm in *C. lanceolata*) and blades (to 180 mm vs. to 300 mm), blades with midvein markedly biconvex adaxially (vs. sulcate) and the smaller inflorescences with winged axis (to 20 mm vs. to 200 mm, the axis not winged).

Shrub to 2.5 m. Plants glabrous, except for brown dibrachiate trichomes to 0.1 mm in the flower buds. Twigs appanate and sometimes with small longitudinal wings to 0.4 mm wide, sometimes with four to six imbricate narrowly triangular cataphylls to  $7 \times 0.5$  mm at their bases; internodes  $10\text{--}20 \times 1\text{--}2$  mm. Leaves with petioles  $3.5\text{--}4 \times 1\text{--}1.5$  mm, adaxially sulcate; blades narrowly elliptic to oblong,  $110\text{--}180 \times 28\text{--}50$  mm, 3.6–4 times longer than wide, discolorous when dry, dark dull brown adaxially, lighter abaxially; glandular dots scarcely visible through light, about 0.1 mm in diameter and about 20/mm<sup>2</sup>, sometimes slightly excavated adaxially; apex acuminate in 15–22 mm; base obtuse; midvein raised and biconvex—i.e., elevated with a visible central longitudinal furrow—adaxially, raised and lighter than the surface abaxially; lateral veins 20 to 30 at each side, leaving the midvein at angles 70–80°, moderately raised on both sides, lighter than the surface abaxially, with secondary lateral veins of smaller gauge occasionally visible; marginal vein 0.8–2 mm, occasionally a second vein to 1 mm from the plane or moderately revolute margin. Inflorescences axillary or ramiflorous, in parts of the branches devoid of leaves, racemiform, appanate and sometimes with wings to 0.2 mm wide, axis  $12\text{--}20 \times 0.8\text{--}1.5$  mm, with three to five sessile flowers; bracts linear, to  $1.5 \times 0.2$  mm; flower buds fusiform to globose, to  $3\text{--}4.5 \times 1.5\text{--}3$  mm, apiculate, the apiculum 0.4–0.8 mm; calyx lobes fused and opening through a calyptra to  $1.5 \times 2$  mm; petals not seen in the flowers examined, possibly abortive; stamens (in bud) to 3 mm, the anthers globose, to 0.3 mm, eglandular; staminal ring to 2 mm in diameter, glabrous; style to 4 mm, the stigma punctiform; calyx tube to 1 mm deep, glabrous; ovary with two locules and two ovules per locule. Fruits not seen.

Distribution, habitat, phenology:—This species is presently known only for the type collection, from dense rainforests in the municipality of Guapimirim, in the central portion of Rio de Janeiro, at about 500 m elev.; flowers were collected in January.

Conservation:—The municipality of Guapimirim has an area of 360 km<sup>2</sup> (IBGE 2016b), from which are registered about 4,100 plant specimens (INCT 2016, JBRJ 2016), with an average of more than 11 collections/km<sup>2</sup>, a good sampling effort. The existence of only one collection of *Calypttranthes biconvexa* may be an indicative of its rareness; nevertheless, we do not have additional information regarding the environmental conditions of the collection site, and then we score this species as DD (Data Deficient) according to IUCN conservation criteria (IUCN 2001).

Affinities:—*Calypttranthes biconvexa* is apparently related to *C. lanceolata* O.Berg (1857–1859: 51; type image: BR barcode 0000005230907!), from which it is distinguished by the characters given in the diagnosis.

Etymology:—The epithet is allusive to the adaxially biconvex midvein of this species.

3. *Calypttranthes carangola* Sobral & Leoni, *sp. nov.* Type:—BRAZIL. Minas Gerais: mun. Carangola, Fazenda Santa Rita, 600 m, 20°46' S, 42°02' W, 7 July 1990, *L.S. Leoni* 1156 (holotype GFJP!). Figure 3.

