



## Original Paper

# Flora of Rio de Janeiro: Chrysobalanaceae

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### Abstract

This study comprehend the floristic treatment of Chrysobalanaceae from the state of Rio de Janeiro. Twenty-eight species, arranged into seven genera, are recorded. Two species, *Licania arianae* and *L. belemii*, are herein first reported for the state. Descriptions, photographs, illustrations, identification keys, distribution maps and comments are provided based on fieldwork and analysis of herbarium specimens. Among the 92 municipalities in the state of Rio de Janeiro, three stand out for the diversity of Chrysobalanaceae (Rio de Janeiro, Mangaratiba and Petrópolis), while in 47 of them, there are no records of Chrysobalanaceae. The Metropolitan Region has the largest number of specimens collected, as opposed to the Northwestern Region with the smallest number.

**Key words:** Atlantic Forest, Malpighiales, Neotropical flora, systematics, taxonomy.

### Resumo

O objetivo do presente estudo foi inventariar e caracterizar as espécies de Chrysobalanaceae do estado do Rio de Janeiro. Foram identificadas 28 espécies, circunscritas em 7 gêneros. Duas espécies são reportadas pela primeira vez para o estado: *Licania arianae* e *L. belemii*. São apresentadas descrições, fotografias, ilustrações, chaves de identificação, mapas de distribuição e comentários a partir da observação dos espécimes em campo e análise de material herborizado. Dentre os 92 municípios do estado três se destacam pela diversidade de táxons da família (Rio de Janeiro, Mangaratiba e Petrópolis) enquanto em 47 deles não há registro de ocorrência de Chrysobalanaceae. A Região Metropolitana possui o maior número de espécimes coletados, em contraposição a Região do Noroeste Fluminense, com o menor número.

**Palavras-chave:** Mata Atlântica, Malpighiales, flora Neotropical, sistemática, taxonomia.

### Introduction

Chrysobalanaceae, placed in Malpighiales (APG IV 2016), comprises 27 genera and ca. 545 species (Sothers *et al.* 2016; Sothers & Prance 2018). The family has a pantropical distribution, with most species occurring in the Neotropics (Prance & Sothers 2003a). In Brazil, it is represented by 280 species distributed in

four Brazilian biomes, having the Amazon forest as its center of diversity (Sothers *et al.* 2020). Of the 13 genera in Brazil, six were previously recorded in the state of Rio de Janeiro: *Chrysobalanus* L., *Couepia* Aubl., *Hirtella* L., *Leptobalanus* (Benth.) Sothers & Prance, *Licania* Aubl. and *Parinari* Aubl. (Sothers *et al.* 2020). The family is monophyletic supported by

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molecular and morphological evidence, defined by the combination of silica bodies, a receptacle tube, and a gynobasic style (Yakandawala *et al.* 2010). However, the intrafamilial circumscription is not fully clarified (Chave *et al.* 2020; Sothers *et al.* 2014, 2016).

Few taxonomic studies focusing on Chrysobalanaceae have been published for the state of Rio de Janeiro. Aside from the Flora do Brasil 2020 (Sothers *et al.* 2020), which provides data that can be filtered for the state, and the flora of Macaé de Cima (Neves 1996), Barros (2018) treated in her undergraduate thesis the 12 species of *Licania*, *Hymenopus*, and *Leptobalanus* in the state of Rio de Janeiro. Thus, aiming to address this knowledge gap, the present study presents the floristic treatment for the species of Chrysobalanaceae in the state of Rio de Janeiro. We provide an identification key, illustrations, photographs, descriptions, and comments for the species, as well as distribution maps of the species.

## Materials and Methods

Field expeditions were carried out between November 2018 and February 2020, using the walking method (Filgueiras *et al.* 1994). The material collected was processed following Mori *et al.* (1989) and deposited in the RB and NIT herbaria. The state of Rio de Janeiro herbaria (NIT, RB, RBR, R, UENF) were visited, and virtual herbarium specimens were also analyzed. The identifications were made with relevant bibliography (*e.g.*, Prance 1972, 1989; Prance & Sothers 2003a), original descriptions, comparison with types and herbarium specimens available online. The descriptive terminology followed Prance (1972), Harris & Harris (1994) and Radford *et al.* (1974). Flora do Brasil 2020 (<<http://floradobrasil.jbrj.gov.br/>>), The Plant List (<<http://www.theplantlist.org/>>) and Tropicos (<<http://www.tropicos.org/>>) were consulted to verify the scientific names. The names of the authors of the taxa followed the International Plant Name Index - IPNI (2020). The taxa cultivated in Rio de Janeiro were included in the identification key and marked with an asterisk (\*). The maps were made using the software DIVA-GIS version 7.5 (Hijmans *et al.* 2012).

## Results and Discussion

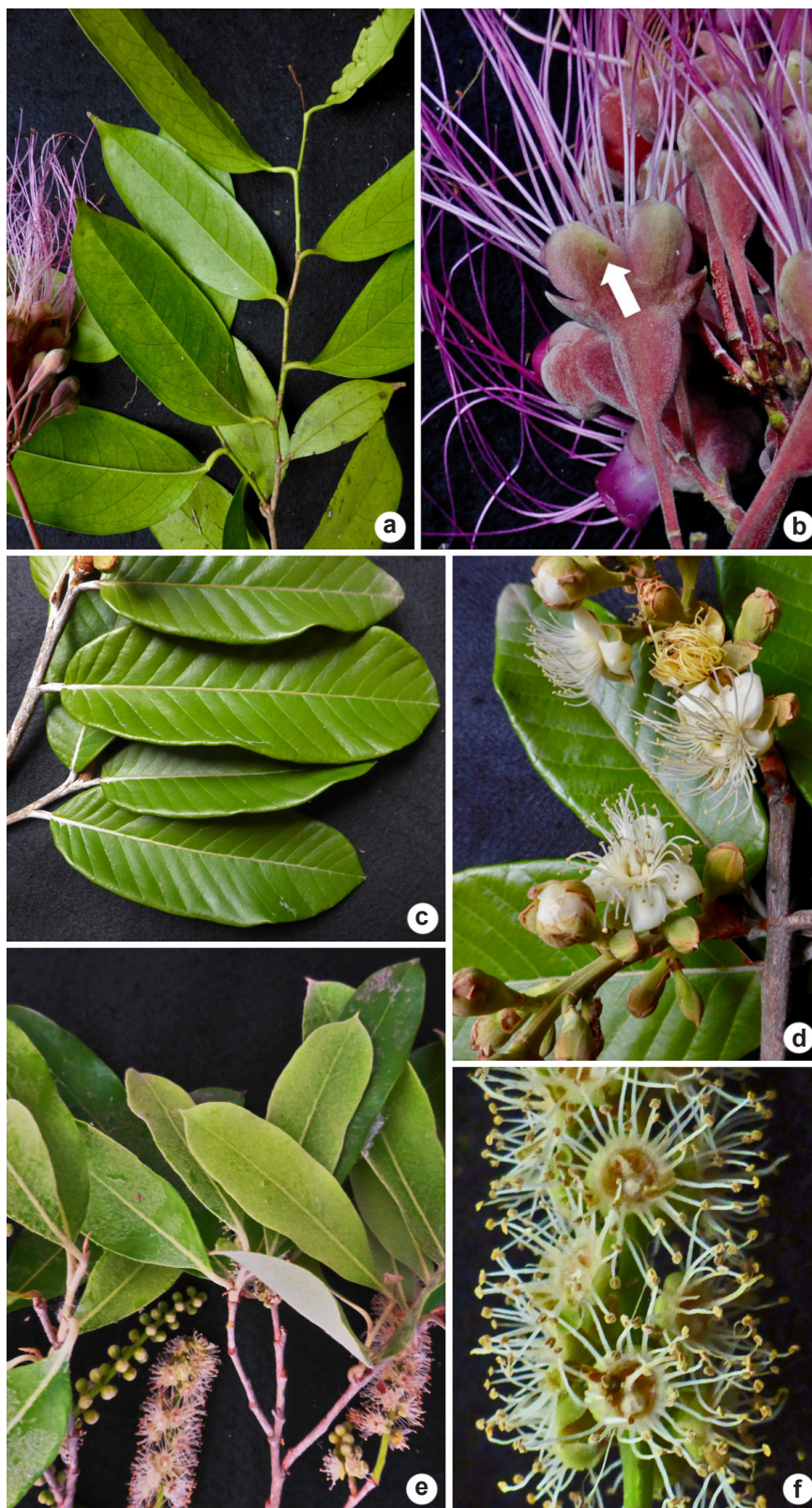
Twenty-eight species of Chrysobalanaceae were recorded for the state of Rio de Janeiro, arranged into seven genera. The largest percentage of the Chrysobalanaceae collections in the state (45%, in 12 municipalities) are from the metropolitan region, as opposed to the northwestern region (0.6%, in two municipalities). The municipalities of Rio de Janeiro, Mangaratiba, and Petrópolis have the highest number of recorded taxa, while no family records were found in 47 municipalities. *Licania kunthiana* Hook.f., *Chrysobalanus icaco* L. subsp. *icaco* and *Leptobalanus octandrus* (Hoffmanns. ex Roem. & Schult.) Sothers & Prance subsp. *octandrus* are the most collected species in the state.

Eight cultivated species were recorded for the state: *Acioa guianensis* Aubl., *A. longipendula* (Pilg.) Sothers & Prance (Fig. 1a-b), *Couepia bracteosa* Benth. (Fig. 1c-d), *C. rufa*, *C. subcordata* Benth. ex Hook. f., *Leptobalanus apetalus* (E.Mey.) Sothers & Prance var. *apetalus*, *Microdesmia rigida* (Benth.) Sothers & Prance, and *Moquilea tomentosa* Benth. (Fig. 1e-f).

### Taxonomic treatment

**Chrysobalanaceae** R.Br., Narr. Exped. Zaire 433. 1818.

Trees, shrubs or subshrubs. Leaves alternate, simple, entire; stipules caducous to persistent. Inflorescences racemose, paniculate, spikes or cymose, bracteate. Flowers usually 2-bracteolate, actinomorphic to zygomorphic, bisexual, perigynous; receptacle tubular, short to elongate, with disc forming a lining to the receptacle or an annular or shortly tubular structure at its mouth; sepals 5; petals 5 or absent; stamens 2–125(–300), inserted on disc margin, side or adnate to it, in a complete circle to unilateral; filaments free to connate at base, included to exserted; anthers dorsifixed, longitudinally dehiscent, glabrous; ovary superior, inserted at base, at middle or at the mouth of the receptacle, carpels 1–3, 1–2-locular, 2 ovules, erect; style filiform, gynobasic; stigma distinctly or indistinctly 3-lobed. Drupes dry or fleshy, endocarp thin and bony to thick and woody, frequently densely pubescent on the inside (Prance 2003; Prance & Sothers 2003a).



**Figure 1** – a-b. *Acioa longipendula* – a. branch; b. flowers, sepal glands in detail. c-d. *Couepia bracteosa* – c. branch; d. flowers. e-f. *Moquilea tomentosa* – e. lanate leaves, branch and inflorescence; f. flowers. Photos: M.A.N. Coelho.

### Identification key for the species of Chrysobalanaceae from the state of Rio de Janeiro

1. Leaves with stomatal cavities on abaxial surface.
  2. Leaves with 12–20 primary pair of veins.
    3. Leaves elliptic, apex acute to acuminate, margin with discoid glands; inflorescence paniculate ..... 7.1. *Parinari brasiliensis*
    - 3'. Leaves oblong to elliptic, apex rounded to retuse, margin eglandular; inflorescence racemose ..... *Microdesmia rigida*\*
  - 2'. Leaves with 5–10 primary pair of veins.
    4. Stomatal cavities inconspicuous; stamens exserted ..... 5.1. *Leptobalanus octandrus* subsp. *octandrus*
    - 4'. Stomatal cavities conspicuous; stamens included or the same length as sepals.
      5. Stipules rectangular to lanceolate, 5–6 mm long; inflorescence a panicle of cymes, floral receptacle campanulate ..... 6.1. *Licania arianeae*
      - 5'. Stipules triangular, 2–6 mm long; inflorescence racemose panicles, floral receptacle urceolate ..... 6.10. *Licania riedelii*
- 1'. Leaves without stomatal cavities on abaxial surface.
  6. Leaves concolorous.
    7. Leaves membranous ..... 6.3. *Licania glazioviana*
    - 7'. Leaves chartaceous to coriaceous.
      8. Leaves with 9 primary pair of veins; petiole 0.2–1 cm long; petals present ..... 4.1. *Hymenopus heteromorphus* var. *heteromorphus*
      - 8'. Leaves with 5 primary pair of veins; petiole 0.2–0.3 cm long; petals absent ..... 6.7. *Licania littoralis* var. *littoralis*
  - 6'. Leaves discolorous.
    9. Leaves glabrous on both sides.
      10. Flowers apetalous.
        11. Stamens exserted ..... *Leptobalanus apetalus* var. *apetalus*\*
        - 11'. Stamens included or the same length as sepals.
          12. Receptacle campanulate.
            13. Leaves with 4–6 primary pair of veins, petiole 3–5 mm long; stamens in an incomplete circle ..... 6.5. *Licania indurata*
            - 13'. Leaves with 5–9 primary pair of veins, petiole 0.2–1.5 cm long; stamens in a complete circle ..... 6.6. *Licania kunthiana*
          - 12'. Receptacle urceolate.
            14. Petiole 0.5–1.1 cm long, canaliculate; flower sessile ..... 6.11. *Licania spicata*
            - 14'. Petiole 3–5 mm long, terete; flower pedicellate ..... 6.9. *Licania nitida*
        - 10'. Flowers with petals.
          15. Stamens 3–6.
            16. Inflorescence paniculate.
              17. Leaves acute to acuminate, acumen 3.4–4.4 mm long, rarely mucronate; flowers 1–1.4 cm, pedicel ca. 4 mm long ..... 3.8. *Hirtella triandra* subsp. *punctulata*
              - 17'. Leaves acuminate, acumen 6–7 mm long; flowers 0.5–1.1 cm, pedicel 1–2 mm long ..... 3.2. *Hirtella barrosoi*
            - 16'. Inflorescence racemose.
              18. Bracts and bracteoles glandular, pedicel 6 mm long ..... 3.6. *Hirtella racemosa*
              - 18'. Bracts and bracteoles eglandular, pedicel 4–5 mm long ..... 3.7. *Hirtella sprucei*

19. Sepals unequal in size.  
 20. Leaves with apex acuminate, 0.9–1.2 cm; stamens ca. 30 ..... *Acioa longipendula*\*  
 20'. Leaves with apex acute to abruptly acuminate, 0.2–0.4 cm; stamens 10–12 .....  
 ..... *Acioa guianensis*\*
- 19'. Sepals equal in size.  
 21. Leaves widely elliptic to rounded, with 5–6 primary pair of veins .....  
 ..... 1.1. *Chrysobalanus icaco* subsp. *icaco*  
 21'. Leaves elliptic to oblong-elliptic, with 12–20 primary pair of veins ..... *Couepia bracteosa*\*
- 9'. Leaves pubescent on both sides or only abaxially.  
 22. Leaves lanceolate ..... 3.1. *Hirtella angustifolia*  
 22'. Leaves elliptic or oblong.  
 23. Flowers with petals.  
 24. Flowers with 3 to 6 stamens.  
 25. Stipules linear ..... 3.4. *Hirtella gracilipes*  
 25'. Stipules triangular to lanceolate.  
 26. Leaves 4.2–5.5 × 1.6–2.5 cm; petiole up to 4 mm long; flowers up to 1 cm long ..... 3.3. *Hirtella glaziovii*  
 26'. Leaves 5–13 × 2.4–5.2 cm; petiole over 5 mm long; flowers over 1 cm long ..... 3.5. *Hirtella hebeclada*
- 24'. Flowers with over 15 stamens.  
 27. Ovary inserted at base of receptacle ..... *Moquilea tomentosa*\*  
 27'. Ovary inserted near or at receptacle mouth.  
 28. Leaves membranous ..... *Couepia subcordata*\*  
 28'. Leaves chartaceous to coriaceous.  
 29. Stamens in a complete circle.  
 30. Leaf margins undulate and revolute ..... *Couepia rufa*\*  
 30'. Leaf margins plane.  
 31. Leaves oblong, 7–27 × 2.7–10 cm, 10–16 primary pair of veins ..... 2.5. *Couepia venosa*  
 31'. Leaves elliptic, 3.3–6.1 × 1–2.3 cm, 6–10 primary pair of veins ..... 2.3. *Couepia parvifolia*
- 29'. Stamens in an incomplete circle.  
 32. Leaves with apex abruptly acuminate, acumen 4–7 mm long .....  
 ..... 2.1. *Couepia monteclarensis*  
 32'. Leaves with apex rounded, acute or acuminate, acumen 2–5 mm long.  
 33. Leaves 4.7–6.9 × 2.2–4.6 cm, 11–17 primary pair of veins, petiole 4–9 mm long ..... 2.2. *Couepia ovalifolia*  
 33'. Leaves 9–16.7 × 4.1–9.5 cm, 15–18 primary pair of veins, petiole 0.7–1.5 cm long ..... 2.4. *Couepia schottii*
- 23'. Flowers apetalous.  
 34. Young branches glabrous ..... 6.8. *Licania micrantha* subsp. *micrantha*  
 34'. Young branches pubescent.  
 35. Stamens in a semi-circle ..... 6.2. *Licania belemii*  
 35'. Stamens in a complete circle ..... 6.4. *Licania hoehnei*

### 1. *Chrysobalanus* L.

Widely distributed genus, with 3 species (Prance & Sothers 2003a). In the state of Rio de Janeiro is represented by one taxon, *Chrysobalanus icaco* L. subsp. *icaco*.

