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Flora of Espírito Santo, Brazil

Flora of Espírito Santo: *Inga* (Fabaceae, Mimosoid clade)

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Abstract

This study aims to assess the diversity of *Inga* in the state of Espírito Santo (ES), in order to establish diagnostic characters and circumscription of the species through a detailed analysis of botanical collections. This analysis was based on morphological analysis of specimens collected in the ES and deposited in herbarium collections. The study provides identification keys, descriptions, illustrations, taxonomic comments, geographic distributions, distribution patterns, and phenology data for the species. Twenty-six taxa of *Inga* were recognized in ES. Of these, 14 (52%) are endemic to Brazil, one of which, *Inga teresensis*, is restricted to ES. Species of *Inga* occur predominantly in dense ombrophilous forest (23 taxa), followed by seasonal semideciduous forest (16 taxa), open ombrophilous forest (nine taxa), and pioneer formations (eight taxa). Among dense ombrophilous forests, a higher diversity of *Inga* species was present in slope forests (22 taxa) than *tabuleiro* forests (15 taxa). *Inga aptera*, *I. cabelo*, *I. maritima*, *I. platyptera*, and *I. unica* are listed as threatened. The distribution of four taxa, *I. aptera*, *I. ciliata* subsp. *ciliata*, *I. cylindrica*, and *I. subnuda* var. *luschnatiana* was extended to ES.

Key words: Atlantic Forest, Brazil, floristic, Leguminosae, taxonomy.

Resumo

Este estudo teve como objetivo conhecer a diversidade de *Inga* no Espírito Santo, a fim de estabelecer caracteres diagnósticos e a circunscrição das espécies por meio da análise detalhada de coleções botânicas. Os estudos foram baseados na análise morfológica de espécimes coletados no Espírito Santo, além daqueles depositados nos acervos de herbários. São fornecidas chaves para identificação, descrições, ilustrações, comentários taxonômicos, distribuição geográfica, padrões de distribuição e dados de fenologia para as espécies. Foram reconhecidos 26 táxons infragenéricos de *Inga* para o Espírito Santo. Destes, 14 espécies (52%) são endêmicas do Brasil e apenas uma, *Inga teresensis*, é restrita ao estado do Espírito Santo. As espécies de *Inga* ocorrem, predominantemente, em floresta ombrófila densa (23 táxons), seguida pela floresta estacional semidecidual (16 táxons), pela floresta ombrófila aberta (9 táxons) e pelas formações pioneiras (8 táxons). A floresta ombrófila densa, apresentou maior riqueza na mata de encosta (22 spp) do que em mata de tabuleiro (15 spp). *Inga aptera*, *I. cabelo*, *I. platyptera*, *I. maritima* e *I. unica* estão categorizadas como ameaçadas de extinção. A distribuição de quatro táxons foi ampliada para o Espírito Santo: *I. aptera*, *I. ciliata* subsp. *ciliata*, *I. cylindrica* e *I. subnuda* subsp. *luschnathiana*.

Palavras-chave: Floresta Atlântica, Brasil, florística, Leguminosae, taxonomia.

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Introduction

Inga is a monophyletic genus that can be easily recognized by its pinnate leaves, conspicuous leaf nectaries between pairs of leaflets, nucoid legume fruit type, and seeds surrounded by sweet white sarcotesta (Pennington 1997; Richardson *et al*. 2001). The genus is comprised of about 300 species distributed in tropical and subtropical forests between Mexico and Uruguay, with representatives in the Greater and Lesser Antilles (Pennington 1997; Lewis & Rico Arce 2005). It is the third largest genus of the mimosoid clade and the largest of the Ingeae tribe (Lewis & Rico Arce 2005; LPWG 2017). Brazil is one of the major centers of diversity of the genus, with 134 species, of which 52 are endemic (BFG 2018). The Atlantic Forest is one of the main centers of endemism in Brazil (Pennington 1997; Garcia 1998). So far, 26 species have been reported in Espírito Santo (ES) by Dutra *et al.* (2015).

The taxonomic studies involving *Inga* species in Brazil include the following: Garcia (1998) for species in the forests of the southern and southeastern coasts of Brazil; Possette & Rodrigues (2010) for the Flora of the Paraná (PR) state; Fernandes (2011) for the Flora of Minas Gerais (MG); Bonadeu & Santos (2013) for the Caxiuanã National Forest in Pará (PA); Vasconcelos (2014) for the Flora of Paraíba (PB), and Garcia (2016) for the Flora of São Paulo (SP). In ES, studies involving the mimosoid clade have included species of *Inga*, such as that of Peterle *et al.* (2015), who studied the species of Mimosoideae in the Paulo César Vinha State Park, and that of Silva *et al.* (2018) on Leguminosae from the Jacarenema restinga. In addition, floristic studies have been carried out in several phytophysiognomies that list species of *Inga*. These include Giaretta *et al.* (2013) on the coastal dunes of Conceição da Barra; Saiter & Thomaz (2014) at the Santa Lucia Biological Reserve; Siqueira *et al.* (2014) at the Vale Nature Reserve; Souza *et al*. (2016) at the Itaúnas State Park; Borges & Azevedo (2017) at Cachoeira da Fumaça State Park, and Moreira *et al.* (2020) in Caparaó National Park.