This species is apparently related to *Calypttranthes curta*, from which it is distinguished by its indumentum of mostly dibrachiate, strongly asymmetrical trichomes to 1 mm (versus a mixture of simple and dibrachiate trichomes mostly up to 0.4 mm in *C. curta*), leaves with slender petioles to  $10.5 \times 1.2$  mm (versus to  $9 \times 2.5$  mm) and narrower blades to  $107 \times 46$  mm (versus  $110 \times 63$  mm), with more scattered glandular dots (up to 8/mm<sup>2</sup> vs. up to 30/mm<sup>2</sup>), and its longer inflorescences (up to 30 mm vs. up to 7 mm) with narrowly triangular bracts to  $3 \times 1$  mm (vs. cordiform, to  $3 \times 4$  mm).



FIGURE 2. *Calyptranthes biconvexa*—isotype at HUFSJ (scale: 50 mm). Insert: detail of inflorescence (scale: 10 mm).



FIGURE 3. *Calyptranthes carangola*—holotype. Insert: detail of inflorescence (scale: 10 mm).

It may also resemble *Calypttranthes pteropoda*, from which it is kept apart mostly through the pilose twigs and blades (vs. glabrous in *C. pteropoda*) and the terete or slightly applanate, markedly pilose inflorescence axis (versus glabrous and markedly winged inflorescence axis).

Shrub 1.2–2.5 m. Twigs brown, sometimes dichotomously branching, terete or slightly applanate with a moderately visible longitudinal furrow, when young densely covered with strongly asymmetrical dibrachiate trichomes to 1 mm; internodes 30–50 × 1–2 mm. Leaves with petioles 8–10.5 × 1–1.2 mm, adaxially sulcate, with scattered trichomes as the twigs and glabrescent with age; blades narrowly elliptic or sometimes slightly obovate, 82–107 × 30–46 mm, 2.3–3.2 times longer than wide, discolorous when dry, adaxially dull brown and glabrous, abaxially light brown and with moderately scattered strongly asymmetrical dibrachiate trichomes 0.3–1 mm, these more dense along the midvein, mostly falling with age; glandular dots about 0.05 mm in diameter, 4 to 8/mm<sup>2</sup>, visible abaxially; apex acuminate to 7–8 mm; base cuneate; midvein finely sulcate adaxially and strongly raised abaxially; lateral veins 13 to 18 at each side, leaving the midvein at angles of 70–80°, barely visible adaxially and moderately salient abaxially, the secondary lateral veins and higher level venation also visible abaxially; marginal vein 1.2–2.2 mm from the margin, the margin itself plane or moderately revolute, with a brownish thickening to 0.2 mm wide. Inflorescences axillary, the axis 5–7 × 1.2–1.5 mm, terete or slightly applanate, densely covered with asymmetrical dibrachiate trichomes to 0.5 mm, with up to three flowers at its apex; bracts narrowly triangular, 1.5–3 × 1 mm, pilose as the axis at least abaxially; flowers sessile; bracteoles apparently one per flower, triangular, to 0.8 × 0.3 mm, adaxially glabrous, abaxially with trichomes as the axis; flower buds elliptic, to 4 × 2.5 mm, apiculate to 0.3 mm, mostly densely and uniformly covered with grey asymmetrical dibrachiate trichomes to 0.5 mm, sometimes more densely so on the ovary; calyptra to 2 × 2 mm; petals two in the flowers examined, glabrous, white, spatulate, to 3 × 1 mm; stamens about 80, to 5 mm, the anthers globose, to 0.2 × 0.2 mm, with one apical gland; staminal ring to 2 mm in diameter, glabrous; calyx tube 1–1.5 mm deep, glabrous; style not seen, broken in the flowers examined; ovary bilocular, with two ovules per locule. Fruits immature, globose, to 8 mm in diameter, with the calyx tube persisting at its apex; seeds immature, not examined.

Distribution, habitat and phenology:—This species is presently known from three collections from the municipalities of Carangola and Faria Lemos, in the eastern part of Minas Gerais along the limits with the neighboring states of Espírito Santo and Rio de Janeiro, where it grows in humid forests at about 600 m elev.; flowers were collected in January and July, and fruits in March.