#### 1.1. *Chrysobalanus icaco* L. subsp. *icaco*, Sp. Pl. 1: 513. 1753. Figs. 2a-c; 3

Shrubs, prostrate to erect, to 1.5 m tall; branches glabrous, lenticellate. Leaves widely elliptic to rounded, (3.5)5.3–7.5 × (3)4.9–5.6

cm, chartaceous, discoloured, base cuneate, apex rounded to subcordate, glabrous on both sides, eglandular, midrib glabrous on both sides, impressed adaxially and prominent abaxially, primary veins 5–6 pairs, glabrous; petiole 3–4.5 mm long, terete, glabrous, eglandular; stipules caducous, 2.8–4.7 mm long. Inflorescence axillary to terminal, raceme of cymules, puberulent; bracts

triangular, 3 mm long, puberulent; bracteoles triangular, ca. 2.5 mm long, puberulent. Flowers ca. 8 mm long, puberulent, pedicel 2 mm long; receptacle 2 mm long, pubescent inside; sepals 5, rounded to triangular, 4 mm long, pubescent inside; petals 5, oblong-lanceolate, 5–6 mm long, glabrous, white; stamens 16–18, 6–9 mm long, tomentose; ovary 1.5 mm, sericeous to tomentose;



**Figure 2** – a-c. *Chrysobalanus icaco* subsp. *icaco* – a. inflorescence; b. branches and fruit; c. shrub. Photos: a, b, c. N. Barros.

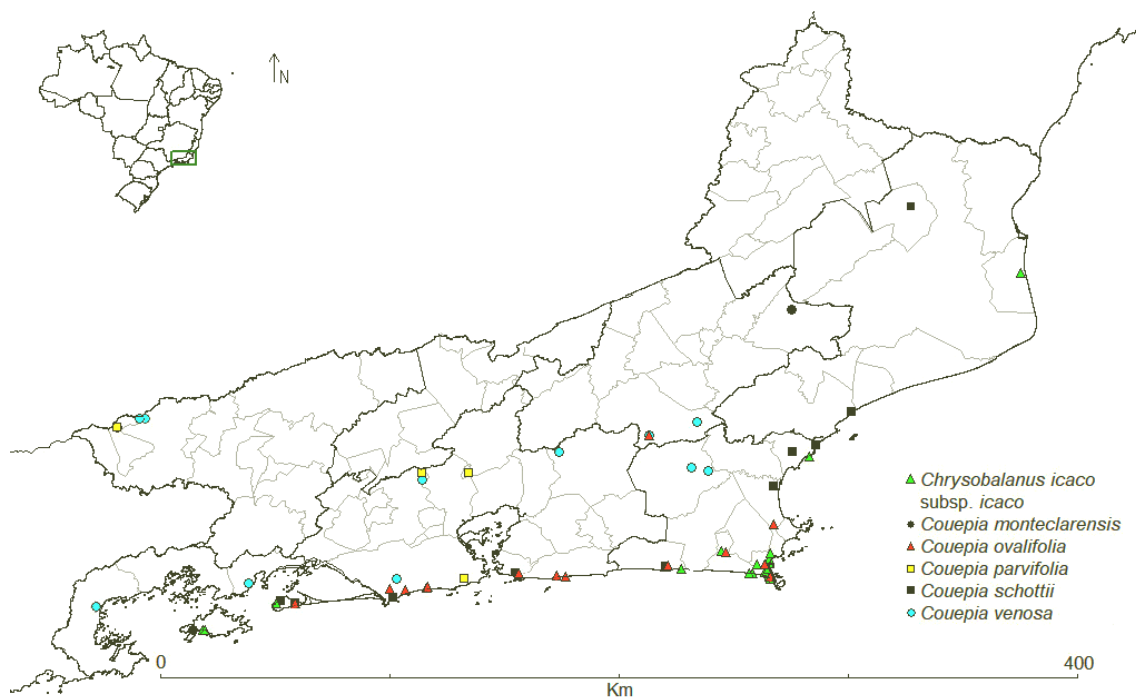
style 8 mm long, tomentose. Drupe ellipsoid, (1.9) 2.2–2.6 × 1.6–2 cm; epicarp glabrous, green, red or vinaceous, smooth *in vivo*, mesocarp white.

**Selected material:** Angra dos Reis, Reserva Biológica Estadual da Praia do Sul, Praia do Sul, vegetação halófila-psamófila, 28.VII.2012, fr., *A.J. Castelo 250* (RB). Araruama, Área de Proteção Ambiental de Massambaba, 7.V.2012, fr., *A.S.R. Carvalho AC111* (RB). Arraial do Cabo, road Cabo Frio town-Arraial do Cabo village, à beira da estrada, 9.VIII.1953, fl., fr., *F. Segadas-Vianna 757* (NY, R). Cabo Frio, Praia do Foguete, altura da Rua Walter Rollnan, 31.V.2013, fl., fr., *R.S. Fernandes 13* (RB). Casemiro de Abreu, Bairro Centro, Horta Medicinal (cult.), 14.I.2003, fr., *A.G. Christo 68* (RB). Mangaratiba, Ilha da Marambaia, Praia do Cutuca, formação pós praia, pequeno remanescente de vegetação, próximo as casas dos Caiçaras, 23.XII.2005, *L.F.T. Menezes 1470* (RBR). Rio das Ostras, Restinga de Itapebussus, restinga arbustiva, 19.VIII.1999, fr., *A. Lobão 443* (RB). Rio de Janeiro, Arboreto do Instituto de Pesquisas Jardim Botânico do Rio de Janeiro (cult.), 9.IV.2018, fr., *M. Nadruz 3355* (RB). São João da Barra, Reserva Particular do Patrimônio Natural Fazenda Caruara, 17.IV.2013, fl., fr., *A.D. Mattedi 269* (RB). Saquarema, Reserva Ecológica Estadual de Jacaraepiá, 27.XII.1994, *V.S. Fonseca 211* (RB).

*Chrysobalanus icaco* has a widespread distribution in Africa and the Americas, mainly in

coastal regions (Prance 1972; Prance & Sothers 2003a). The type variety is the only one that occurs in the American continent, recorded from the states of Amazonas to São Paulo (except Pernambuco and Roraima) in Brazil (Sothers & Prance 2020a; Prance & Sothers 2003a). In the state of Rio de Janeiro, it can be found in Angra dos Reis, Araruama, Arraial do Cabo, Cabo Frio, Mangaratiba, Rio das Ostras, São João da Barra, and Saquarema, in sandbanks (Fig. 3). It is frequent in non-flooded open shrubby formations (Araújo *et al.* 2009). Cultivated in Rio de Janeiro Botanical Garden and in a medicinal herb garden in Casemiro de Abreu. It has been collected in six protected areas: Área de Proteção Ambiental de Massambaba, Parque Estadual Costa do Sol, Reserva Biológica Estadual da Praia do Sul, Reserva Extrativista de Arraial do Cabo, Reserva Particular do Patrimônio Natural Fazenda Caruara. However, the predatory collection of this species leaves puts the populations that occur outside protected areas at risk.

This species is predominantly found in sand dunes, growing as prostrate or erect shrubs up to 10 m in diameter and up to 1.5 m tall. The rounded leaf-blade, glabrous on both sides, and the mature red to vinaceous fruits characterize and distinguish



**Figure 3** – *Chrysobalanus icaco* subsp. *icaco*, *Couepia monteclarensis*, *C. ovalifolia*, *C. parvifolia*, *C. schottii* and *C. venosa* distribution map in the state of Rio de Janeiro.

it from other species of Chrysobalanaceae. The leaf extract is commonly used to reduce glycemia in diabetic patients and is commercialized by growers in local markets (Silva & Peixoto 2009). Collected with flowers from January to May and August to October, and with fruits from January to May and July to October. The fruits are edible and much appreciated by locals.

Popular name: Abajerú, Abajirú, Bajurú, Bajirú.

## 2. *Couepia* Aubl.

Trees or shrubs. Leaves adaxially glabrous or densely lanate or arachnoid, abaxially pubescent, with 1 or 2 pairs of glands at base, sometimes with small glands at margin near the apex; petiole eglandular; stipules subulate or deltoid, usually persistent. Inflorescence usually a congested thyse, a panicle, less often a few-flowered spike or raceme, rarely flowers solitary; bracts and bracteoles eglandular. Flowers with cylindric, turbinate, or campanulate receptacle, usually glabrous inside except at throat; sepals and petals 5; stamens 10–125, usually inserted in a complete circle, rarely unilateral, with staminodes opposite, filaments exserted, usually free to base, glabrous; ovary 1(–2–3)-carpellate, inserted laterally at receptacle mouth, carpels 1-locular. Drupe with epicarp hard, thick and granular (Prance 2003; Prance & Sothers 2003b).

Genus with a Neotropical distribution comprising 64 species, 52 of which occurring in Brazil (Sothers & Prance 2020b). Five species occur in the state of Rio de Janeiro.

**2.1. *Couepia monteclarensis*** Prance, Fl. Neotrop. Monogr. 9S: 66, f. 14. 1989. Fig. 3

Tree, 9–12 m tall, DBH 10 cm, branches glabrous, lenticellate. Leaves oblong, 7.1–10 × 2.6–4.4 cm, chartaceous, discolorous, base acute, apex abruptly acuminate, acumen 4–7 mm long, adaxially glabrous, abaxially pubescent, midrib prominent abaxially and plane adaxially, glabrous, primary veins 7–10 pairs; petiole 4–9 mm long, glabrous, canaliculate, eglandular; stipules caducous (not observed). Inflorescence terminal, paniculate, pubescent; bracts and bracteoles caducous (not observed). Flowers 1.1–1.9 cm long, pubescent, pedicel 1–3 mm long; receptacle cylindrical, 4–6 mm long, glabrous except at throat (Prance & Sothers 2003b); sepals with apex rounded to acute; 2–4 mm long, pubescent;

petals caducous (not observed); stamens 18–20; inserted in 3/4 circle, filaments 0.6–1.1 cm long, glabrous, free or connate at base; ovary 1–2 mm, tomentulose, style 0.8–1.3 cm, tomentulose to ½ its length. Immature drupe ovoid to ellipsoid, sessile, 1.8–2.1 × 1.5–1.8 cm; epicarp smooth, glabrous, sepals and stamens persistent.

**Selected material:** Angra dos Reis, Ilha Grande, RBEPS, curso médio de Rio Capivari, 15.I.1986, fl., *R. Ribeiro 740* (GUA, K). Santa Maria Madalena, Serra da Furquilha, Fazenda da Furquilha, Parque Estadual do Desengano, 30.VI.1987, fr., *C. Farney 1451* (K, RB).

**Additional material:** BRAZIL. BAHIA: Wenceslau Guimarães, ca. 3 km W de Nova Esperança, a W Reserva Estadual Wenceslau Guimarães, 14.V.1992, fr., *W.W. Thomas 9326* (CEPEC, MBM). MINAS GERAIS: Caratinga, Fazenda Montes Claros, 19.II.1984, fl., *P.M. Andrade 113* (MBM, NY).

*Couepia monteclarensis* occurs in the states of Bahia, Minas Gerais, São Paulo, and Rio de Janeiro (Sothers & Prance 2020b). In Rio de Janeiro, it occurs in Angra dos Reis and Santa Maria Madalena (Fig. 3). Although classified as “Least Concern” (LC) for its overall distribution (CNCFlora 2012a), the species has few records in the state of Rio de Janeiro and occurs in only two conservation units, Reserva Biológica Estadual da Praia do Sul and Parque Estadual do Desengano.

*Couepia monteclarensis* can be recognized by its oblong leaves, with abruptly acuminate apex, flowers with an cylindrical receptacle, and 18–20 stamens in 3/4 circle. Collected with flowers in January and with fruits in June.

**2.2. *Couepia ovalifolia*** (Schott) Benth. ex Hook.f., in Martius, *Fl. bras.* 14(2): 48. 1867.

Basionym: *Chrysobalanus ovalifolius* Schott, in Spreng., *Syst. Veg.* 4(2): 406. 1827. Fig. 3

Shrub to subshrub, up to 1.7 m tall, young branches glabrous to pubescent, becoming glabrous with age, lenticellate. Leaves oblong, 4.7–9 × 2.2–4.6 cm, coriaceous, discolorous, base obtuse, subcordate or acute, apex rounded, acute or acuminate, acumen 2–3 mm long, adaxially glabrous or arachnoid, midrib plane adaxially, glabrous to pubescent, prominent abaxially, primary veins 11–17 pairs; petiole 4–9 mm, glabrous to pubescent, canaliculate; stipules caducous (not observed). Inflorescence terminal to subterminal, paniculate, pubescent; bracts 2, oblong to lanceolate, apex rounded to acute, 0.8–1 cm long, pubescent, caducous; bracteoles 2, lanceolate, 4 mm long, pubescent. Flowers



1.3–1.6 cm long, puberulent, pedicel 3–9 mm; receptacle cylindrical, 4–6 mm, glabrous, except at throat; sepals with rounded apex, 4–5 mm long, puberulent, reflexed; petals glabrous, margin ciliate; apex rounded; stamens 18–28, in a semi-circle, filaments 0.9–1.1 cm long, glabrous, free; ovary 2–3 mm, tomentulose, style 0.9–1.1 cm long, tomentulose at lower half. Drupe ellipsoid, sessile, 3.1–4.7 × 1.8–3.1 cm, epicarp rugose, glabrous.

**Selected material:** Araruama, restinga de vegetação aberta de moitas, em frente ao loteamento Sabiá, 12.VIII.2008, fl., *A.C.S. Cavalcanti 234* (RB, SPF). Arraial do Cabo, Reserva Ecológica Estadual de Massambaba, próximo à Lagoa Salgada, 25.X.1993, fl., *J. Fontella 3100* (K, RB). Cabo Frio, 13.X.1953, fl., *F. Segadas-Vianna 1041* (MG, SPF). Mangaratiba, Ilha de Marambaia, área de moitas, 9.X.2003, fl., fr., *D.N. Castro 23* (RBR). Maricá, Barra de Maricá, 22.IV.1985, fl., *H.C. de Lima 2584* (RB). Niterói, Dans les sables de tahipu, 18.VI.1867, fl., *A.F.M. Glaziou 1384* (P). Nova Friburgo, Alto Macahé, 20.XII.1887, fl., *A.F.M. Glaziou 16761* (P). Rio de Janeiro, próximo ao Recreio dos Bandeirantes, 22.X.1964, fl., *W. Hoehne 5840* (US, RB, SPF, ESA). Saquarema, Reserva Ecológica Estadual de Jacarepiá, 13.V.1993, fr., *J. Fontella 3084* (RB).

*Couepia ovalifolia* occurs in the states of Bahia, Espírito Santo, Minas Gerais, and Rio de Janeiro (Sothers & Prance 2020b). In the state of Rio de Janeiro, it occurs in Araruama, Arraial do Cabo, Cabo Frio, Mangaratiba, Maricá, Niterói, Nova Friburgo, Rio de Janeiro, and Saquarema (Fig. 3). Has been collected in two conservation units: Parque Estadual da Costa do Sol and Área de Proteção Ambiental de Massambaba.

*Couepia ovalifolia* and *C. schottii* are part of the “*C. ovalifolia* species group”, being morphologically distinguished by a few characteristics such as the smaller leaf-blades in *C. ovalifolia* (4.7–9 × 2.2–4.6 cm vs. 9–16.7 × 4.1–9.5 cm), the number of primary leaf vein pairs (11–17 vs. 15–18), and shorter petiole (0.4–0.9 cm long vs. 0.7–1.5 cm long) (Prance 1972). However, the overlap between these characters is frequent, which makes it difficult to distinguish both species. Studies on other characters are necessary for a better delimitation of these taxa. Collected with flowers in April, June, August, October and December, and with fruits in January, March, May, July, September and November.

**2.3. *Couepia parvifolia*** Prance, Fl. Neotrop. Monogr. 9: 258–259. 1972. Fig. 3

Tree, 6–18 m tall, DBH 10–16 cm, branches glabrous, lenticellate. Leaves elliptic, 3.3–6.1 ×

1–2.3 cm, chartaceous, discolorous, base acute, apex acuminate, acumen 5–8 mm long, adaxially glabrous, abaxially pubescent, midrib prominent and pubescent abaxially, plane and glabrous adaxially, primary veins 6–10 pairs; petiole 4–8 mm long, glabrous to pubescent, canaliculate, eglandular; stipules 2, 3–4 mm long, narrowly lanceolate, chartaceous, glabrous, caducous. Inflorescence terminal, paniculate, pubescent; bracts and bracteoles caducous (not observed). Floral bud 5–8 mm long, pubescent, pedicel 1–2 mm long; receptacle campanulate, 2–4 mm long; sepals rounded (Prance 1972); petals densely pubescent, margin ciliate (Prance 1972); stamens 28, in a complete circle (Prance 1972), filaments free; ovary densely lanate (Prance 1972). Drupe ellipsoid, sessile, 2.8–3 × 1.9–2.1 cm, epicarp rugose, glabrous, sepals and stamens persistent.