In this study, we present the richness of *Inga* in ES providing an identification key, descriptions for the recognition of taxa, illustrations, comments on taxonomy, geographical distribution, phenology data, and local names. This effort represents a continuation of studies on the family Fabaceae of the Flora of ES.

Material and Methods

The taxonomic study started in 2012 and was based on a morphological analysis of specimens collected in ES and deposited in the collections of the herbaria CEPEC, CVRD, ESA, HRCB, HUEFS, NY, MBM, MBML, MO, R, RB, SAMES, UEC, UPCB, VIC, and VIES (acronyms according to Thiers, continuously updated), as well as complementary field expeditions of specimens in protected areas. The samples of fertile branches (with leaves, flowers, and/or fruits) were collected and herborized according to Fidalgo & Bononi (1989) and deposited in the VIES herbarium, with duplicates for the VIC, MBML, and RB herbaria.

The identification of the examined specimens was performed based on morphological analysis, using the taxonomic literature (Garcia 1998; Pennington 1997) and comparisons with herbarium specimens and digital images of the types and exsiccates available at the Herbário Virtual Reflora (<http://reflora.jbrj.gov.br/reflora/herbarioVirtual/ConsultaPublicoHVUC/ConsultaPublicoHVUC.do>) and INCT-HVFF (<http://inct.splink.org.br/>).

The morphological analysis included measurements of the vegetative parts in dehydrated material, while the floral parts were measured using material stored in ethanol or rehydrated dried material. Descriptions include qualitative and quantitative variations for each species. Measurements were obtained with a digital caliper and taken at the point of greatest length and/or width of the adult structures; structures with a support axis of up to 1 mm in length were considered subsessile. The terminology used in the morphological descriptions is based on Radford *et al.* (1974), except for leaf nectaries and fruit, which were based on Fernandes (2011) and Barroso *et al*. (1999), respectively. The illustrations were made from herborized botanical samples using a stereomicroscope. The taxonomic treatment presents the selected specimens, a single representative material selected by municipality in ES, but a list of the other specimens analyzed and identified is given as additional material examined.

The geographic distribution and occurrence data in the different vegetation formations were extracted from the labels of the examined specimens, as well as georeferenced collections, the Herbário Virtual INCT-HVFF database (<http://inct.splink.org.br/>), the Herbário Virtual Reflora (<http://reflora.jbrj.gov.br/reflora/herbarioVirtual/

ConsultaPublicoHVUC/ConsultaPublicoHVUC.do>), and review studies on the genus. The distribution map of the species was made with QGIS 2.8, using WGS84/lat-long as the coordinate reference system. Specimens without geographic coordinates were georeferenced using the locality of the collection and the geoLoc tool (<http://splink.cria.org.br/geoloc>). The vegetation formations followed the classification of Garbin *et al.* (2017): dense ombrophilous forest (covering slopes forests located in mountainous regions and *tabuleiro* forests, found in wet coastal lowlands), open ombrophilous forest, seasonal semideciduous forest, pioneer formations (heath, *restingas*, set of coastal vegetation over marine sandy deposits of the Quaternary, mangrove), and ecological refuge (in ES represented by montane grasslands, composed of herbaceous vegetation and small shrubs, which occur on litolic soils in the Serra do Caparaó).

Results and Discussion

Inga is represented in ES by 26 taxa, totaling about 20% of the species reported in Brazil for this genus (BFG 2018). This species richness in the state is mainly due to its vegetation cover, restricted to the domain of the Atlantic Forest, which represents one of the main diversity centers of *Inga.* Ombrophilous dense forests contain 88% of the state's species, six of which are only found in this vegetation type (*I. aptera*, *I. cabelo*, *I. ciliata* subsp. *ciliata*, *I. lanceifolia*, *I. subnuda* subsp. *luschnatiana*, and *I. teresensis*). Semideciduous seasonal forests are home to 61.5%, of the taxa, with *I. vulpina* found only in this vegetation type. No species are limited to open ombrophilous forests, though 34.6% of the state's taxa are found there. Of the 30% of taxa present in pioneer formations, only *I. maritima* is found nowhere else in the state. Only one species occurs in ecological refuge, namely *I. cylindrica*. In addition, we detected nine taxa occurring in vegetational types not previously mentioned in the literature.

Of the inventoried taxa, *I. aptera*, *I. ciliata* subsp. *ciliata*, *I. cylindrica*, and *I. subnuda* subsp. *luschnathiana* were added to the angiosperm list for ES (Dutra *et al.* 2015; Garcia & Bonadeu 2020). The species, *I. aptera*, *I. cabelo*, *I. maritima*, *I. platyptera*, and *I. unica* are cited as threatened (Martinelli *et al.* 2013; Fraga *et al.* 2019).