Conservation:—The neighboring municipalities of Carangola and Faria Lemos comprise an area of 518 km<sup>2</sup> (IBGE 2016b), and there are about 2,850 collections from there (INCT 2016, JBRJ 2016), with an average of 5.5 collections/km<sup>2</sup>, a moderate sampling effort. The existence of only three specimens of this species may suggest that it is not frequent, and an area of occurrence smaller than 5,000 km<sup>2</sup> with less than five locations are indicative of a possibly threatened species; nevertheless, we do not have additional information regarding environmental aspects of the collection sites, what do not fully fulfill the IUCN conservation criteria (IUCN 2001); so, we presently score this species as DD (Data Deficient).

Affinities:—This species is apparently related to *Calypttranthes curta* Sobral & Aguiar (Sobral *et al.* 2012: 22; no image available online), from montane rainforests of the state of São Paulo, and may also remind *Calypttranthes pteropoda* O.Berg (1857–1859: 47; type image: BR barcode 0000005229277!), from the states of Minas Gerais and Rio de Janeiro, and is distinguished from these species by the characters given in the diagnosis.

Etymology:—The epithet was chosen after the type locality, Carangola, used here in apposition.

Paratypes:—BRAZIL. Minas Gerais: mun. Faria Lemos, Fazenda Santa Rita, March 2000, *L.S. Leoni 4392* (GFJP!, HUFSJ!); idem, January 2002, *L.S. Leoni 4846* (GFJP!, RB!).

4. *Eugenia grandissima* Sobral, Mazine & E.A.D.Melo, *sp. nov.* Type:—BRAZIL. Minas Gerais: mun. Ipatinga, bairro Ipanemão, 19°25'10.8" S, 42°09'50.2" W, February 2016, *M. Sobral & E.A.D. Melo 15783* (holotype IAC!; isotypes BHCB!, HUFSJ!, RB!, SORO!). Figures 4–7.

This species is apparently related to *Eugenia umbrosa*, differing by the pilose twigs and leaves (versus glabrous in *E. umbrosa*), larger leaves (petioles 15–25 mm and blades 450–550 × 110–180 mm versus petioles to 8 mm and blades 180–200 × 46–50 mm) with the midvein plane or markedly raised adaxially (vs. impressed adaxially), marginal vein to 14 mm from the margin (vs. marginal vein up to 5 mm from the margin) and longer bracteoles (to 15 mm vs. to 2 mm).

Tree 3–5 m, the trunks slender, rarely more than 100 mm in diameter at body's height. Twigs moderately applanate, sometimes slightly longitudinally striate, densely covered with simple brown trichomes to 0.8 mm, the internodes to 6 × 8–10 mm. Leaves with petioles 15–25 × 5–6 mm, terete or slightly canaliculate adaxially, moderately pilose as



FIGURE 4. *Eugenia grandissima*—unmounted holotype (scale: 50 mm).



FIGURE 5. *Eugenia grandissima*—branch (Sobral & Melo 15778; photo by M. Sobral).

the twigs; blades lanceolate-oblong, 450–550 × 110–180 mm, 3.3–5 times longer than wide, concolorous or slightly discolorous when dry, adaxially with simple brown trichomes 0.8–1 mm mostly along the midvein, scattered along the surface and somewhat denser over the lateral veins and margin, abaxially uniformly covered by trichomes to 1 mm or occasionally with irregular and scattered denser tufts of trichomes to 1 mm in diameter that may simulate large glandular dots; glandular dots about 0.1 mm in diameter, 10 to 15/mm<sup>2</sup>, scarcely visible on both sides and more evident through light; apex acute; base cuneate; midvein plane to visibly raised adaxially, strongly raised abaxially; lateral veins 28 to 30 at each side, visible on both sides and raised abaxially, leaving the midvein at angles 45–60°; marginal vein 5–14 mm from the margin, sometimes a second outer vein visible, 2–3 mm from the margin, the margin itself moderately to markedly revolute and with a brown girdle to 0.4 mm wide. Inflorescences axillary or ramiflorous, racemiform, with 6 to 10 flowers, the axis 10–90 × 3–5 mm, densely covered with red brown simple trichomes to 0.5 mm; bracts at the base of the inflorescences in 2 to 4 series, the most proximal ones widely triangular, to 2 × 3 mm, the medial ones triangular, to 5 × 4 mm and the most distal ones narrowly triangular, to 9 × 4–5 mm, usually deciduous but sometimes persisting along anthesis, densely covered with brown trichomes to 0.5 mm, more densely so abaxially; bracts at the base of the pedicels widely triangular, to 2 × 3 mm, pilose as the other bracts; pedicels 14–40 × 1.5–2 mm, pilose as the axes; bracteoles elliptic, 10–15 × 5–8 mm, the apex sometimes shortly apiculate, at anthesis separate and deciduous, when very young connate between them, pilose as the bracts; flower buds obovate, 12–13 × 10 mm, densely and uniformly covered with brown trichomes 0.3–0.5 mm; calyx lobes four, glabrous adaxially, usually tearing transversely proximally after anthesis, unequal, the outer ones ovate, 7–8 × 8–10 mm, the inner ones ovate-triangular, 8–11 × 6–9 mm; petals four, elliptic, 15–20 × 11–14 mm, white, glabrous; stamens about 200, the filaments 5–6 mm, the anthers 1–1.2 × 0.3–0.4 mm, white, with one conspicuous apical gland, the pollen visibly whitish; staminal ring to 10 mm in diameter, glabrous or with scattered brown trichomes to 0.3 mm; calyx tube absent or up to 0.5 mm; style 12–15 mm, the stigma minutely papillose; ovary with two locules and up to 30 ovules per locule. Fruits oblong, 70–90 × 30–50 mm, densely pilose, with about seven subglobose or ellipsoid seeds to 15–20 × 10–15 mm, with white testa when fresh; embryos not examined.