**Selected material:** Itatiaia, picada para Planalto, 1.III.1941, *W. Duarte Barros 219* (RB). Miguel Pereira, Reserva Biológica do Tinguá, Estrada do Orbel II, próximo ao 28, 3.VIII.2016, *H.C. de Lima 8323* (RB). Petrópolis, estrada Rio de Janeiro-Petrópolis, km 60, 12.X.1948, fl., *A.P. Duarte 1508* (RB, NY). Rio de Janeiro, Alto da Boa Vista, estrada da Vista Chinesa, próximo à curva do km 1, 9.XI.2000, fr., *C.A.L. Oliveira 1713* (K, SPF).

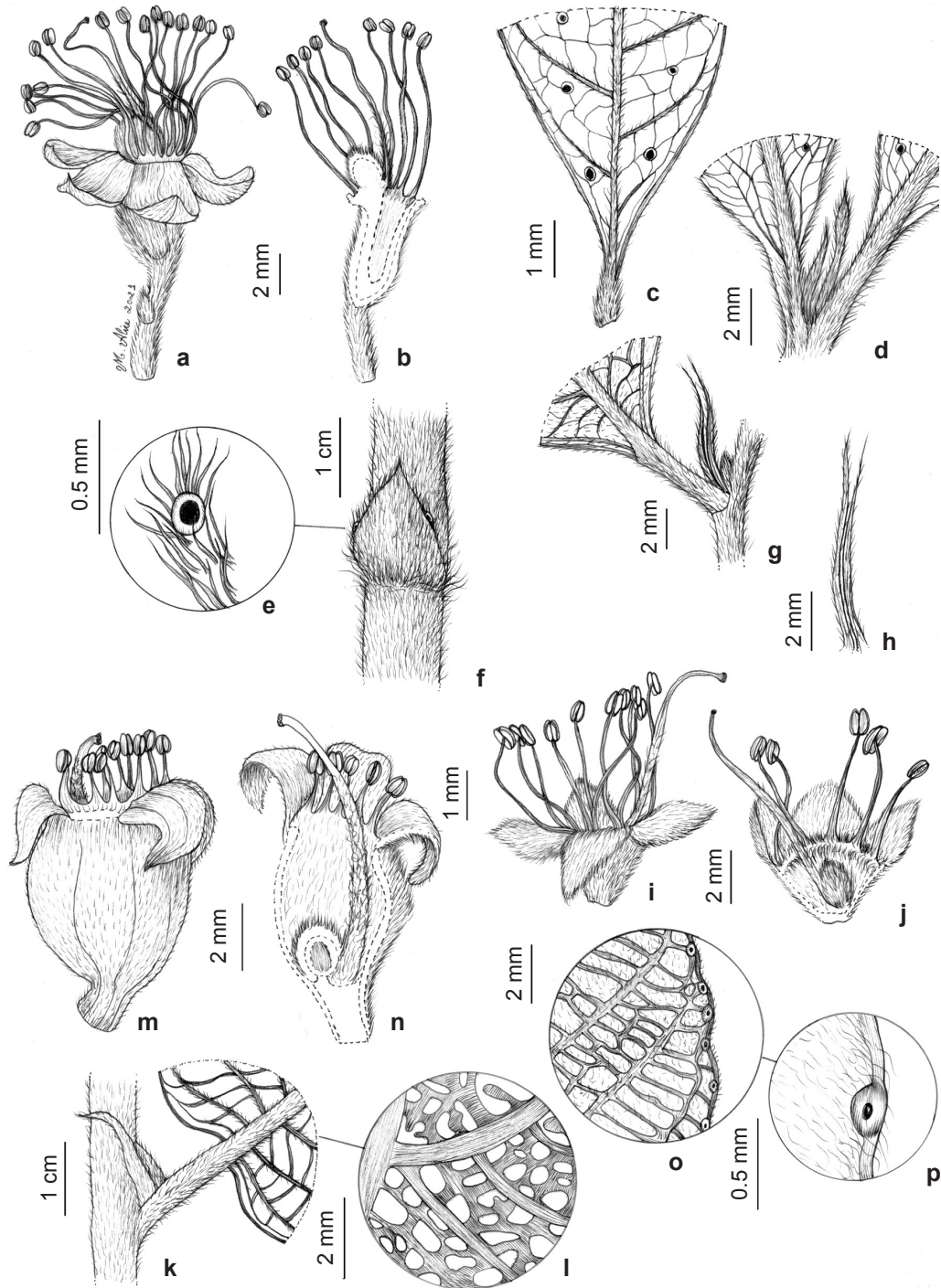
*Couepia parvifolia* is endemic to the state of Rio de Janeiro (Sothers & Prance 2020b) and occurs in Itatiaia, Petrópolis, Rio de Janeiro, and Miguel Pereira (Fig. 3) municipalities. The species is classified as “Endangered” (EN) (Guimarães *et al.* 2018).

*Couepia parvifolia* is very distinct from the remaining species of the genus, by its smaller leaves (3.3–6.1 × 1–2.3 cm), elliptical, with acute base, and acuminate apex. Collected with flowers in October and with fruits in November.

Due to the small number of material with flowers, the description was supplemented with the species original description (Prance 1972).

**2.4. *Couepia schottii*** Fritsch, Ann. K.K. Naturhist. Hofmus. 5: 13. 1890. Figs. 3; 4a-b

Tree, 7–18 m tall, DBH 35–85 cm; branches glabrous, lenticellate. Leaves oblong, 9–16.7 × 4.1–9.5 cm, coriaceous, discolorous, base obtuse to subcordate, apex acuminate, acumen 2–5 mm long, adaxially glabrous, abaxially tomentulose to glabrous, midrib plane to slightly canaliculate adaxially, prominent abaxially, glabrous on both sides, primary veins 15–18 pairs; petiole 0.7–1.5 cm long, glabrous to pubescent, canaliculate, eglandular; stipules caducous (not observed).



**Figure 4** – a-b. *Couepia schottii* – a. flower; b. longitudinal section of flower. c-d. *Hirtella glaziovii* – c. glands on underside of leaf; d. stipules. e-f. *Hirtella hebeclada* – e. bracteoles with glands; f. glands in detail. g-j. *Leptobalanus octandrus* subsp. *octandrus* – g. branch, leaf underside with stomatal cavities, stipules in evidence; h. detail of stipules; i. flower; j. longitudinal section of flower. k-l. *Licania arianaeae* – k. stipules and leaf underside with stomatal cavities; l. detail of underside of leaf with stomatal cavities. m-n. *Licania riedelii* – m. flower; n. longitudinal section of flower, ovary inserted at receptacle base. o-p. *Parinari brasiliensis* – o. leaf margin with glands; p. glands in detail. (a-b. C. Farney & D.B. Gonçalves 3558; c-d. Markgraf & Brade 3096; e-f. A. Frazão RB15511; g-h. A. Oliveira et al. RB346193; i-j. S.V.A. Pessoa 905; k-l. H.C. Lima et al. 8679; m-n. C.H.R. Paula et al. 727; o-p. Schwacke 4256).

Inflorescence terminal to subterminal, paniculate, pubescent; bracts in pairs, lanceolate to rounded, 5–9 mm long, pubescent, caducous; bracteoles 2, triangular, 2 mm long, pubescent, caducous. Flowers 0.9–1.5 cm long, pubescent, pedicel 3–5 mm long; receptacle cylindrical, 4–7 mm long, glabrous inside except at throat; sepals with apex rounded to acute, 3–6 mm long, pubescent, usually reflexed; petals with ciliate margin, 4–5 mm long; stamens 16–26, inserted in a semicircle (Prance 1972), filaments 6–1.2 cm long, glabrous, free, tangled; ovary 2–4 mm, tomentulose, style 0.8–1 cm, tomentulose at lower half. Drupe ellipsoid, sessile, 2.5–3.4 × 2–2.9 cm, epicarp smooth to rugose, glabrous, sepals and stamens persistent.

**Selected material:** Cabo Frio, 2° Distrito, Tamoios, Parque Ecológico Municipal do Mico Leão Dourado, 26.X.2003, *D. Fernandes 969* (RB). Cardoso Moreira, localidade de Sacramento, em mata do assentamento do Inkra, 26.XI.2017, fl., *I.G. Costa 932* (RB). Macaé, loteamento Lagomar, na área de transição para a mata periodicamente inundável, 29.XI.1994, fl., *C. Farney 3440* (RB, MBM). Mangaratiba, Ilha de Marambaia, caminho de heliporto floresta, 22.IV.2005, fr., *D.C. Carvalho 23* (RBR). Niterói, 7.VIII.1874, fl., *A.F.M. Glaziou 7876* (US, P). Rio das Ostras, balneário Morada das Graças, remanescente sobre solo arenoso-argiloso, 6.XII.2008, fl., *R.D. Ribeiro 1064* (RB). Rio de Janeiro, morro do Mundo Novo, Botafogo, 15.XI.1920, fl., *A. Ducke* (RB15135). Saquarema, restinga de Ipitangas, próxima ao loteamento Vilatur. Saquarema, 22.XI.1986, fl., *C. Farney 1271* (RB).

*Couepia schottii* occurs in the states of Bahia, Espírito Santo and Rio de Janeiro (Sothers & Prance 2020b; Prance & Sothers 2003b). In the state of Rio de Janeiro, it occurs in Cabo Frio, Cardoso Moreira, Macaé, Mangaratiba, Niterói, Rio das Ostras, Rio de Janeiro, and Saquarema (Fig. 3), and it is typically found in sand dunes that suffer intense area suppression by the real estate expansion in these environments. The species is classified as “Endangered” (EN) in Brazil (Amorim *et al.* 2013).

*Couepia schottii* is similar to *C. ovalifolia*, as above-mentioned. Collected with flowers in August, November and December, and with fruits in February, April, and December.

**2.5. *Couepia venosa*** Prance, Fl. Neotrop. Monogr. 9: 251. 1972. Fig. 3

Tree, 4–13 m, DBH 5–9.5 cm; branches glabrous, lenticellate. Leaves oblong, 7–27 × 2.7–10 cm, chartaceous to coriaceous, discolorous, base obtuse, apex acute to acuminate, acumen 0.4–1.9 cm long, adaxially glabrous, abaxially pubescent,

midrib canaliculate, glabrous, prominent and pubescent, primary veins 10–16 pairs; petiole 0.6–1 cm long, glabrous to pubescent, terete to canaliculate, eglandular; stipules 2, 6 mm long, linear, chartaceous, glabrous, caducous. Inflorescence terminal, paniculate, pubescent to tomentulose; bracts triangular, 4 mm long, pubescent, caducous; bracteoles 2, triangular, 3 mm long, pubescent, caducous. Flowers 1.4–2.2 cm long, pubescent, pedicel 2 mm; receptacle cylindrical, 4–6 mm; sepals rounded, 4–6 mm, pubescent; petals pubescent on the outside; stamens 37–50 (Prance 1972), inserted in a complete circle, filaments 1 cm long, glabrous, free; ovary tomentose, style pubescent in almost its entire length. Drupe ellipsoid, sessile, 2.1–6 × 0.9–3.9 cm; epicarp smooth to rugose, sparsely pubescent; sepals and stamens persistent.

**Selected material:** Guapimirim, Estação Ecológica Estadual de Paraíso, 27.XII.1984, *G. Martinelli 10614* (RB). Itatiaia, Parque Nacional de Itatiaia, perto de Mauá, *C. Mello* (RB66517). Mangaratiba, Reserva Ecológica do Rio das Pedras, coletada na margem do Rio Grande, 23.III.1997, fr., *J.A. Lira Neto 552* (RB). Nova Friburgo, Reserva Ecológica Municipal de Macaé de Cima, picada para Pedra Bicuda, 28.XII.1989, fl., *M.A. Nadruz 549* (RB, NY, V, SP, UEC). Nova Iguaçu, Reserva Biológica do Tinguá, 26.V.1993, *M.M.T. Rosa* (RBR22257). Paraty, rodovia BR-101, km 164, fazenda Taquarí, Sertão do Taquarí, próximo ao riacho Juçará, 4.VII.1989, fl., fr., *H.C. de Lima 3632* (RB, K). Resende, Bosque do Visconde, trilha da família, Parque Estadual da Pedra Selada, 20.IV.2018, fr., *C. Baez 1650* (RB, RBR). Rio de Janeiro, Parque Estadual da Pedra Branca, est. da Toca Grande, Ilha de Guaratiba, inventário complementar F55-72., 11.IV.2014, *T.P.P. Alverga* (RBR43500). Silva Jardim, distrito de Peclas, Fazenda Santa Helena, 3.IV.2007, *A.G. Christo 586* (RB).

*Couepia venosa* occurs in the states of Minas Gerais, São Paulo and Rio de Janeiro (Sothers & Prance 2020b). In the latter, occurs in Guapimirim, Itatiaia, Mangaratiba, Nova Iguaçu, Paraty, Resende, Rio de Janeiro, Silva Jardim, and Nova Friburgo (Fig. 3). It has been collected in five conservation units, Reserva Biológica de Poço das Antas, Reserva Biológica do Tinguá, Área de Proteção Ambiental de Macaé de Cima, Parque Estadual da Pedra Branca, and Parque Estadual da Pedra Selada.

*Couepia venosa* is characterized by its oblong leaves, with an obtuse base, 10–16 primary leaf veins, and numerous stamens (37–50). Collected with flowers in July and December, and with fruits in April, May, July, September, and December.

Popular name: Berre (*H.C. de Lima 3685*), Milho-cozido [*Cunha Mello (RB66517)*].

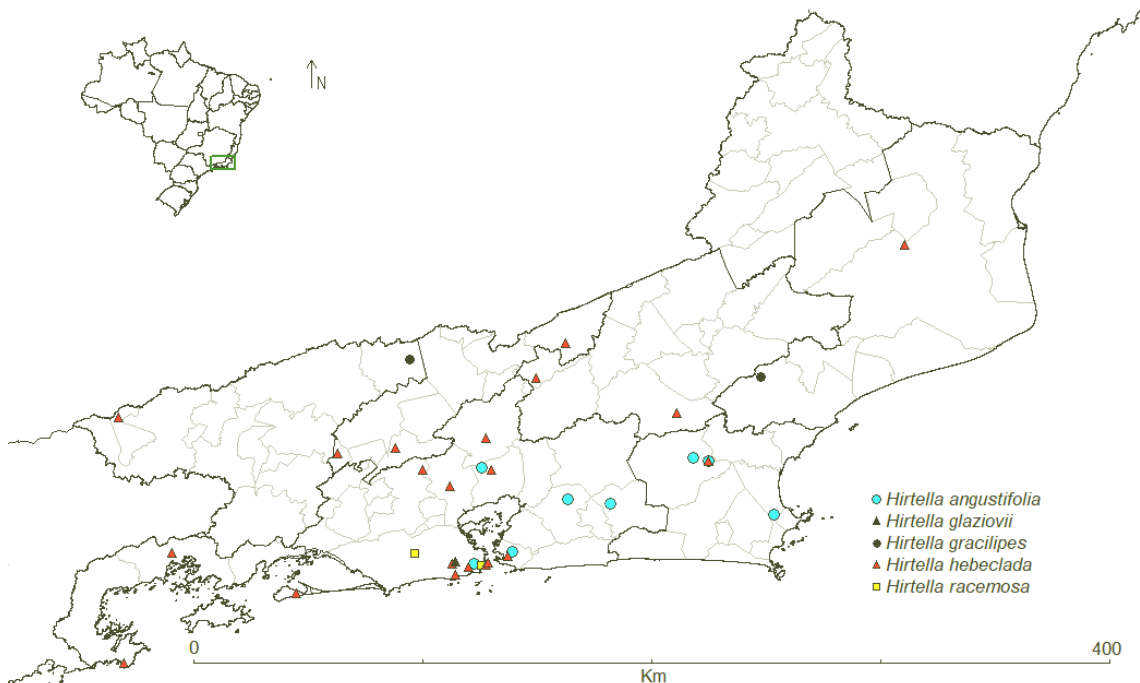
### 3. *Hirtella* L.

Trees or shrubs. Leaves glabrous, sparsely strigose or hirsute, frequently with small discoid glands, submarginal or on the leaf-blade; petiole eglandular. Inflorescence raceme, thyrses, corymb or panicle; bracts and bracteoles not enclosing flower buds in small groups, sometimes with sessile or stipitate glands. Flowers zygomorphic, pedicellate, receptacle-tube subcampanulate to narrowly cylindrical, slightly gibbose, usually glabrous inside except near the throat; sepals 5, subequal, acute, sometimes with sessile or stipitate glands at margin; petals 5, shorter or equaling sepals; stamens 3–9(–17), far exserted, filaments free, glabrous, usually unilateral, opposite to small staminodes; ovary 1-carpellate, 1-locular, inserted at receptacle mouth, style filiform, exserted. Drupe fleshy, usually with lines of weakness, mesocarp exiguous, endocarp smooth, thin, non-granular and bony (Prance 2003; Prance & Sothers 2003b).

The genus comprises 110 species, mostly distributed in the Neotropics (Asprino 2020; Sothers & Prance 2018). Eight species are recorded for the state of Rio de Janeiro.

**3.1. *Hirtella angustifolia*** Schott ex Spreng., Syst. Veg. 4(2): 341. 1827. Fig. 5

Tree, 3–5.5 m tall, DBH ca. 6 cm; young branches sparsely hispid, becoming glabrous with age, sparsely lenticellate. Leaves lanceolate, 6.5–9.5(–13) × 2.2–3 cm, chartaceous, discolorous, base cuneate to subcordate, apex acuminate, acumen 0.5–1.5 cm long, adaxially glabrous to hispid, abaxially sparsely hispid, midrib prominent, glabrous to hispid, primary veins 6–11 pairs, eglandular; petiole 2–5 mm long, hispid, terete, eglandular; stipules 2, linear, 6–7 mm long, hispid, persistent, eglandular. Inflorescence subterminal to terminal, racemose, hispid; bracts 1, triangular, ca. 2–5 mm long, hispid, persistent, eglandular; bracteoles 2 pairs, triangular, ca. 1–3 mm long, hispid, persistent, eglandular. Flowers 2–2.2 cm long, hirsute, pedicel 1.2–1.7 cm long; receptacle campanulate, 1.5–2.5 mm long, hirsute at throat; sepals triangular to rounded, 3–5 mm long, reflexed, hirsute abaxially; petals rounded, 4–5 mm long, glabrous, eglandular; stamens 4–8, inserted unilaterally, filaments 1.1–1.4 cm long, purple; ovary 1.5 mm, hirsute; style 1–1.1 cm long, basal 3/4 hirsute. Immature drupe ellipsoid, 1.6 × 0.7 cm, epicarp longitudinally striate, sparsely sericeous, sepals and stamens persistent.



**Figure 5** – *Hirtella angustifolia*, *H. glaziovii*, *H. gracilipes*, *H. hebeclada* and *H. racemosa* distribution map in the state of Rio de Janeiro.

**Selected material:** Cabo Frio, IX.1881, fl., *A.F.M. Glaziou 7149* (R). Itaboraí, entre Sambaetiba e Porto das Caixas, 13.VIII.1880, fl., *A.F.M. Glaziou 11941* (R, P). Magé, estrada do Porto da Estrella, 20.X.1925, fl., *A. Ducke* (RB19175; US1442124; U1206730). Niterói, Pendotiba, Matapaca, Mata do Ministro, 26.X.2018, fr., *T.C. Soares 81* (RB). Rio Bonito, entre aldeia de São Pedro e Rio Bonito, fl., 22.IX.1881, *A.F.M. Glaziou 12658* (P). Rio de Janeiro, Corcovado, fl., *G.H. von Langsdorff* (NY378161). Silva Jardim, Reserva Biológica de Poço das Antas, trilha para Fazenda Portuense, próximo à entrada do cajueiro, 28.XI.1992, fl., *H.C. de Lima 4539* (RB).

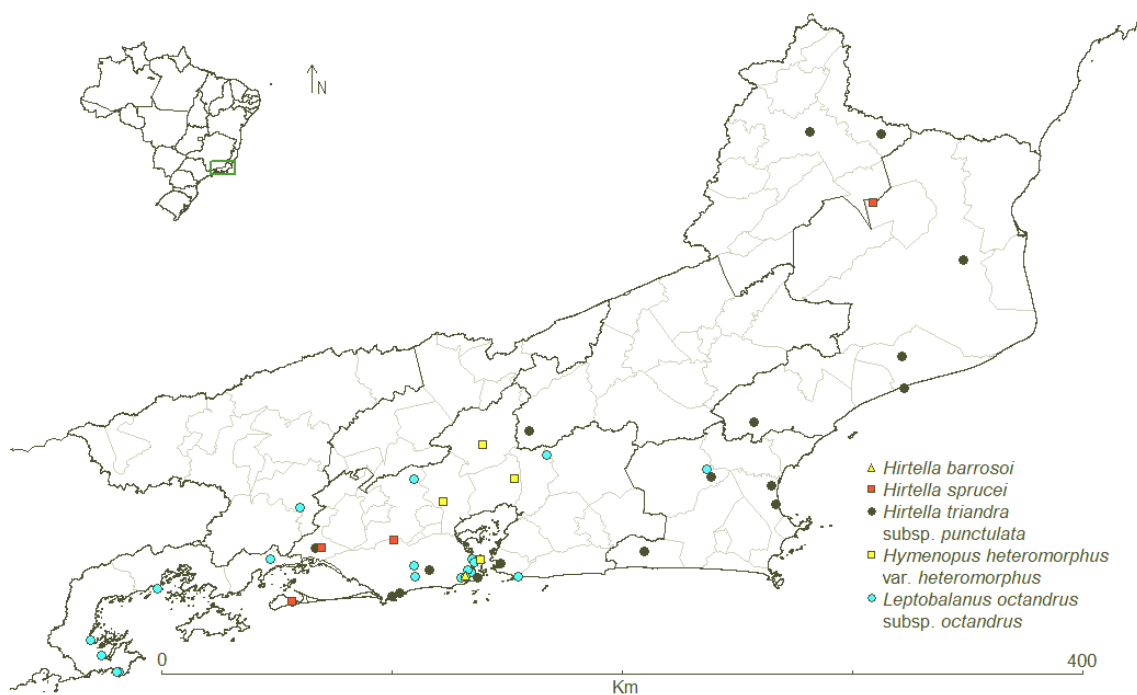
*Hirtella angustifolia* occurs in the states of Bahia, Espírito Santo, São Paulo, and Rio de Janeiro (Asprino 2020). In the state of Rio de Janeiro, it occurs in Cabo Frio, Itaboraí, Magé, Niterói, Rio Bonito, Rio de Janeiro, and Silva Jardim municipalities (Fig. 5). Although the species is well represented by historical collections (Glaziou, Langsdorff, Schott, and Ducke, with 5 specimens), there are only three materials from the last 30 years, which may indicate data deficiency or rarity. It has been collected in two conservation units: Parque Nacional da Tijuca and Reserva Biológica de Poço das Antas.

*Hirtella angustifolia* can be distinguished by the lanceolate leaves and hispid indumentum on the

young branches and inflorescence. Collected with flowers in August, September, and November, and with fruits in October.

**3.2. *Hirtella barrosoi*** Prance, Fl. Neotrop. Monogr. 9: 298. 1972. Fig. 6

Tree, 5–7 m tall; branches glabrous, lenticellate. Leaves elliptic, 4.9–7 × 1.3–2.3 cm, chartaceous, discolorous, base acute, apex acuminate, acumen 6–7 mm long, glabrous on both sides, midrib slightly prominent and glabrous on both sides, primary veins 5–7 pairs, eglandular; petiole 2–4 mm long, glabrous, terete, eglandular; stipules caducous (not observed). Inflorescence terminal to axillary, paniculate, glabrous to pubescent; bracts 2, triangular, ca. 1 mm, puberulous, eglandular; bracteoles 2, 0.5–1 mm, triangular, puberulous, eglandular. Flowers 0.5–1.1 cm long, pedicel 1–2 mm long, pubescent; receptacle campanulate, 2 mm long, glabrous except at throat; sepals ca. 3 mm long, reflexed, apex acute to rounded, pubescent; petals ca. 3 mm long, rounded, glabrous; stamens 3, inserted unilaterally, filaments free; ovary ca. 2 mm, sericeous, style ca. 3–7 mm long, sericeous at lower half. Drupe ellipsoid, 2–2.3 × 1.5–1.6 cm, epicarp longitudinally striate, glabrous, mesocarp thin, endocarp thin.



**Figure 6** – *Hirtella barrosoi*, *H. sprucei*, *H. triandra* subsp. *punctulata*, *Hymenopus heteromorphus* var. *heteromorphus* and *Leptobalanus octandrus* subsp. *octandrus* distribution map in the state of Rio de Janeiro.

**Selected material:** Rio de Janeiro, mata do Teixeira Borges, perto da sede do Horto Florestal, 26.V.1928, fl., *Pessoal do Horto Florestal* (RB136922, NY01085719, MBM347331, P00753692, MO2195584, B100464818, SPF187423).

*Hirtella barrosoi* occurs in the states of Espírito Santo and Rio de Janeiro (Asprino 2020). In the state of Rio de Janeiro, it occurs only in the municipality of Rio de Janeiro (Fig. 6), recorded only by two collections from the 1920s and 1930s in a conservation unit under pressure from invasions and expansion of the city, which poses a risk to the species' survival.

*Hirtella barrosoi* can be distinguished by its glabrous branches and leaves, elliptical leaves with acuminate apex, and paniculate inflorescence. Collected with flowers in May and with fruits in August.

**3.3. *Hirtella glaziovii*** Taub., Bot. Jahrb. Syst. 15 (Beibl. 34): 8. 1892. Figs. 4c-d; 5

Tree, up to 4 m tall, young branches hirsute, becoming glabrous with age, lenticellate. Leaves elliptic, 4.2–5.5 × 1.6–2.5 cm, chartaceous to coriaceous, discolorous, base acute, apex acute, sparsely hirsute to glabrescent on both sides, midrib hirsute to glabrescent, prominent on both sides, primary veins 4–6 pairs, hirsute abaxially, with discoid glands on the abaxial basal half; petiole 1–4 mm long, hirsute, terete, eglandular; stipules 2, 2.5–3 mm long, lanceolate, chartaceous, tomentulose, persistent to subsistent. Inflorescence terminal to axillary, racemose, tomentose; bracts 2, bracteoles 2, lanceolate, 2–3 mm long, tomentulose, eglandular. Flowers 0.8–1 cm long, tomentulose, pedicel 3 mm long; receptacle campanulate, 2–3 mm long, glabrous except at throat; sepals 4 mm long, tomentulose; petals 3 mm long, glabrous; stamens 3–4, exserted, inserted unilaterally, filaments ca. 5–7 mm long, free; ovary ca. 3 mm long, tomentose, style ca. 5 mm long, basal half tomentose. Drupe globose, sessile, 1.1 × 0.9–1.1 cm; epicarp smooth, tomentulose.

**Selected material:** Rio de Janeiro, Pico da Tijuca, 7.XI.1871, fl., *A.F.M. Glaziou 4946* (K, P, NY, S, C).

**Additional material:** BRAZIL. SÃO PAULO: Salesópolis, Boracéia, 28.I.1949, fr., *M. Kuhlmann 1748* (NY).

*Hirtella glaziovii* occurs in the states of São Paulo and Rio de Janeiro (Asprino 2020). In the state of Rio de Janeiro, it is only known from the municipality of Rio de Janeiro (Fig. 5). In addition to the scarcity of records, the most recent collection is from 1938, so a focused collecting effort is

needed to evaluate the species' conservation status.

*Hirtella glaziovii* can be distinguished by the combination of leaves with acute apex, abaxially with discoid glands, and tomentose inflorescence. Collected with flowers in October and November.

**3.4. *Hirtella gracilipes*** (Hook.f.) Prance, Fl. Neotrop. Monogr. 9: 323. 1972.

Basionym: *Hirtella americana* var. *gracilipes* Hook.f., in Martius, *Fl. bras.* 14(2): 34. 1867.

Fig. 5

Tree, up to 5 m tall; young branches pubescent to hirsute, becoming glabrous with age, lenticellate. Leaves elliptic, 5–6 × 1.9–2.6 cm, chartaceous, discolorous, base acute, apex acuminate, acumen 6–9 mm long, glabrous adaxially, sparsely hirsute to glabrescent abaxially, midrib prominent, hirsute on both sides, primary veins 5–7 pairs, abaxially with discoid glands; petiole 2–2.5 mm long, terete, hirsute, eglandular; stipules linear, 4 mm long, hirsute, persistent to sub-persistent, marginal glands present or absent. Inflorescence axillary to terminal, raceme, hirsute; bracts 1, 1.5–2 mm long, hirsute, lanceolate, glands present or absent; bracteoles 2, 1 mm long, hirsute, lanceolate, glands present or absent. Flowers 5–7 mm long, pubescent, pedicellate, pedicel 0.8–1 cm long, pubescent to sparsely hirsute; receptacle campanulate, 1 mm long, glabrous except at throat; sepals acute, 2–3 mm long, pubescent on the inside, petals rounded, 3–4 mm long, glabrous; stamens 3, inserted unilaterally, filaments 4–7 mm long; ovary 1.5 mm long, hirsute, style 5 mm long, basal 3/4 hirsute. Drupe ellipsoid, sessile, 1.2–1.4 × 0.5–0.6 cm, epicarp longitudinally striate, glabrous.

**Selected material:** Macaé, Pico do Frade de Macaé, 16.IX.1982, fl., *G. Martinelli 8739* (RB, NY). Rio das Flores, 29.IX.2015, fl., *L. Silva 711* (RB).

**Additional material:** BRAZIL. MINAS GERAIS: Vale do Rio Araguari, Fazenda Barreiro, 21.X.1992, fr., *A.L.P. Mota 1427* (HUFU). PIAUÍ: fl., *G. Gardner 2565* (K, P, US).

*Hirtella gracilipes* is recorded for Bolivia, Brazil, Ecuador, and Peru (Prance & Sothers 2003b). In Brazil it occurs in the states of Bahia, Distrito Federal, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Piauí, Rio de Janeiro, Rondônia, São Paulo, and Tocantins (Asprino 2020). In the state of Rio de Janeiro, it occurs only in Macaé and Rio das Flores (Fig. 5). Despite the species' widespread distribution in South America, there are few records of it in the state of Rio de Janeiro, which suggests greater

concern regarding its conservation.

*Hirtella gracilipes* is similar to *H. hebeclada* due to its elliptic leaves with discoid glands, but are distinguished by the smaller leaves (5–6 × 1.9–2.6 cm vs. 5–13 × 2.4–5.2 cm), longer acumen (6–9 mm long vs. 1–5 mm long), the number of primary vein pairs (5–7 vs. 8–9), and linear stipule. Collected with flowers in September.

**3.5. *Hirtella hebeclada* Moric. ex DC., Prodr. 2: 529. 1825.** Figs. 4e–f; 5

Tree, 3–22 m tall, DBH 45 cm; young branches hirsute, sometimes becoming glabrous, lenticellate. Leaves elliptic, 5–13 × 2.4–5.2 cm, coriaceous, discolorous, base cuneate, apex acute to acuminate, acumen 1–5 mm long, abaxially sericeous, adaxially glabrescent to sericeous, midrib plane, sericeous, primary veins 8–9 pairs, sericeous, occasionally with discoid glands abaxially at base or through all its length; petiole 5–7 mm long, terete, hirsute; stipules triangular, 2–5 mm long, persistent, eglandular. Inflorescence terminal to subterminal, racemose, hirsute; bracts 2, triangular, 4 mm long, caducous; bracteoles 2, triangular, 1 mm long, hirsute, persistent, with sessile glands. Flowers 1.1–1.5 cm long, pubescent, pedicel 0.7–1.2 cm long; receptacle campanulate, 2–3 mm long, glabrous except at throat; sepals triangular, 4–5 mm long, pubescent, reflexed, eglandular margin; petals rounded, 3–4 mm long, glabrous; stamens 6, inserted unilaterally, filaments 1.1 cm long; ovary 2 mm long, sericeous, style 0.8–2 cm long, hirsute at base. Drupe obovoid, 1.7–3.1 × 0.7–1.8 cm, epicarp sulcate, glabrous to sericeous, sepals and stamens persistent.

**Selected material:** Angra dos Reis, Pontal, 29.II.1998, fl., *A. Lobão* 282 (RB). Campos dos Goytacazes, Serra da Bela Joana, à margem do rio, 1.III.2014, fl., fr., *I.G. Costa* 386 (RB). Duque de Caxias, Reserva da Petrobrás, trilha ao redor da barragem, lado direito, interior de mata, 18.XI.1999, fl., *S.J. Silva Neto* 1345 (RB). Itatiaia, Parque Nacional do Itatiaia, lote 30, próximo ao rio, 3.XII.1940, fl., *W. Duarte de Barros* 127 (RB). Magé, In sylvaticis apricis pr. Mandiocca, fl., *L. Riedel* (NY378260). Mangaratiba, Ilha da Marambaia, topo da vertente noroeste, 18.II.2006, fl., *F.C. Nettesheim* 176 (RBR). Mendes, Fazenda São José das Paineiras, km 32 da RJ-127, 1.V.1993, fl., *T. Konno* 133 (RB). Miguel Pereira, Fazenda Rocha Negra, fl., fr., *G.M. Nunes* 299 (RB). Niterói, São Francisco, Parque Natural Municipal de Niterói (PARNIT), Morro Santo Inácio, 16.I.2017, fl., *D.N.S. Machado* 1171 (RB). Nova Friburgo, distrito de Lumiar/Macaé de Cima, Sítio Cabana Flor da

Montanha, 23.I.2001, fl., *A. Quinet* 50/65 (RB). Nova Iguaçu, Reserva Biológica do Tinguá, estrada do deserto, 18.XI.2002, fl., *W. da Silva* 13 (RB). Paraty, mata à margem do Rio Morredono, acesso pela Praia Negra, 22.III.1992, fl., *M.C. Marques* 287 (RB). Petrópolis, Carangola, XII.1949, fl., *O.C. Góes* 956 (RB). Rio de Janeiro, Bico do Papagaio, 20.II.1933, fl., *P. Rosa* 129 (RB). São José do Vale do Rio Preto, Sítio Serra do Capim, coletas organizadas pela Extracta Moléculas Naturais Ltda, Projeto de Bioprospecção, 13.I.2001, fl., *F.B. Pereira* 39/63 (RB, RFA). Sapucaia, 3º Distrito, Fazenda Selo Verde, 3.II.2001, fl., fr., *F.B. Pereira* 19/70 (RB). Silva Jardim, Reserva Biológica Poço das Antas, fragmento B, 26.V.1998, fl., fr., *S.V.A. Pessoa* 900 (RB).