**FIGURE 6.** *Eugenia grandissima*—flowers (Sobral e Melo 15783; photo by M. Sobral).

**Distribution, habitat and phenology:**—This species grows in rainforests and forest edges in the municipalities of Ipatinga and Santana do Paraíso, at about 290 m elev., in the eastern portion of Minas Gerais; flowers were collected in February, but were also observed in December and January (Melo, personal observation); fruits were observed from September to December (Melo, pers. obs.), but were not collected.

**Conservation:**—The neighboring municipalities of Ipatinga and Santana do Paraíso are very scarcely surveyed: they have a total area of about 440 km<sup>2</sup> (IBGE 2016b), and only 190 collections are recorded from both (INCT 2016, JBRJ 2016), with an average of 0.4 collection/km<sup>2</sup>. *Eugenia grandissima* is not a frequent species and has a somewhat patchy distribution (E. Melo, pers. obs.). Considering the specimens collected, extent of occurrence (EOO; see IUCN 2001) may be estimated via Geocat (Bachman *et al.* 2011) as about 5 km<sup>2</sup> (criterion B1 of IUCN 2001); considering this and the fact that it was collected in fragmented forests (criterion a(i) of IUCN) and its extent of occurrence as well as the quality of its habitat are declining due to urban occupation (criteria b(i) and b(iii) of IUCN), these conditions suggest the category of CR (Critically Endangered). On the other hand, it is important to keep in mind that, since the area where *E. grandissima* comes from is very scarcely surveyed, this situation may be reevaluated when new information becomes available.

**Affinities:**—This species is apparently related to the southeastern Brazilian *Eugenia umbrosa* O.Berg (1857–1859: 582), differing by the characters given in the diagnosis. *Eugenia grandissima*, considering its racemiform inflorescences with internodes shorter than the pedicels, may be related to clade 9 of the phylogenetic scheme proposed by Mazine *et al.* (2014).

**Etymology:**—The epithet is derived from the Latin word for “very large”, in allusion to its uncommonly large leaves among southeastern Brazilian species of *Eugenia*.

**Paratypes:**—BRAZIL. Minas Gerais: mun. Ipatinga, bairro Ipanemão, 19°25'10.8" S, 42°39'50.2" W, 17 February 2016, M. Sobral & E.A.D. Melo 15778 (BHCB!, HUFSJ!, SORO!); mun. Santana do Paraíso, a partir de Ipatinga, bairro rural Ipaneminha, -19.414167 N, -42.529167 E (19°24'51" S, 42°31'45" W), 25 February 2008, L.C. Bernacci & R. Tsuji 4450 (HPL!, IAC!, HUFSJ!).