*Hirtella hebeclada* occurs throughout the south and southeast region of Brazil (Asprino 2020). In the state of Rio de Janeiro, it occurs in Angra dos Reis, Campos dos Goytacazes, Duque de Caxias, Itatiaia, Magé, Mangaratiba, Mendes, Miguel Pereira, Niterói, Nova Friburgo, Nova Iguaçu, Paraty, Petrópolis, Rio de Janeiro, São José do Vale do Rio Preto, Sapucaia, and Silva Jardim (Fig. 5). The species is well represented in the states' collections, and is present in five conservation units.

*Hirtella hebeclada* is similar to *H. gracilipes* as mentioned before, but differs due to the larger leaves, the acumen length (1–5 mm long vs. 6–9 mm long), more pairs of primary veins (8–9 vs. 5–7), and triangular stipules. Collected with flowers from November to March and with fruits in February, March, and May.

**3.6. *Hirtella racemosa* Lam., Encycl. 3: 133. 1789.** Fig. 5

Small tree, young branches glabrous to sparsely tomentulose, becoming glabrous with age, lenticellate. Leaves oblong, 8.9–11 × 3.4–4.4 cm, chartaceous to coriaceous, discolorous, base subcordate, apex acuminate, acumen 1–1.1 cm long, glabrous on both sides, midrib plane adaxially, prominent abaxially, glabrous to sparsely tomentulose, primary veins 6–8 pairs, eglandular; petiole 3–4 mm long, tomentulose, terete, eglandular; stipules 2, ca. 6–7 mm long, linear, chartaceous, glabrous to sparsely tomentulose, persistent. Inflorescence terminal to subterminal, racemose, hirsute; bracts 2, linear, 4 mm long, pubescent to sparsely tomentulose; bracteoles 2, linear, 2 mm long, pubescent to sparsely tomentulose, bracts and bracteoles with sessile glands, rarely eglandular (Prance 1972). Flowers 1.3 cm long, puberulous to sparsely hirsute, pedicel 6 mm long; receptacle

campanulate, 2–3 mm long, glabrous except at throat (Prance 1972); sepals triangular to rounded, reflexed, 2–3 mm long, pubescent; petals rounded, 4–5 mm long; stamens 4, inserted unilaterally, filaments 0.9–1.1 cm long; ovary ca. 1 mm long, villous, style ca. 6 mm long, basal 2/3 tomentulose. Drupe ellipsoid, sessile, 1.2–1.3 × 0.6–0.7 cm, epicarp longitudinally striate, glabrous to sparsely pubescent.

**Selected material:** Rio de Janeiro, Botafogo, Morro de São João, VIII.1914, fl., *J.G. Kuhlmann* (RB136925).

**Additional material:** BRAZIL. BAHIA: Formosa do Rio Preto, estrada Formosa do Rio Preto para Mateiros, coletas efetuadas entre 23 a 70 km, 2.III.2015, fr., *A.M. Amorim et al.* 9199 (RB, CEPEC); 2.III.2015, fl., *A.M. Amorim et al.* 9198 (RB, CEPEC).

*Hirtella racemosa* occurs in Mexico, Central America, Bolivia, Brazil, Ecuador, French Guiana, Guyana, Suriname, and Venezuela. In Brazil it occurs in 23 states of the northern, northeastern, central-western, and southeastern regions, but not in the state of São Paulo (southeastern region) or the southern region (Asprino 2020). In the state of Rio de Janeiro, it occurs only in the municipality of Rio de Janeiro (Fig. 5). Although considered “Least Concern” (LC) when analyzed for Brazil (CNCFlora 2012b), this species has only a few and old records in the state, which represents a threat to its conservation.

This species has three varieties, *H. racemosa* var. *racemosa*, *H. racemosa* var. *hispida* Prance, *H. racemosa* var. *hexandra* (Willd. ex Roem. & Schult.) Prance, that can be distinguished by overlapping characters in the exsiccatea analyzed (Prance & Sothers 2003b). Therefore, no infraspecific taxa are accepted by us.

*Hirtella racemosa* is similar to *H. sprucei*, with which it shares the oblong leaves, of approximate dimensions (8.9–11 × 3.4–4.4 cm vs. 9.3–15.1 × 3.1–5.3 cm), glabrous on both sides, linear stipules, and the number of stamens (4 vs. 4–6). However, it can be recognized by the young glabrous to sparsely tomentulose branches, and bracts and bracteoles with glands. Collected with flowers in August.

### 3.7. *Hirtella sprucei* Benth. ex Hook.f., *Fl. bras.* 14(2): 31. 1867. Fig. 6

Small tree or shrub, 2–5 m tall; young branches sparsely hispid to hispid, becoming glabrous with age, sparsely lenticellate. Leaves oblong, 9.3–15.1 × 3.1–5.3 cm, chartaceous to coriaceous, discolorous, base cordate, apex

acuminate, acumen 0.9–1.5 cm long, glabrous on both sides, midrib prominent, glabrous, primary veins 7–9 pairs, glabrous, eglandular; petiole 2–3 mm long, glabrous, terete, eglandular; stipules 2, linear, 7 mm long, chartaceous, glabrous to sparsely hispid, persistent. Inflorescence terminal, racemose, pubescent; bracts 1, filiform to lanceolate, 3–5 mm long, sparsely hispid, eglandular; bracteoles 2, triangular, 1–2 mm long, glabrous, eglandular. Flowers 0.8–1.4 cm long, pubescent, pedicel 4–5 mm long; receptacle campanulate, 2 mm long, glabrous except at throat; sepals triangular to rounded, 3 mm long, pubescent on both sides, petals rounded, 3–4 mm long, glabrous; stamens 4–6, inserted unilaterally, filaments 0.8–1.1 cm long; ovary villous, style 1 cm long, basal 1/3 hirsute. Drupe ellipsoid, sessile, 2.1–2.4 × 0.8–0.9 cm, epicarp longitudinally striate, glabrous; sepals and stamens persistent.

**Selected material:** Cardoso Moreira, Sacramento, em mata do assentamento do Inca, 26.XI.2017, fl., *I.G. Costa* 933 (RB). Itaguai, Vila do Itaguahy, 23.X.1927, fl., *Pessoal do Horto Florestal* (RB136924). Mangaratiba, Ilha da Marambaia, III.1942, fl., *L.E. de Mello Filho* (NY378398, R35594). Rio de Janeiro, Serra do Mendanha, 27.XI.1969, fl., *D. Sucre* 6384 (RB).

**Additional material:** BRAZIL. BAHIA: Jacobina, fl., *J.S. Blanchet* 3568 (P, C). Rio de Contas, 7,9 km Marcolino Moura, e 2,3 km da Fazenda Teixeira, em direção de Rio de Contas, trilha do vale do Rio Baeta, 23.I.2005, fr., *R.M. Harley* 55432 (HUEFS).

*Hirtella sprucei* occurs in Bahia, Espírito Santo, Mato Grosso, Minas Gerais and Rio de Janeiro (Asprino 2020). In the state of Rio de Janeiro, it occurs in Cardoso Moreira, Itaguai, Mangaratiba, and Rio de Janeiro (Fig. 6). The small number of occurrences in the state, none of them in conservation units, may indicate a threat to the species’ populations or rarity.

*Hirtella sprucei* is similar to *H. racemosa*, as mentioned before. *Hirtella sprucei* can be characterized by the combination of sparsely hispid to hispid young branches, glabrous, elongate oblong leaves, inflorescence terminal and racemose, and pedicels 4–5 mm long. Collected with flowers in March, October, and November.

### 3.8. *Hirtella triandra* subsp. *punctulata* (Miq.) Prance, *Fl. Neotrop. Monogr.* 9: 306. 1972.

Basionym: *Hirtella punctulata* Miq., *Linnaea* 19: 439. 1846. Fig. 6

Tree or shrub, 3–8 m tall, DBH 12 cm; branches glabrous to tomentulose, lenticellate.



Leaves oblong-elliptic, 6–6.9 × 2.8–3.4 cm, membranous to chartaceous, discolorous, base acute, apex acute to acuminate, acumen 3.4–4.4 mm long, rarely mucronate, glabrous on both sides, midrib plane to slightly prominent, basal 1/3 pubescent, primary veins 7–8 pairs, with or without glands; petiole 2–4 mm long, tomentulose, terete, eglandular; stipules 2, linear, 3–5 mm long, chartaceous, glabrescent, caducous to subsistent. Inflorescence terminal, paniculate, pubescent to tomentulose; bracts 2, lanceolate, 3–5 mm long, pubescent, usually with 2 sessile glands; bracteoles 2, triangular, 2–3 mm long, pubescent, glands present or absent. Flowers 1–1.4 cm long, pubescent, pedicel ca. 4 cm long; receptacle campanulate, 2 mm long, pubescent; sepals rounded, 2 mm long, reflexed, puberulous; petals glabrous, 2–3 mm long; stamens 3–5, inserted unilaterally, filaments 0.9–1.2 cm long; ovary 1.5 mm long, sericeous, style 1–1.2 cm long, basal 1/2 glabrous to hirsute. Drupe obovoid, sessile, 1.3–1.6 × 0.7–0.8 cm, epicarp longitudinally striate, glabrous to pubescent, sepals and stamens persistent.

**Selected material:** Bom Jesus de Itabapoana, Fazenda São Jorge, próximo à Carabuçu, 22.XII.1982, fl., *M. Rosa* 74 (RB, RBR). Cabo Frio, Tamoios, Reserva Biológica do Mico Leão Dourado ao lado direito do clube dos associados do BANERJ, 28.IX.2003, fl., fr., *R.D. Ribeiro* 28 (RB). Campos dos Goytacazes, estr. Usina São João Lagoa do Campelo, 18.VIII.1981, fl., *D.S.D. Araújo* 4536 (NY, US, GUA). Itaguaí, 14.VII.1927, fl., *Pessoal do Horto Florestal 1007* (RB). Itaperuna, Córrego da Chica, à margem da estrada, 5.X.2014, fl., fr., *I.G. Costa* 569 (ALCB, CEPEC). Macaé, Faz. Jurubatiba, 17.IX.1986, fl., *D. Araújo* 7556 (RB). Niterói, Saco de São Francisco, 18.VII.1945, fl., *L. Tato* (RB53640). Quissamã, Fazenda São Miguel da Mata, área de tabuleiros, 31.X.2002, fl., *C. Farney* 4498 (RB). Rio de Janeiro, Grumari, Estrada da Guanabara nº 3115, início da trilha do pântano, 26.V.1992, fr., *R.C. Affonso* 3 (MBM, K). Saquarema, estrada para Praia Grande, 27.IX.1981, fl., fr., *A. Ducke* 11352 (RB). Silva Jardim, Reserva Biológica Poço das Antas, margem do Rio São João, entre a BR-101 e a ponte da linha férrea, 30.XI.1992, fl., fr., *M. Peron* 972 (RB). Teresópolis, Serra dos Órgãos, 1833, fl., fr., *M. Vauthier* 508 (P).

*Hirtella triandra* has a wide distribution in the American continent, from Mexico to Brazil (Prance & Sothers 2003b). On the other hand, *H. triandra* subsp. *punctulata*, has its distribution restricted to Brazil, occurring in the states of Bahia, Espírito Santo, Minas Gerais, and Rio de Janeiro (Asprino 2020). In the state of Rio de Janeiro, it occurs in Bom Jesus de Itabapoana, Cabo Frio,

Campos dos Goytacazes, Itaguaí, Itaperuna, Macaé, Niterói, Quissamã, Rio de Janeiro, Saquarema, Silva Jardim, and Teresópolis (Fig. 6).

*Hirtella triandra* subsp. *punctulata* differs from the other species due to the paniculate inflorescence, 1–1.4 cm long flowers, and ca. 4 cm long pedicel. In addition, the branches are glabrous to tomentulose, and the midrib is pubescent in the basal 1/3. Collected with flowers from July to December, and with fruits in January, May and from August to December.

#### 4. *Hymenopus* (Benth.) Sothers & Prance.

Genus based on the taxa previously accommodated in of *Licania* sect. *Hymenopus* and *L.* sect. *Hirsuta*, plus one species of *L.* sect. *Microdesmia* [i.e., *Hymenopus amapaensis* (Prance) Sothers & Prance] that have flowers with petals (Chave *et al.* 2020; Sothers *et al.* 2016). The genus has 28 species (Sothers *et al.* 2016).

*Hymenopus* is here first recorded for the state of Rio de Janeiro, represented by one species, *Hymenopus heteromorphus* var. *heteromorphus* (Benth.) Sothers & Prance.

##### 4.1. *Hymenopus heteromorphus* (Benth.) Sothers & Prance var. *heteromorphus*, Kew Bull. 71(58): 18. 2016.

Basionym: *Licania heteromorpha* Benth., in Hooker, J. Bot. 2: 221. 1840. Fig. 6

Tree, 8–13 m tall; young branches glabrous to tomentulose, becoming glabrous with age, lenticellate. Leaves elliptic, 7–12.5 × 3–5.2 cm, chartaceous, concolorous, base rounded to cuneate, with 2 glands, apex rounded to acute, glabrous on both sides, midrib impressed adaxially, sparsely tomentose at base, primary veins ca. 9 pairs; petiole 0.2–1 cm long, tomentose, terete; stipules 2, ca. 7 mm long, chartaceous, sericeous, caducous. Inflorescence axillary to terminal, racemose panicle, pubescent to tomentulose; bracts 1, triangular, ca. 1.1 mm long; bracteoles 1–3 mm long, triangular, glabrous adaxially, pubescent abaxially. Flowers ca. 5 mm long, sessile or pedicellate, pedicel up to 3 mm long; receptacle campanulate, ca. 3 mm long, puberulous on both sides; sepals 5, triangular, ca. 1 mm long, glabrous to setulose adaxially, pubescent abaxially; petals 5, 4–5.2 mm long, glabrous adaxially, pubescent abaxially; stamens 5–7, filaments 1–2.5 mm long, glabrous, free, included, inserted in a complete circle; ovary 0.1–0.5 mm long, inserted at receptacle base, pubescent; style 0.1–0.5 mm

long, glabrous. Drupe ellipsoid to globose, sessile, 1.1–2.8 × 0.9–1.9 cm, epicarp rough to rugose, granular, glabrous.

**Selected material:** Duque de Caxias, Cidade das Meninas, 26.VII.1943, fl., fr., *C. Carcerelli* 76 (RB). Magé, 3.VI.1985, fr., *R.R. Guedes* 941 (RB, K). Petrópolis, Carangola, XI.1943, fl., *O.C. Góes* 790 (RB). Rio de Janeiro, Quinta de São Cristóvão (cult.), 14.V.1882, fl., *A.F.M. Glaziou* 13671 (R, P).

*Hymenopus heteromorphus* was segregated from *Licania s.l.* (i.e., *L. heteromorpha* Benth.) based on molecular analyses and also supported by morphological characters such as the presence of petals and its leaf pubescence (Sothers *et al.* 2016). The species is predominantly distributed in the Amazon and includes four varieties, of which *H. heteromorphus* var. *heteromorphus* is the only one occurring in Southeastern Brazil.

*Hymenopus heteromorphus* var. *heteromorphus* occurs in Trinidad, Colombia, Peru, Venezuela, the Guianas, Bolivia, and Brazil (Prance 1972; Prance & Sothers 2003a; Sothers *et al.* 2016). In Brazil it occurs in the states of Acre, Amazonas, Amapá, Espírito Santo, Maranhão, Mato Grosso, Pará, Rio de Janeiro, Rondônia, and Roraima (Sothers & Prance 2020c). In the state of Rio de Janeiro, it occurs in Duque de Caxias, Magé, Petrópolis, and Rio de Janeiro (Fig. 6). Although widely distributed, there are few records for the taxon in the state of Rio de Janeiro and among them only one (*O.C. Góes* 790) is inside a conservation unit (APA da Região Serrana de Petrópolis).

*Hymenopus heteromorphus* var. *heteromorphus* is distinguished from other species from Rio de Janeiro previously included in *Licania s.l.* by the presence of petals and included and inserted in a complete circle stamens. It is characterized by its glabrous leaves, with two glands at the base, the rounded apex, and sessile fruit with a rough to rugose and glabrous epicarp. Collected with flowers in May, July, November, and December and with fruits in June, July, September, and December.

### 5. *Leptobalanus* (Benth.) Sothers & Prance.

Genus based on the taxa previously accommodated in *Licania* sect. *Leptobalanus* and includes 31 species (Sothers *et al.* 2016). *Leptobalanus* differs morphologically from the other eight genera previously in *Licania s.l.* by the far exserted stamens (differing from *Licania* and *Hymenopus*), inserted in a complete circle (usually unilateral in *Licania*), and by the absence of petals

(vs. petals present in all the others except *Licania*) (Sothers *et al.* 2016).

In the state of Rio de Janeiro the genus is represented by one taxon, *L. octandrus* subsp. *octandrus* (Hoffmanns. ex Roem. & Schult.) Sothers & Prance. Although previously reported for the state (Sothers & Prance 2020d), the *Leptobalanus humilis* (Cham. & Schtdl.) Sothers & Prance material does not correspond to the species, but to *Licania* species instead.

#### 5.1. *Leptobalanus octandrus* (Hoffmanns. ex Roem. & Schult.) Sothers & Prance subsp. *octandrus*, Kew Bull. 71(58): 27. 2016.

Basionym: *Hirtella octandra* Hoffmanns. ex Roem. & Schult., Syst. Veg. 15(5): 274. 1819.

Figs. 4g-j; 6

Tree, 5–35 m tall, DBH 5–9.5 cm; young branches strigose to sparsely strigose, becoming glabrous with age, lenticellate. Leaves elliptic, 3.5–11.9 × 1.5–5.3 cm, chartaceous to coriaceous, discolorous, base acute, rounded to cuneate, apex acuminate, acumen 2–4 mm long, glabrous to tomentose on both sides, abaxially with stomatal cavities, midrib impressed, adaxially glabrous, primary veins 5–8 pairs; petiole 3–9 mm long, glabrous to puberulous, plane adaxially, usually with 2 glands; stipules 2, filiform, 2–6 mm long, chartaceous, sparsely sericeous, sometimes caducous. Inflorescence terminal, racemose panicle, puberulous; bracts 1, triangular, 1–3 mm long, strigose; bracteoles 3, triangular, 0.8–1.2 mm long, strigose. Flowers 2–5 mm long, pubescent to strigose, sessile or pedicellate, pedicel ca. 1 mm long; receptacle campanulate, ca. 2 mm long, villous; petals absent; sepals 5, triangular, 1–1.5 mm long, sericeous on both sides; stamens 7, 2–3 mm long, inserted in a complete circle, filaments glabrous, free, exserted; ovary 0.5–0.7 mm long, inserted at the receptacle base, sericeous; style 2–5 mm long, sparsely sericeous. Drupe ellipsoid to widely ellipsoid, stipitate or not, 1.8–4.2 × 1.5–3.9 cm, epicarp smooth to slightly rugose, glabrous to puberulous.

**Selected material:** Angra dos Reis, Saco de Piraquara de Fora, remanescente de Mata Atlântica de encosta, 9.IX.1999, *A. Oliveira* (RB346193). Guapimirim, Estação Ecológica Estadual de Paraíso, parcela 11, Cumieira do Morro das Pacas, 20.II.1992, *H.C. Lima* (RB314302). Mangaratiba, Ilha da Marambaia, cota 500 m, parcela 39, planta 11, Vertente Baía de Sepetiba, seguindo à direita do Totem, área bem devastada, 22.III.2008, *G.A. Rodrigues II* (RBR). Niterói, Parque Estadual da Serra da Tiririca, trilha da Cumeeira,

indivíduo 51 do transect TB4, 18.III.2006, *A.A.M. de Barros 2922* (RB). Nova Iguaçu, Reserva Biológica do Tinguá, 26.V.1993, *M.M.T. Rosa* (RBR22261). Paraty, picada para o Pico do Cairuçu, 21.III.1992, fl., fr., *C. Farney 3068* (RB). Pirai, represa de Ribeirão das Lages, remanescente de mata secundária, 13.VI.1989, *I.M. Silva* (RBR5721). Rio de Janeiro, Alto da Boa Vista, topo da REVIC, 18.III.1997, fl., *C.A.L. Oliveira 1281* (K). Silva Jardim, fragmento B, 24.VI.1998, fl., *S.V.A. Pessoa 905* (RB).

*Leptobalanus octandrus* was segregated from *Licania* s.l. [*i.e.*, *Licania octandra* (Hoffmanns. ex Roem. & Schult.) Kuntze], as a result of molecular analyses and also supported by morphological characters, such as the exerted stamens inserted in a complete circle, and the absence of petals. This species is predominantly distributed in the Amazon forest, with three recognized subspecies, of which only *L. octandrus* subsp. *octandrus* occurs in the state of Rio de Janeiro.

*Leptobalanus octandrus* subsp. *octandrus* occurs in Bolivia, Brazil, Colombia, the Guianas, Peru, and Venezuela (Prance & Sothers 2003; Sothers *et al.* 2016). In Brazil it occurs in the states of Amazonas, Amapá, Bahia, Ceará, Maranhão, Pará, Paraíba, Pernambuco, Roraima, Sergipe, Tocantins, and in all the central-western and southeastern states (Sothers & Prance 2020d; Prance & Sothers 2003). In the state of Rio de Janeiro, it occurs in Angra dos Reis, Guapimirim, Nova Iguaçu, Paraty, Pirai, Rio de Janeiro, and Silva Jardim (Fig. 6).

It is distinguished from other species of Chrysobalanaceae in Rio de Janeiro by the absence of petals, the filiform stipules, and exerted stamens inserted in a complete circle. The stomatal cavities present in the abaxial side of the leaves is an easily recognizable feature. However, it is shared with other species of the family. Collected with flowers in February, March, May, June, and July and with fruits in March, June, July, September, and November.

Popular name: Simbiíba (*C. Farney 3068*, 3088).

## 6. *Licania* Aubl.

Trees or shrubs. Leaves pubescent to glabrous, stomatal cavities present or absent; petiole with or without a pair of glands. Inflorescence racemose panicles, panicles or spikes; bracteoles smaller or rarely the same as calyx length, not covering floral buds. Flower usually with cupuliform, urceolate, or campanulate receptacle, pubescent; sepals 5; apetalous; stamens 2–7(–8–11), unilaterally

inserted, rarely in a complete circle, equaling the calyx or included, filaments usually free at base, glabrous, rarely sparsely pubescent; ovary pubescent, inserted at the receptacle base. Drupe globose to ellipsoid, epicarp pubescent to glabrous; endocarp glabrous or pubescent (Prance 2003; Sothers *et al.* 2016).

The genus comprises ca. 100 species, distributed in the Neotropics (Sothers *et al.* 2016). In the state of Rio de Janeiro it is represented by 11 species.

### 6.1. *Licania arianeae* Prance, Fl. Neotrop. Monogr. 9S: 44. 1989. Figs. 4k-l; 7; 8

Tree or shrub, to 26 m tall, DBH 20 cm, young branches pubescent, sometimes becoming glabrous with age, lenticellate. Leaves elliptic, 9.8–17.2 × 4.4–7.3 cm, chartaceous, discolorous, base cuneate, apex acuminate, acumen 1–1.1 cm long, glabrous adaxially, pubescent abaxially and with stomatal cavities, midrib impressed adaxially, glabrous, primary veins 8–9 pairs; petiole 4–8 mm long, pubescent to glabrous, terete, with 2 sessile glands at apex; stipules 2, persistent, 5–6 mm long, rectangular to lanceolate, pubescent. Inflorescence terminal, panicle of cymes, tomentulose; bracts 1, lanceolate 3–5 mm long, tomentulose, caducous; bracteoles 3, triangular, ca. 0.5 mm long, pubescent. Flowers 5–5.5 mm long, puberulous, receptacle campanulate, 3–3.5 mm long, tomentulose on the inside, pedicel 1–1.5 mm long; sepals 5, ca. 2.5 mm long, puberulous on both sides; stamens 8, inserted unilaterally, free; filaments ca. 1.5 mm long, glabrous, pubescent at base; ovary 1–1.5 mm long, villous, style 4 mm long, pubescent at middle. Drupe ellipsoid, sessile, ca. 4 × 4.5 mm, epicarp rugose, pubescent.

**Selected material:** Armação dos Búzios, Praia da Gorda, 14.XII.2003, fl., fr., *H.G. Dantas 74* (RB). Arraial do Cabo, Área de Proteção Ambiental de Massambaba, 22°55'00"S, 42°14'00"W, 2.IV.2011, fr., *A.C.S. Andrade AC065* (RB). Cardoso Moreira, localidade de Paraíso, em vegetação à margem da estrada, 18.VII.2015, fr., *I.G. Costa 695* (RB). São Francisco de Itabapoana, próximo a entrada da parcela P4, grade PPBio Mata Atlântica, Estação Ecológica Estadual Guaxindiba, 9.VII.2018, fl., fr., *H.C. de Lima 8679* (RB). Saquarema, Reserva Ecológica Estadual de Jacarepiá, na extremidade oeste da Reserva, próximo a lixeira, na orla da mata, 29.XI.1993, fl., *D. Araújo 9948* (RB). Rio das Ostras, Reserva Biológica União, 14.VIII.1998, fl., *P.P. Oliveira 351A* (MBM).

*Licania arianeae* was originally endemic to the state of Espírito Santo, but is here first recorded



**Figure 7** – a-b. *Licania arianeae* – a. inflorescence; b. fruit. Photos: a, b. H.C de Lima.

for the state of Rio de Janeiro, in the municipalities of Armação de Búzios, Arraial do Cabo, Cardoso Moreira, São Francisco de Itabapoana, Saquarema, and Rio das Ostras (Fig. 8). The fruits were not observed by Prance (1989) or Prance & Sothers (2003a), are described here for the first time. Most of the species occurrence in the state of Rio de Janeiro is inside conservation units (Área de Proteção Ambiental de Massambaba, Estação Ecológica do Paraíso, Estação Ecológica Estadual de Guaxindiba, and Reserva Biológica União) and it's distribution is related to sand dunes and *tabuleiro* forests. This species is classified as “Endangered” (EN) to Brazil (Amorim *et al.* 2013).

*Licania arianeae* is easily recognized by the stomatal cavities on the abaxial side of the leaves and persistent stipules, characters also present in *L. riedelii*. However, it is distinguished by the size of the stipules (5–6 mm long), campanulate receptacle, and unilateral stamens aggregated at the base by pubescence. Collected with flowers and fruits in August.

**6.2. *Licania belemii*** Prance, Fl. Neotrop. Monogr. 9: 172. 1972. Figs. 8; 9

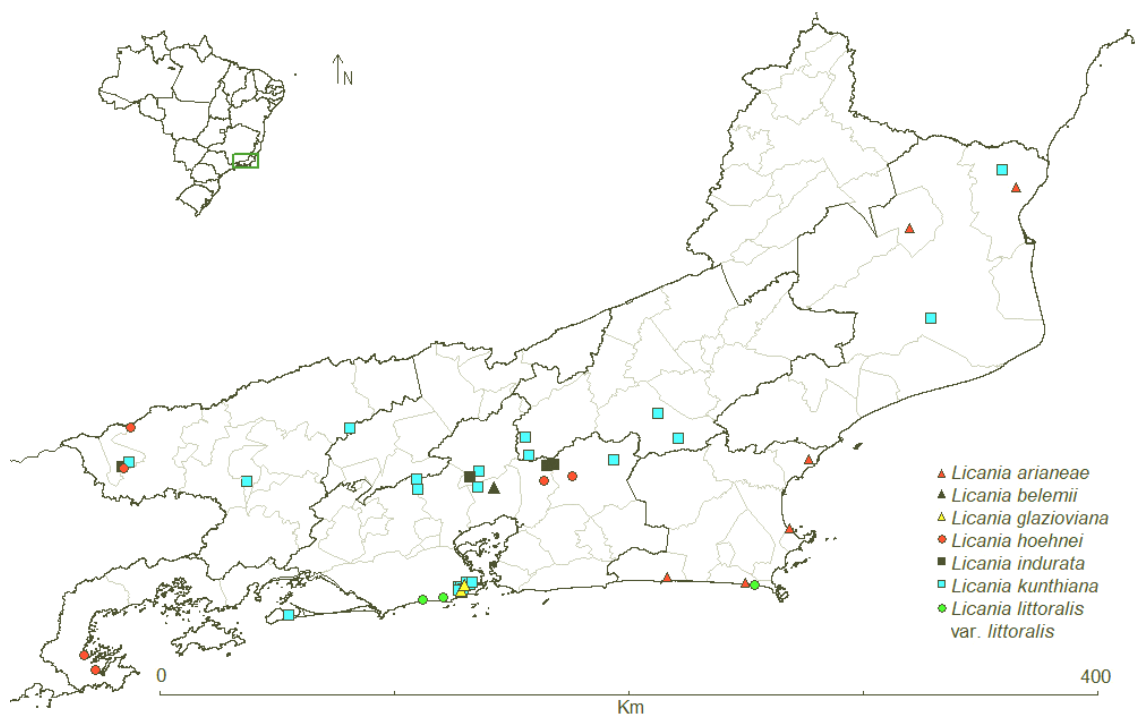
Tree, to 30 m tall, DBH 77 cm, branches sparsely puberulous, lenticellate. Leaves elliptic, 9.5–12 × 3.6–4.5 cm, chartaceous, discoloured, base cuneate, apex acuminate, acumen 1–2 cm long, adaxially glabrous, abaxially tomentose,

stomatal cavities absent, midrib plane adaxially, prominent abaxially, primary veins ca. 6 pairs; petiole 0.7–1 cm long, puberulous, terete to slightly canaliculate, eglandular; stipules caducous (not observed). Inflorescence terminal, racemose panicle, tomentose; bracts not observed; bracteoles 3, triangular, ca. 0.5 mm long, persistent, glabrous adaxially and tomentose abaxially. Flowers 1–1.5 mm long, sessile, puberulous on the outside; receptacle campanulate, ca. 1 mm long, tomentose on the inside; sepals 5, ca. 1–2 mm long, triangular, puberulous on both sides; stamens 6, 0.5–0.8 mm long, inserted in a semi-circle, free, included, filaments glabrous; ovary ca. 1 mm long, tomentose, style 1.5 mm long, basal 3/4 tomentose. Immature drupe piriform, ca. 2.2 × 1.6 cm, epicarp rugose.

**Selected material:** Magé, distrito de Piabetá, estrada do Matão, 22°34'08”S, 43°07'18”W, 16.I.2001, fl., A. Quinet 58/64 (RB).

**Additional material:** BRAZIL. BAHIA: Una, km 17 da estrada que liga a rod. BR-101 (São José) à rod. BA-215, Região de Mata Higrófila Sul Baiana, folha SE-24(15-39c), 29.X.1978, fr., S.A. Mori (RB206086).

*Licania belemii* is known from the states of Bahia and Espírito Santo, and is recorded here for the first time for the state of Rio de Janeiro, based on one collection from Magé, collected inside the Parque Nacional da Serra dos Órgãos (Fig. 8). The species is classified as “Endangered” (EN) in Brazil (Amorim *et al.* 2013).



**Figure 8** – *Licania arianeae*, *L. belemii*, *L. glazioviana*, *L. hoehnei*, *L. indurata*, *L. kunthiana* and *L. littoralis* var. *littoralis* distribution map in the state of Rio de Janeiro.

*Licania belemii* can be distinguished by the combination of sparsely puberulous branches, leaves adaxially glabrous and abaxially tomentose, and stamens inserted in a semi-circle. Collected with flowers in January.

**6.3. *Licania glazioviana*** Warm., Vidensk. Meddel. Dansk Natuhist. Foren. Kjøbenhavn: 68. 1874.

Fig. 8

Tree, up to 9 m tall; branches glabrous, lenticellate. Leaves elliptic, 3.7–7.2 × 1.2–3.2 cm, membranous, concolorous, base acute to cuneate, apex acuminate, acumen 7–7.9 mm long, glabrous on both sides, stomatal cavities absent, midrib plane adaxially, glabrous, primary veins 6–7 pairs; petiole 2–5 mm long, glabrous, canaliculate, eglandular; stipules 2, lanceolate, 1–5 mm long, glabrous, caducous. Inflorescence terminal to subterminal, panicle, glabrous to puberulous; bracts 1, filiform, 2–4 mm long, puberulous; bracteoles 2, triangular, ca. 1 mm long, puberulous. Flowers ca. 3–4 mm long, sessile, puberulous; receptacle urceolate, 2–3 mm long, tomentose on the inside (Prance 1972), sepals 5, ca. 1 mm long, triangular, reflexed, puberulous on both sides; stamens 5, inserted unilaterally, connate at base, filaments pubescent (Prance 1972); ovary

villous; style the same length as the filaments, pubescent (Prance 1972). Immature drupe ellipsoid, sessile, 1–1.8 × 0.5–1.2 cm, epicarp rough to rugose, glabrous.

**Selected material:** Rio de Janeiro, Tijuca, 2.IV.1868, fl., A.F.M. Glaziou 2561 (P, K).

*Licania glazioviana* is endemic to Rio de Janeiro Municipality (Fig. 8), occurring in Parque Nacional da Tijuca, and is considered Data Deficient (DD) (Fernandez *et al.* 2018).

*Licania glazioviana* is characterized by its membranous leaves and stipules, and glabrous leaves. Collected with flowers in January, April, and August and with fruits from June to September and in December.