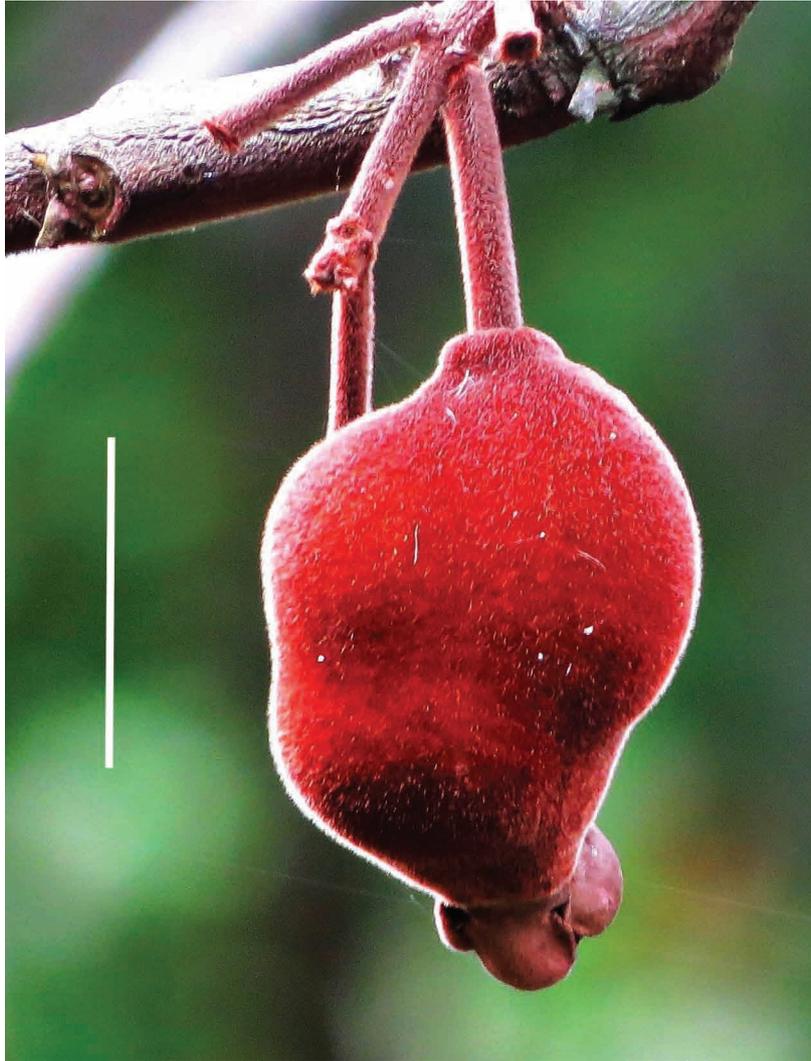


FIGURE 7. *Eugenia grandissima*—immature fruit (photo by E. Melo; scale: 20 mm).

5. *Plinia longa* Sobral & M.C.Souza, *sp. nov.* Type:—BRAZIL. Espírito Santo: mun. Governador Lindenberg, 7 November 2007, *V. Demuner 4497* (holotype MBML!; isotype RB!). Figure 8.

This species is apparently related to *Plinia edulis*, from which it is distinguished by its small height (up to 2 m versus up to 20 m in *P. edulis*), its oblong blades (vs. lanceolate), which are longer (to 225 × 45 mm vs. to 130 × 50 mm) and narrower (5–6 vs. to 3.5 times longer than wide) and flowers with brown indumentum (vs. white).