**6.4. *Licania hoehnei*** Pilg., Notizbl. Bot. Gart. Berlin-Dahlem, 8: 541. 1923. Fig. 8

Tree, 9–17 m tall, DBH 51.5–68 cm; young branches strigose, becoming glabrous with age, lenticellate. Leaves elliptic, 3.9–8.8 × 1.7–3.6 cm, coriaceous, discolorous, base cuneate, apex acute to acuminate, acumen 5–1.2 cm long, adaxially glabrous, abaxially puberulous, stomatal cavities absent, midrib plane or impressed in the basal 3/4, primary veins 6–9 pairs; petiole 0.4–1.1 cm long,



Figure 9 – *Licania belemii* (A. Quinet 58/64, RB).

glabrous to strigose, canaliculate, eglandular; stipules 2, caducous, triangular, 1–2 mm long, strigose, chartaceous. Inflorescence terminal to axillary, racemose panicle, tomentose; bracts 1, triangular, ca. 1 mm long, sericeous; bracteoles 1, triangular, ca. 0.5 mm long, abaxially tomentulose, adaxially glabrous. Flowers ca. 3 mm long, sessile, tomentulose; receptacle campanulate, ca. 2 mm long, sericeous on both sides; sepals 5, ca. 1 mm long, triangular, sericeous on both sides; stamens 5–7, 0.5 mm long, inserted in a complete circle, free, included, filaments glabrous; ovary 1–2 mm, sericeous; style ca. 2 mm long, sericeous. Drupe ellipsoid, stipitate, 1.6–5.1 × 1.7–3.6 cm, epicarp slightly rugose to smooth, puberulous to glabrous. **Selected material:** Cachoeiras de Macacu, 6° Distrito, Fazendas consorciadas - Fazenda Sertão, 2.X.2000, fr., *F.B. Pereira* 09/38 (RB, NIT). Guapimirim, Estação Ecológica Estadual do Paraíso, próximo ao Centro de Primatologia, 22.X.2010, fr., *O. Thier OT 2172* (RB). Itatiaia, Benfica, 11.IX.1918, fl., fr., *P. Campos Porto 729* (RB, NIT). Paraty, Área de Proteção Ambiental de Cairuçu, 100 m.s.m., 10.X.1990, fl., *G. Martinelli 14401* (RB); Resende, Bosque do Visconde, trilha da família,

Parque Estadual da Pedra Selada, 19.IV.2018, fr., *C. Baez 1637* (RB).

*Licania hoehnei* occurs in Bolivia and Brazil. In Brazil, it occurs in the states of Bahia, Espírito Santo, Mato Grosso, Minas Gerais, Rio de Janeiro, and São Paulo (Sothers *et al.* 2016; Sothers & Prance 2020e). In the state of Rio de Janeiro it occurs in Cachoeiras de Macacu, Guapimirim, Itatiaia, Paraty, and Resende (Fig. 8). It was collected in Estação Ecológica Estadual do Paraíso, Parque Nacional do Itatiaia, and Área de Proteção Ambiental de Cairuçu, which may suggest a minor conservation concern.

*Licania hoehnei* is difficult to identify because it shares characters with *L. indurata*, *L. kunthiana*, and *L. spicata*. With the first, *L. hoehnei* shares the glabrous mature branches, the absence of stomatal cavities, the leaf-blades with acuminate apex, and stipitate fruit. *Licania hoehnei* shares with *L. kunthiana* the petiole and length of the leaves, the acuminate apex, triangular stipules, the absence of stomatal cavities, campanulate receptacle, stamens inserted in a complete circle, and the stipitate fruit. It also shares with *L. spicata* the glabrous mature branches, the absence of stomatal cavities, acuminate apex, sessile flower, stamens inserted in a complete circle, and the stipitate fruit. However, *L. hoehnei* is distinguished by the tomentose inflorescence, sessile flower, and only one bracteole at the flower base, while the other species mentioned have three. Collected with flowers from September to October and with fruits in April, September, and October.

**6.5. *Licania indurata*** Pilg., Notizbl. Bot. Gart. Berlin-Dahlem 8: 542. 1923. Fig. 8

Tree, up to 25 m tall; young branches sparsely puberulous, becoming glabrous with age, lenticellate. Leaves elliptic, 3.6–6.7 × 1.2–2 cm, chartaceous to coriaceous, discolorous, base acute to cuneate, apex acute to acuminate, acumen 6–10 mm long, glabrous on both sides, stomatal cavities absent, midrib plane adaxially, prominent abaxially, glabrous, primary veins 4–6 pairs; petiole 3–5 mm long, glabrous, canaliculate, eglandular; stipules caducous (not observed). Inflorescence terminal, racemose panicle, puberulous; bracts caducous; bracteoles 3, triangular, ca. 1 mm long, puberulous. Flowers 2 mm long, sessile to pedicellate, pedicel ca. 0.5 mm long, puberulous; receptacle campanulate, ca. 1 mm long, velutinous on the inside, puberulous on the outside; sepals 5, triangular, ca. 1 mm long, puberulous on both sides; stamens 4–5, 1 mm

long, inserted unilaterally, free, included, filaments glabrous; ovary ca. 0.9 mm long, sericeous; style ca. 1.5 mm long, sparsely sericeous. Drupe ellipsoid to widely ellipsoid, stipitate, 1–2.2 × 0.5–1.5 cm, epicarp rugose, puberulous, mesocarp fibrous, endocarp lanuginose.

**Selected material:** Guapimirim, Estação Ecológica Estadual de Paraíso, caminho próximo à represa da CEDAE, 27.X.1984, fr., *H.C. Lima 2275* (RB, MBM, NY, K). Itatiaia, 1918, *P. Campos Porto 730* (RB). Petrópolis, Quitandinha, 1948, fr., *O.C. Góis* (RB62418).

**Additional material:** BRAZIL. SÃO PAULO: Alto da Serra, fl., *E. Schwebel 81* (R, SPF, NY).

*Licania indurata* has been previously considered endemic to the state of São Paulo (Prance 1972). However, there are confirmed records for the state of Rio de Janeiro (Prance & Sothers 2003; Sothers & Prance 2020e; Sothers *et al.* 2016). The identification of the specimen collected by *L. Damasio* (RB47980) also confirms its occurrence in the state of Minas Gerais. However, we cannot confirm the occurrence for Mato Grosso, cited in Amorim *et al.* (2013). The only specimen from Mato Grosso available at the speciesLink platform (*C.C. Berg P 19928*, INPA) does not correspond to Chrysobalanaceae. Therefore, the species is distributed in the states of Minas Gerais, Rio de Janeiro, and São Paulo. In the state of Rio de Janeiro, it is found in Itatiaia, Guapimirim, and Petrópolis (Fig. 8). The species is classified as “Endangered” (EN) for Brazil (Amorim *et al.* 2013), and this classification also applies to the state of Rio de Janeiro, considering the same threats and the fact that it was found in only one conservation unit, the Estação Ecológica Estadual de Paraíso.

*Licania indurata* is similar to *L. hoehnei*, as aforementioned. The species is also similar to *L. kunthiana*, which shares the glabrous mature branches, glabrous, chartaceous to coriaceous leaves, acuminate apex, without stomatal cavities, puberulous inflorescence, campanulate receptacle, and stipitate fruit. *Licania indurata* also has characteristics in common with *L. spicata*, such as the caducous stipules, glabrous leaves, with acute to acuminate apex, without stomatal cavities, puberulous inflorescence, and stipitate fruit. However, *L. indurata* is distinguished by the 3–5 mm long petiole, leaves with 4–6 primary veins pairs, campanulate receptacle, and stamens unilaterally inserted. Collected with fruits in October.

Popular name: Milho-torrado (*P. Campos Porto 730*).

**6.6. *Licania kunthiana*** Hook.f., *Fl. bras.* 14(2): 16. 1867. Fig. 8

Tree, 5–25 m tall, DBH 11–37 cm; young branches puberulous to strigose, becoming glabrous with age, lenticellate. Leaves elliptic, 3–8.8 × 1.5–3 cm, chartaceous to coriaceous, discolorous, base acute to cuneate, apex acuminate, acumen 0.5–1.2 cm long, glabrous on both sides, stomatal cavities absent, midrib plane adaxially, primary veins 5–9 pairs; petiole 0.2–1.5 cm long, glabrous to sericeous, slightly canaliculate, eglandular; stipules 2, caducous, triangular, 1–2.5 mm long, sericeous, chartaceous. Inflorescence terminal to subterminal, racemose panicle, puberulous, bracts 1, filiform to lanceolate, 0.5–1 mm long, puberulous to sericeous; bracteoles 3, triangular, ca. 1 mm long, pubescent. Flowers 2–4 mm long, pedicel 0.9–1 mm long, pubescent; receptacle campanulate, 1–3 mm long, pubescent on both sides; sepals 5, triangular, 5–8 mm long, glabrous to pubescent adaxially, pubescent abaxially; stamens 3–4(–7), 1–2.5 mm long, inserted in a complete circle, free, included, filaments glabrous; ovary ca. 3 mm, puberulous; style 0.8–1.2 mm long, pubescent to tomentose. Drupe globose to slightly oblate, stipitate, 1.2–4 × 1.1–3.9 cm, epicarp smooth to slightly rugose, glabrous to puberulous, mesocarp fibrous, endocarp hirsute.

**Selected material:** Cachoieras de Macacu, Fazendas consolidadas Sertão, 83 m, 7.X.2000, fr., *F.M.B. Pereira 20/039* (RB). Campos dos Goytacazes, Imbé, 11.VII.1997, *M.R. Moreno 182* (HUENF). Itatiaia, 1918, fr., *P. Campos Porto* (RB15497). Mangaratiba, Ilha da Marambaia, cota 500 m, parcela 36, planta 06, vertente da Baía de Sepetiba, seguindo à direita do Totem, na bacia hidrográfica, 21.III.2008, *G.A. Rodrigues 16* (RBR). Miguel Pereira, Reserva Biológica do Tinguá, orbel II, Módulo PPBio Mata Atlântica, área da parcela 5D, 19.VIII.2015, fr., *F.F. Negreiros 51* (RB). Nova Friburgo, Reserva Ecológica Municipal de Macaé de Cima, picada para Pedra Bicuda, 25.VI.1989, fr., *C.M.B. Correia 33* (RB, NY). Nova Iguaçu, Reserva Biológica do Tinguá, Estrada do Ouro, linha 3, 11.VI.1994, *H.C. Rodrigues* (RBR26010). Petrópolis, fl., *A.F.M. Glaziou* (R63225). Rio de Janeiro, Mata do Pai Ricardo, perto da sede do Horto Florestal, 10.VIII.1927, fl., *Pessoal do Horto Florestal* (RB136932). São Francisco de Itabapoana, Fazenda Santana, 28.X.2008, *K.M.P.A. Archanjo 2713* (HUENF). Teresópolis, Posse, 8.VII.2000, fr., *C. Prado 155* (RBR). Valença, distrito de Barão de Juparanã, Faz. sta. Mônica, 15.VIII.2000, *M.L.C.V. Spolidoro 235* (RB). Volta Redonda, Floresta da Cicuta, Vale do Paraíba do Sul, 11.XI.2001, fr., *G.R. Souza. 338* (RB).

*Licania kunthiana* occurs in Bolivia, Brazil, Costa Rica, French Guiana, Peru, and Venezuela

(Prance & Sothers 2003). In Brazil, it occurs in all states of the northern, central-western, southeastern regions and in some states of the northeastern region (Bahia, Maranhão, Pernambuco, and Sergipe) (Sothers & Prance 2020e). In the state of Rio de Janeiro, it is found in Cachoeiras de Macacu, Campos dos Goytacazes, Itatiaia, Mangaratiba, Nova Friburgo, Nova Iguaçu, Valença, Rio de Janeiro, and Teresópolis (Fig. 8). It was collected in four conservation units (Estação Ecológica Estadual de Paraíso, Parque Nacional da Tijuca, Reserva Biológica do Tinguá, and Reserva Ecológica Municipal de Macaé de Cima) and is one of the most frequently collected species of Chrysobalanaceae in the state.

*Licania kunthiana* is similar to *L. hoehnei* and *L. indurata*, as above-mentioned. It differs from *L. hoehnei* due to the glabrous leaves, puberulous inflorescence and pedicellate flower. It differs from *L. indurata* by the larger number of primary vein pairs (5–9 pairs), longer petiole (0.2–1.5 cm long), flowers with longer pedicels (0.9–1 mm long), and stamens inserted in a complete circle. Collected with flowers in August, and with fruits in July, October and November.

**6.7. *Licania littoralis* Warm. var. *littoralis*,** Vidensk. Meddel. Dansk Natuhist. Foren. Kjøbenhavn: 67. 1874. Fig. 8

Tree or shrub, 1–11 m tall; branches glabrous, lenticellate. Leaves elliptic, 5–10 × 2.7–7.1 cm, chartaceous to coriaceous, concolorous, base rounded to cordate, apex retuse to acute, glabrous on both sides, stomatal cavities absent, midrib plane adaxially, prominent abaxially, primary veins ca. 5 pairs; petiole 2–3 mm long, glabrous, terete, eglandular; stipules 2, persistent, lanceolate, 1–3 mm long, glabrous. Inflorescence terminal, racemose panicle, pubescent; bracts 1, lanceolate, ca. 2 mm long; bracteoles 3, triangular, 0.5–1 mm long, persistent. Flowers ca. 3 mm long, sessile, puberulous; receptacle campanulate, ca. 2 mm long, tomentulose on the inside; sepals 5, triangular, ca. 1 mm long, puberulous on both sides; stamens 5–6, 0.4–0.8 mm long, inserted in a semi-circle, free, included, filaments glabrous; ovary ca. 1 mm, tomentulose; style ca. 1.5 mm long, sparsely pubescent. Drupe ellipsoid, stipitate, 2 × 1.7 cm, epicarp slightly rugose, pubescent.

**Selected material:** Arraial do Cabo, conglomerado 358-1-5-39, UTM do Ponto Central: E (0193988m), N (7453920m), fuso do GPS (24k), 22.IX.2015, fr., *T.D. Gaii 341* (RB). Rio de Janeiro, Guanabara, km 5, estrada

BR-6, 20.VIII.1965, fl., fr., *W. Hoehne 6047* (RB, NY, CEPEC, HUEM, SPF, HUEFS, ALCB, HUFU, ESA, US).

*Licania littoralis* var. *littoralis* occurs in the states of Rio de Janeiro, Espírito Santo, Bahia, Pernambuco, Sergipe, and Paraíba (Sothers & Prance 2020e; Sothers *et al.* 2016). In the state of Rio de Janeiro, it is found only in the municipalities of Rio de Janeiro, and Arraial do Cabo (Fig. 8). Two specimens were collected in western Rio de Janeiro, a region with intense real estate expansion, which may threaten this taxon's conservation.

*Licania littoralis* var. *littoralis* can be distinguished by the combination of the glabrous young branches, short petiole (2–3 mm long), leaves with retuse to acute apex, and few primary veins pairs (ca. 5 pairs). Collected with flowers from July to August, and with fruits in August and December.

**6.8. *Licania micrantha* Miq. subsp. *micrantha*.** Stirp. Surinam. Select.: 29. 1851. Fig. 10

Tree, up to 7 m tall; branches glabrous, lenticellate. Leaves elliptic, 6–8.2 × 3.2–4.8 cm, chartaceous, discolorous, base cuneate, apex acuminate, acumen 3–7 mm long, adaxially glabrous, abaxially tomentose, stomatal cavities absent, midrib impressed adaxially, primary veins 4–5 pairs; petiole 4–5 mm long, glabrous, terete, eglandular; stipules 2, lanceolate, 5–6 mm long, sparsely puberulous, persistent. Inflorescence terminal to subterminal, racemose panicle, pubescent; bracts 1.5 mm long, triangular, persistent; bracteoles 3, triangular, 1–1.5 mm long, pubescent, persistent. Flowers 3–3.5 mm long, sessile, puberulous; receptacle campanulate, ca. 2.5 mm long, tomentulose on the inside; sepals 5, 1 mm long, triangular, puberulous on both sides; stamens 2–3, ca. 0.5 mm long, inserted unilaterally or in a semi-circle, free, included, filaments glabrous; ovary 0.8–1 mm long, pubescent; style 2.5–3 mm long, pubescent throughout. Drupe ellipsoid, stipitate, 2–2.5 × 1.7–1.9 cm; epicarp rugose, puberulous; mesocarp fibrous; endocarp tomentose. **Selected material:** Cabo Frio, segundo distrito (Tamoios), 16.XII.2003, fr., *D. Fernandes 770* (RB). **Additional material:** BRAZIL. ESPÍRITO SANTO: Itapemirim, próximo à área protegida pela Marinha, estrada de Itaóca-Itapemirim, rodovia ES-060, 20°57'1"S, 40°48'38"W, 19.X.2008, fl., *A.C.S. Cavalcanti 277* (RB).

*Licania micrantha* subsp. *micrantha* occurs in Costa Rica, the Guianas, Venezuela, Colombia, Peru, Bolivia, and Brazil (Sothers *et al.* 2016). In Brazil, it is recorded for the states of Acre,



Amazonas, Amapá, Pará, Rondônia, Roraima, Bahia, Mato Grosso, Espírito Santo, and Rio de Janeiro (Sothers & Prance 2020e). In the state of Rio de Janeiro it is found only in Cabo Frio (Fig. 10), inside the limits of Parque Ecológico do Mico Leão Dourado.

Can be distinguished from the other species of the genus by the abaxially tomentose leaves, the smaller number of stamens [2–3 vs. more than 4 in other species and 3–4(–7) in *L. kunthiana*], and the receptacle length (ca. 2.5 mm vs. to 2 in other species, except *L. arianae* with 3–5.5 mm and *L. kunthiana* with 1–3 mm). Collected with fruits in November and December.

Popular name: Cindibareia (*G.S.Z Rezende 265*).

**6.9. *Licania nitida*** Hook.f., *Fl. bras.* 14(2): 17. 1867. Fig. 10

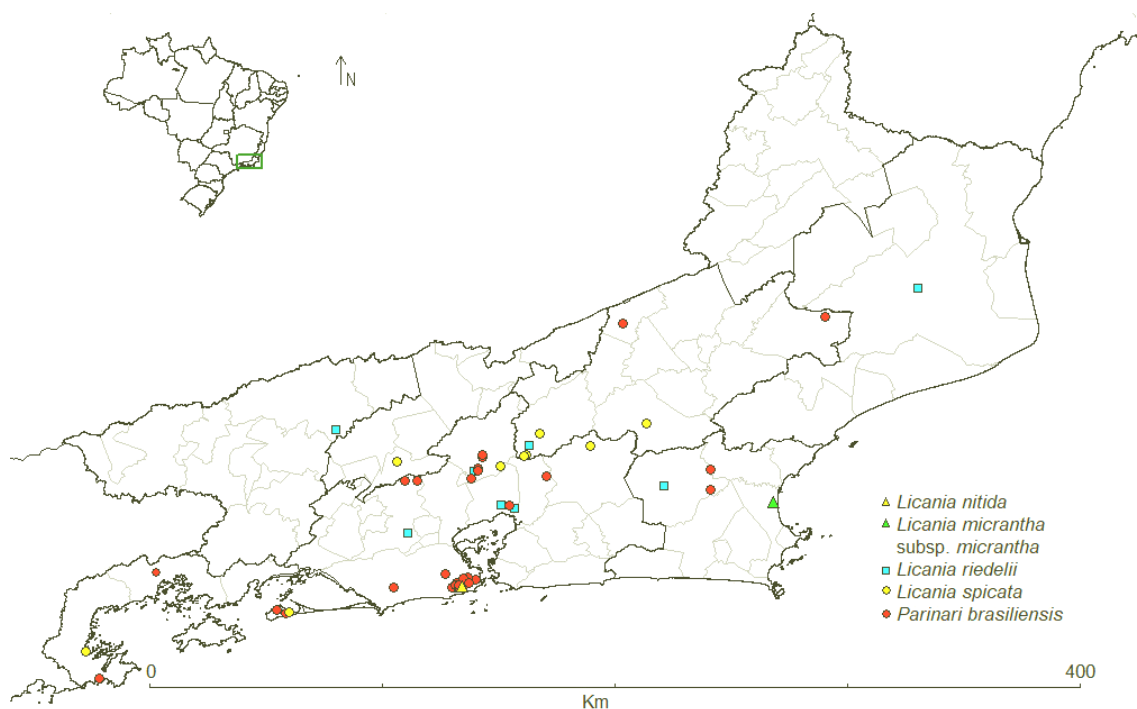
Small- to medium-sized tree; young branches sparsely puberulous, becoming glabrous with age, lenticellate. Leaves elliptic, 8.2–11.8 × 4–5.4 cm, coriaceous, discolorous, base acute, apex acuminate, acumen ca. 5 mm long, glabrous on both sides, stomatal cavities absent, midrib plane adaxially, primary veins 5–7 pairs; petiole 3–5

mm long, glabrous, terete, eglandular; stipules 2, lanceolate, 3–5 mm long, sericeous to glabrous, persistent, chartaceous. Inflorescence terminal to subterminal, racemose panicle, puberulous; bracts 1, filiform to lanceolate, triangular, 4–5 × 0.5–0.9 mm; bracteoles 3, triangular, 0.2–1.5 mm long. Flowers 2.5–3 mm long, pedicel ca. 0.5 mm long; receptacle urceolate, ca. 2 mm long, sericeous on the inside, puberulous on the outside; sepals 5–6, triangular, ca. 1 mm long, puberulous on both sides; stamens 4, ca. 1 mm long, inserted in a complete circle, free, equaling sepals, glabrous; ovary 0.5–2 mm long, sericeous; style 3–4.5 mm long, sparsely sericeous. Drupe ellipsoid to widely ellipsoid, sessile, 1.5–1.8 × 1.3–1.4 cm, epicarp rugose, puberulous.

**Selected material:** Rio de Janeiro, Horto Florestal, XI.1926, fl., *H. Almeida* (RB 136931).

**Additional material:** BRAZIL. MINAS GERAIS: Buenópolis, Serra do Cabral, a 7 km da cidade, 17°53'S, 44°15'W, elev. 950 m, 12.X.1988, fl., *R.M. Harley 24911* (RB).

*Licania nitida* occurs in the states of Bahia and Goiás and all states of the southeastern region (Sothers & Prance 2020e). In the state of Rio de Janeiro it is found only in the municipality of Rio de Janeiro, represented by collections from the 1920s (Fig. 10).



**Figure 10** – *Licania micrantha* subsp. *micrantha*, *L. nitida*, *L. riedelii*, *L. spicata* and *Parinari brasiliensis* distribution map in the state of Rio de Janeiro.

*Licania nitida* has in common with *L. spicata* the urceolate receptacle, an uncommon character among the species analyzed. Furthermore, they also share a near size of their elliptic leaf-blade with acuminate apex, stomatal cavities absent, and puberulous inflorescence. However, *L. nitida* can be distinguished by the combination of persistent lanceolate stipules, 3–5 mm long petiole, leaves with 5–7 pairs of primary veins, and flowers with 4 stamens. Collected with flowers in November and with fruits in December.

**6.10. *Licania riedelii*** Prance, *Fl. Neotrop. Monogr.*, 9: 155. 1972. Figs. 4m-n; 10

Tree or shrub, 1–21 m tall, DBH 14–40 cm, young branches glabrous to tomentose, becoming glabrous to sparsely tomentose with age, lenticellate. Leaves elliptic, 5.7–15 × 2.2–7.2 cm, chartaceous to coriaceous, discolorous, base rounded to cuneate, apex acute to acuminate, acumen 2–3 mm long, adaxially glabrous, sometimes tomentose at base, abaxially glabrous to tomentose and with stomatal cavities, midrib impressed adaxially in the basal half, primary veins 6–9 pairs; petiole 2–7 mm long, glabrous to tomentose, terete to slightly canaliculate, with or without a pair of glands at petiole apex; stipules 2, triangular, 2–6 mm long, chartaceous to coriaceous, sericeous, persistent. Inflorescence terminal, racemose panicle, sparsely pubescent; bracts 1, triangular to lanceolate, 1–3 mm long, pubescent to tomentose; bracteoles 3, triangular, ca. 1–3 mm long, pubescent to tomentose. Flowers 3–5 mm long, pubescent, pedicel 0.7–1 mm long; receptacle urceolate, 2.5–3.5 mm long, pubescent on the inside, sericeous on the outside; sepals 5, triangular, 1–1.5 mm long, sericeous on both sides; stamens 7–9, ca. 1 mm long, inserted in a complete circle, free, equaling sepals, filaments glabrous; ovary ca. 0.5 mm long, sericeous; style 2.5–3 mm long, sericeous or strigose. Drupe ellipsoid to widely ellipsoid, stipitate or not, 2.5–4.2 × 2.3–4.5 cm, epicarp smooth to slightly rugose, glabrous to tomentose, mesocarp fibrous, endocarp thick, sparsely sericeous.

**Selected material:** Campos dos Goytacazes, Maciço do Itaoca, 26.VIII.2011, *T.P. Souza 239* (HUENF). Guapimirim, Estação Ecológica Estadual de Paraíso, 27.VIII.1991, fr., *R. Guedes 2214* (RB). Magé, Paraíso, área do Centro de Primatologia do RJ, 14.X.1984, fr., *H.C. Lima 2178* (RB, MBM, K). Nova Iguaçu, Reserva Biológica do Tinguá, 31.VII.1992, (RBR22264). Petrópolis, Meio da Serra, 12.X.1932, *Victorio* (RB48468). Silva Jardim, Reserva Biológica de

Poço das Antas, fragmento E, 26.XI.1998, *S.V.A. Pessoa* (RB401597). Teresópolis, Venda Nova, fragmento da propriedade do Sr. Waldemar, 19.III.2005, fl., *C.H.R. Paula 727* (RB). Valença, cumeeira acessada por um pasto próximo a Estrada Parque que liga o Parque Estadual da Serra da Concórdia e o Parque Natural Municipal Açude da Concórdia, Parque Estadual da Serra da Concórdia, 2.II.2018, fl., *C. Baez 1412* (RB).

*Licania riedelii* occurs in the states of Minas Gerais and Rio de Janeiro (Sothers & Prance 2020; Sothers *et al.* 2016). In the state of Rio de Janeiro, it is found in Campos dos Goytacazes, Guapimirim, Magé, Nova Iguaçu, Petrópolis, Silva Jardim, Teresópolis, and Valença (Fig. 10). In addition to being well distributed, this species occurs in four conservation units (Estação Ecológica Estadual de Paraíso, Reserva Biológica de Poço das Antas, Reserva Biológica do Tinguá, and Parque Estadual da Serra da Concórdia).

*Licania riedelii* is similar to *L. arianeae*, as above-mentioned. However, it can be distinguished by the size of the stipules (2–6 mm long vs. 5–6 mm long) and urceolate receptacle (vs. campanulate). Collected with flowers in March and with fruits in March, April, August, October, and December.

**6.11. *Licania spicata*** Hook.f., *Fl. bras.* 14(2): 16. 1867. Fig. 10

Tree or shrub, 1.5–27 m tall, DBH 53.15 cm; young branches setose, becoming glabrous to sparsely setose with age, lenticellate. Leaves elliptic, 5.6–11.5 × 1.5–4.1 cm, chartaceous, discolorous, base cuneate, apex acute to acuminate, acumen 1–1.6 cm long, glabrous on both sides, stomatal cavities absent, midrib impressed adaxially, primary veins 6–8 pairs; petiole 0.5–1.1 cm long, sericeous, canaliculate, eglandular; stipules caducous. Inflorescence terminal, racemose panicle, puberulous; bracts caducous; bracteoles 3, triangular, ca. 1 mm long, puberulous. Flowers 2.5–3 mm long, sessile, pubescent, receptacle urceolate, ca. 1.9 mm long, sericeous on the inside, puberulous to tomentose on the outside; sepals 5, triangular, 1–1.5 mm long, adaxially puberulous, abaxially puberulous to tomentose; stamens 5, ca. 1 mm long, inserted in a complete circle, free, included, filaments glabrous; ovary ca. 1 mm long, sericeous; style ca. 1 mm long, sparsely sericeous. Drupe ellipsoid, stipitate, 1.3–1.6 × 0.9–1.1 cm, epicarp smooth, pubescent.

**Selected material:** Cachoeiras de Macacu, Parque Estadual dos Três Picos/Reserva Ecológica de Guapiaçu, trilha verde, 22°24'53"S, 42°44'9"W, 19.I.2018, fl., *C. Baez 1346* (RB). Mangaratiba, Ilha da Marambaia, cota

100 m, parcela 35, planta 12, Vertente Baía de Sepetiba, seguindo à direita do Totem, antes da Bacia Hidrográfica, 3.III.2008, *R.S. Nunes 37* (RBR). Miguel Pereira, Monte Sinai, Governador Portela, fl., fr., 40 (R21337). Nova Friburgo, Alto Macahé, 16.II.1892, fl., *A.F.M. Glaziou 19137* (K, P, US). Paraty, lado esquerdo da estrada Rio-Santos, em direção a Santos, próx. à divisa do estado do Rio de Janeiro com o estado de S. Paulo, área de Proteção Ambiental Cairuçu, 13.IV.1991, fr., *L.C. Giordano 1079* (RB, HUEFS). Petrópolis, Villa Thereza, 18.I.1876, fl., *A.F.M. Glaziou 8399* (P, US). Teresópolis, Organ Mts., 1878, fl., *J. Miers 4095* (K, NY, BM, A, P).

*Licania spicata* occurs in the states of Bahia, Espírito Santo, Minas Gerais, and Rio de Janeiro (Sothers & Prance 2020e; Prance & Sothers 2003; Sothers *et al.* 2016). In the state of Rio de Janeiro, it is found in Cachoeiras de Macacu, Mangaratiba, Miguel Pereira, Nova Friburgo, Paraty, Petrópolis, and Teresópolis (Fig. 10). It is reported in four conservation units, Área de Proteção Ambiental de Cairuçu, Parque Nacional da Serra dos Órgãos, and Parque Estadual dos Três Picos/Reserva Ecológica de Guapiaçu.

*Licania spicata* is similar to *L. hoehnei*, *L. indurata* and *L. nitida*, as above-mentioned. However, it can be distinguished by the combination of setose young branches, becoming glabrous to sparsely setose with age, leaves with petioles 0.5–1.1 cm long, and sessile flowers with an urceolate receptacle. Collected with flowers from January to March and with fruits in April and June.

Popular name: Milho-cozido (*s/c* 40 (R 21337); *A. Glaziou 11943*).

## 7. *Parinari* Aubl.

Pantropical genus with 39 species, out of which 14 are recorded for Brazil (Barbosa-Silva 2020; Prance 2003). One species occur in the state of Rio de Janeiro, *Parinari brasiliensis*.

### 7.1. *Parinari brasiliensis* (Schott) Hook.f., *Fl. bras.* 14(2): 51. 1867.

Basionym: *Petrocarya brasiliensis* Schott, in Spreng., *Syst. Veg.*, 4(2): 405. 1827.

Figs. 4o–p; 10

Tree, up to 20 m tall, DBH 50–60 cm; young branches villous, becoming glabrous with age, lenticellate. Leaves elliptic, 5.4–18 × 1.9–6 cm, chartaceous, discolorous, base cuneate, apex acute to acuminate, acumen 3–5 mm long, margin with discoid glands abaxially, glabrous adaxially, tomentose to villous abaxially, midrib plane to impressed adaxially, prominent and tomentose abaxially, primary veins 15–20 pairs,

sparsely tomentose abaxially; petiole 4–9 mm long, glabrous, velutinous or sparsely tomentose, canaliculate, with 2 glands at middle; stipules caducous. Inflorescence terminal, paniculate, pubescent to densely pubescent, bracts ca. 2 mm long, triangular. Flowers 3–7 mm long, pubescent outside, pedicel 1.5–4 mm long; receptacle campanulado, interior pubescent at base, sericeous at apex; sepals triangular, 1.5–4 mm long, glabrous to puberulent inside; petals triangular to rounded, 1.5–2.5 mm long, glabrous at base, glabrous to puberulent at apex on both sides; stamens 7–9, inserted unilaterally or in 3/4 circle, ca. 2 staminodes; ovary 1–4 mm long, sericeous, style 3–5 mm long, basal half sericeous to lanate. Drupe ellipsoid, 2.2–3.5 × 1.4–1.8 cm; epicarp glabrous, sparsely tomentose at base, lenticellate, rugose; mesocarp airy; endocarp tomentose.

**Selected material:** Angra dos Reis, Parque estadual da Ilha Grande, 5.XII.1991, *A.T. Silva* (RBR32941). Campos dos Goytacazes, Imbé, 21°50'49"S, 41°47'49"W, 19.XI.1997, fr., *M.R. Moreno 282* (HUEF). Carmo, Rio de Janeiro, III.1889, *A.F. Armond 175* (NY). Guapimirim, interior de fragmento florestal localizado na propriedade do Sr. Renato Cozzolino, *R. Finotti 250* (RFA). Magé, Paraíso, floresta em volta do Centro de Primatologia, Estação Ecológica do Paraíso, 30.X.1984, *L. Sonkin 340* (RB). Mangaratiba, Ilha de Marambaia, área da gruta, floresta atlântica de encosta, 25.VI.2005, *F.C. Nettesheim 88* (RBR). Miguel Pereira, Reserva Biológica do Tinguá, Vera Cruz, Rio de São Pedro, faixa de manutenção do Oleoduto ORBEL II, próximo ao Mirante, 15.III.2007, *H.C. de Lima 6575* (RB). Paraty, Condomínio Laranjeiras, 23°19'S, 44°39'O, 15.XI.1993, fl., *M.I.M. Hernandez 30119* (HUEFS). Petrópolis, bairro Amoêdo, XII.1943, fl., fr., *O.C. Góes 1046* (RB, NY). Rio de Janeiro, Villa Nova, estrada de Cantagalo, 22.XI.1882, fl., *A.F.M. Glaziou 13796* (R, P, CEN). Silva Jardim, Reserva Biológica Poço das Antas, trilha do Cambuí Preto, 9.VIII.1995, fr., *C. Luchiarri 687* (RB).

*Parinari brasiliensis* is recorded for the states of Alagoas, Bahia, Minas Gerais, Espírito Santo, Paraná, Pernambuco, Santa Catarina, São Paulo, and Rio de Janeiro (Barbosa-Silva 2020). In the state of Rio de Janeiro, it occurs in Angra dos Reis, Campos dos Goytacazes, Carmo, Guapimirim, Magé, Mangaratiba, Miguel Pereira, Paraty, Petrópolis, Rio de Janeiro, and Silva Jardim (Fig. 10). This species is reported as rare and classified as “Endangered” (EN) for Brazil (Amorim *et al.* 2013). In Rio de Janeiro, it is common in forest areas and has been recorded in conservation units (Área de Proteção Ambiental da Região Serrana de Petrópolis, Estação Ecológica do Paraíso. Parque Estadual da Ilha Grande, Parque Nacional da

Tijuca, Reserva Biológica de Poço das Antas, and Reserva Biológica do Tinguá).

*Parinari brasiliensis* can be recognized as generally having leaves with a higher number of primary pairs of veins (15–20), stomatal cavities and marginal glands. *Parinari brasiliensis* and *P. excelsa* integrate the *P. excelsa* species complex and are not easily distinguished (Prance 1972). *P. excelsa* used to be reported in the state of Rio de Janeiro, but new data show that it does not occur in Brazil (Barbosa-Silva 2020). Collected with flowers in October to December and with fruits in April, May, July, August, and December.

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