Shrub to 2 m. Twigs glabrous, slightly applanate, the internodes 20–40 × 4 mm. Leaves with petioles glabrous, 10–12 × 2–3 mm, strongly canaliculate; blades narrowly oblong, 200–225 × 35–45 mm, 5–5.7 times longer than wide, dull green when dry, slightly discolorous when dry, glabrous, with glandular dots visible only through light, smaller than 0.1 mm in diameter and 30 to 50/mm<sup>2</sup>; midvein impressed adaxially and strongly raised abaxially; lateral veins 20 to 30 at each side, faintly impressed adaxially and markedly raised abaxially, leaving the midvein at angles 70–80°; marginal vein 2–2.8 mm from the margin, sometimes a second marginal vein to 0.5 mm, the margin itself moderately revolute and with a brown girdle to 0.2 mm wide. Inflorescences cauliflorous, without evident axis, with up to eight flowers; bracts triangular, to 7 × 4 mm, with trichomes to 1 mm abaxially, deciduous; pedicels absent; bracteoles triangular or narrowly triangular, to 4 × 2 mm, with trichomes as the bracts, deciduous at anthesis; flower buds not examined; calyx lobes and ovary externally densely and uniformly covered with brown simple trichomes 1–1.2 mm, the calyx lobes four, irregularly triangular, 2–3 × 3 mm, with the trichomes sometimes united at the tip for up to 2 mm and simulating a longer and narrower linear structure; petals four, elliptic, 1.5–2 × 1–2 mm, ciliate; stamens not counted, 5–6 mm, the anthers globose, to 0.5 × 0.5 mm, with one subapical gland; staminal ring to 2 mm in diameter, glabrous; calyx tube to 3 mm deep, glabrous; style to 8 mm, glabrous; ovary with two locules and two ovules per locule. Fruits not seen.



FIGURE 8. *Plinia longa*—isotype at RB. Insert: detail of inflorescence and flowers (scale: 10 mm).

Distribution, habitat and phenology:—*Plinia longa* is presently known only from the type collection, from the municipality of Governador Lindenberg, between 420–590 m elev., in the central portion of Espírito Santo, where it was collected in rainforests; flowers were collected in November.

Conservation:—This species was collected in the municipality of Governador Lindenberg, with an area of 359 km<sup>2</sup> (IBGE 2016b) and from which are registered about 670 plant collections (INCT 2016, JBRJ 2016), resulting in an average of 1.8 collection/km<sup>2</sup>, a moderate collection effort. Considering this and the scarcity of additional information about the environment of *Plinia longa*, it seems adequate to score it as DD (Data Deficient) according to IUCN's conservation criteria (IUCN 2001).

Affinities:—This species is apparently related to the southern Brazilian *Plinia edulis* (Vellozo) Sobral (basionym: *Eugenia edulis* Vellozo [1829: 208], Sobral 1985: 2; for description see Sobral 2003; type image not available online), from which it is distinguished by the characters given in the diagnosis.

Etymology:—The epithet is derived from the Latin word for “long”, alluding for the long and narrow leaf blades of this species.

## Acknowledgments

We are grateful to Rafaela C. Forzza and Erika von Sohsten Medeiros from RB and Mariana Bünger from herbarium BHCB for their kind help in preparing the images, as well as to the collectors of the specimens cited, for their invaluable fieldwork and for kindly making their collections available to our studies.

## Literature cited

- Bachman, S., Moat, J., Hill, A.W., de la Torre, J. & Scott, B. (2011) Supporting Red List threat assessments with GeoCAT: geospatial conservation assessment tool. In: Smith, V. & Penev, L. (ed.) E-Infrastructures for data publishing in biodiversity science. *ZooKeys* 150: 117–126.  
<http://dx.doi.org/10.3897/zookeys.150.2109>
- Barroso, G.M. & Peixoto, A.L. (1996) Uma nova espécie de *Calypttranthes* (Myrtaceae) da flora do Rio de Janeiro. *Acta Botanica Brasilica* 10: 79–83.  
<http://dx.doi.org/10.1590/S0102-33061996000100007>
- Berg, O.C. (1857–1859) Myrtaceae. *Flora Brasiliensis* 14 (1): 1–656.
- Campbell, D.G. (1989) The importance of floristic inventory in the tropics. In: Campbell, D.G. & Hammond, D. (Eds.) *Floristic inventory of tropical countries: the status of plant systematics, collections, and vegetation, plus recommendations for the future*. New York, New York Botanical Garden, pp. 5–30.
- Gonçalves, E. & Lorenzi, H. (2011) *Morfologia vegetal*. 2 ed. São Paulo, Plantarum, 544 pp.
- Hickey, M. & King, C. (2000) *The Cambridge illustrated glossary of botanical terms*. Cambridge University Press, 208 pp.
- IBGE (Instituto Brasileiro de Geografia e Estatística) (2016a) *IBGEestados@*. Available from: <http://www.ibge.gov.br/estadosat/> (accessed 27 February 2016)
- IBGE (Instituto Brasileiro de Geografia e Estatística) (2016b) *IBGEcidades@*. Available from: <http://www.ibge.gov.br/estadosat/> (accessed 27 February 2016)
- INCT (Instituto Nacional de Ciências e Tecnologia) (2016) speciesLink. Available from: <http://inct.splink.org.br/> (accessed 27 February 2016)
- IUCN (International Union for the Conservation of Nature and Natural Resources) (2001) *IUCN Red List Categories and Criteria: Version 3.1*. Gland, Switzerland. Available from: <http://www.iucnredlist.org/technical-documents/categories-and-criteria> (accessed 30 June 2015)
- Kawasaki, M.L. (1996) A new species of *Calypttranthes* (Myrtaceae) from southeastern Brazil. *Brittonia* 48: 508–510.  
<http://dx.doi.org/10.2307/2807867>
- JBRJ (Instituto de Pesquisas Jardim Botânico do Rio de Janeiro) (2016) Jabot - Banco de Dados da Flora Brasileira. Available from: <http://www.jbrj.gov.br/jabot> (accessed 27 February 2016)
- Linnaeus, C. (1753) *Species Plantarum* 1: 1–560.
- Luz, J.L., Costa, L.C., Lourenço, E.C. & Esbérard, C.E.L. (2011) Morcegos (Mammalia, Chiroptera) da Reserva Rio das Pedras, Rio de Janeiro, sudeste do Brasil. *Biota Neotropica* 11: 95–101.  
<http://dx.doi.org/10.1590/S1676-06032011000100009>

- Mazine, F.F., Souza, V.C., Sobral, M., Forest, F. & Lucas, E. (2014). A preliminary phylogenetic analysis of *Eugenia* (Myrtaceae: Myrteae) with a focus on Neotropical species. *Kew Bulletin* 69: 9497.  
<http://dx.doi.org/10.1007/s12225-014-9497-x>
- McDade, L. (1995) Species concepts and problems in practice: insight from botanical monographs. *Systematic Botany* 20: 606–622.  
<http://dx.doi.org/10.2307/2419813>
- Nixon, K.C. & Wheeler, Q.D. (1990) An amplification of the phylogenetic species concept. *Cladistics* 6: 211–223.  
<http://dx.doi.org/10.1111/j.1096-0031.1990.tb00541.x>
- Shepherd, G.J. (2003) *Avaliação do estado do conhecimento da diversidade biológica do Brasil: plantas terrestres—versão preliminar*. Ministério do Meio Ambiente, Brasília, 60 pp.
- Sobral, M. (1985) Alterações nomenclaturais em *Plinia* (Myrtaceae). *Boletim do Museu Botânico Municipal (Curitiba)* 63: 1–4.
- Sobral, M. (2003) *A família Myrtaceae no Rio Grande do Sul*. Unisinos, 215 pp.
- Sobral, M. & Stehmann, J.R. (2009) An analysis of new angiosperm species discoveries in Brazil (1990–2006). *Taxon* 58: 227–232.
- Sobral, M., Grippa, C., Souza, M.C., Aguiar, O.T., Bertonecello, R. & Guimarães, T.B. (2012) Fourteen new species and two taxonomic notes in Brazilian Myrtaceae. *Phytotaxa* 50: 19–50.  
<http://dx.doi.org/10.11646/phytotaxa.50.1.3>
- Sobral, M., Proença, C., Souza, M., Mazine, F., Lucas, E. (2015) Myrtaceae. In: *Lista de Espécies da Flora do Brasil*. Jardim Botânico do Rio de Janeiro. Available from: <http://floradobrasil.jbrj.gov.br/jabot/floradobrasil/FB171> (accessed 30 June 2015)
- Swartz, O. (1788) *Nova Genera et Species Plantarum*. 158 pp.
- Thiers, B. (2015) *Index Herbariorum: A global directory of public herbaria and associated staff*. New York Botanical Garden's Virtual Herbarium. Available from: <http://sweetgum.nybg.org/ih/>
- Vellozo, J.M.C. (1829) *Flora Fluminensis* 5: 1–135.