Inga barbata Bentham (1845: 604), *I. congesta* T.B.Pennington (1997: 681), *I. cordistipula* Martius (1837: 111), and *I. sellowiana* Bentham (1845: 583), which were previously mentioned as occurring in ES by Dutra *et al.* (2015), have not been confirmed to occur in the state. *Inga barbata*, *I. congesta*, and *I. cordistipula* had been identified in the literature, but no vouchers confirmed their occurrence in ES. Meanwhile, the voucher of *I. sellowiana*, Kollmann 7173 (MBML, RB) had characteristics that do not correspond to this species, and its identity is being investigated.

Inga Mill.

Trees, treelets or shrubs, 2–26 m tall; branches unarmed. Leaves paripinnate; stipules persistent or caducous; rachis terete, marginate or winged; foliar nectaries present between each pair of leaflets, rarely absent, sessile, subssessile, stalked or shortly stalked; eucamptodromous or brochidodromous venation. Inflorescence homomorphic, solitary or fasciculate, raceme, spike, capitate or umbellate, axillary or ramiflorous; bracts caducous or persistent. Flowers 5–7-merous; monadelphous, filaments whitish or pink, staminal tube included or exserted; disc nectariferous present or absent; ovary 1–2-carpellate. Legume nucoid, plane, convex, cylindric, subcylindric or quadrangular, margins narrow or expanded; seeds with the testa developing a thick white sugary sarcotesta, pleurogram absent.

Identification key to the taxa of *Inga* from Espírito Santo state

1. Young branches glabrous, glabrescent, subglabrous, puberulent, pubescent, tomentose or villous. Foliar nectaries sessile to subssessile or absent 2
    2. Foliar nectaries absent ..... 24. *Inga unica*
    2'. Foliar nectaries present 3
        3. Leaflets glabrous 4
            4. Foliar nectaries cyathiform or cupuliform. Inflorescence capitate 5
                5. Stipules oblong; leaflets 2–3 pairs, elliptic ..... 11. *Inga lanceifolia*
                5'. Stipules linear; leaflets (3–)4–11, elliptic to rhombic ..... 21. *Inga tenuis*
            4'. Foliar nectaries patelliform. Inflorescence umbellate, spike 6

6. Old branches exfoliating. Stipules filiform ..... 7. *Inga exfoliata*
6'. Old branches no exfoliating. Stipules elliptic, falcate, lanceolate or ovate 7
7. Foliar rachis winged (wing > 3 mm larg)..... 14. *Inga marginata*
7'. Foliar rachis terete, canaliculate or marginate (wing < 2 mm larg) 8
8. Stipules lanceolate; petiole marginate..... 12. *Inga laurina*
8'. Stipules elliptic, falcate or ovate; petiole terete or canaliculate..... 9
9. Young branches tomentose. Leaflets 3–4 pairs. Legume nucoid constricted between the seeds ..... 5. *Inga cylindrica*
9'. Young branches glabrous, subglabrous or glabrescent. Leaflets (1–)2–3 pairs. Legume nucoid plane 10
10. Inflorescence umbellate. Nectary disk absent in flowers ..... 8. *Inga flagelliformis*
10'. Inflorescence a congest or lax spike. Nectary disk present in flowers ..... 3. *Inga capitata*

3'. Leaflets tomentose, villous or glabrescent abaxially 11
11. Foliar rachis winged at least between the pairs of terminal leaflets..... 12
12. Bracts linear or narrowly elliptic. Calyx striate ..... 18. *Inga striata*
12'. Bracts ovate or elliptic. Calyx no striate 13
13. Foliar nectaries cupuliform 14
14. Stipules 4–13 mm long, lanceolate to linear. Calyx villous or sericeous..... 15
15. Stipules 4–7 mm long, lanceolate to linear; leaflets tomentose. Inflorescence spike. Calyx open in bud, 5–12.4 mm long. Legume nucoid cylindric, margins expanded, tomentose ..... 6. *Inga edulis*
15'. Stipules 9–13 mm long, lanceolate; leaflets villous to glabrescent adaxially, villous abaxially. Inflorescence a lax raceme. Calyx closed in bud, 15–25 mm long. Legume nucoid plane, margins narrow, velutinous..... 17. *Inga sessilis*
14'. Stipules 1.5–3 mm long, ovate. Calyx tomentose 16
16. Stipules 1.5–2.2 mm long; rachis terete to winged, at least between the pairs of terminal leaflets. Legume nucoid subcylindric to cylindric, faces covered ..... 20. *Inga subnuda* subsp. *subnuda*
16'. Stipules 2.5–3 mm long; rachis winged. Legume nucoid quadrangular, faces exposed..... 19. *Inga subnuda* subsp. *luschnathiana*
13'. Foliar nectaries patelliform 17
17. Young branches villous. Corolla 9–10 mm long. Legume nucoid subcylindric, margins narrow, glabrescent..... 15. *Inga maritima*
17'. Young branches tomentose. Corolla 15–20 mm long. Legume nucoid cylindric or quadrangular, margins expanded, tomentose 18
18. Leaflets villous abaxially. Bracts 2–3 mm long. Legume nucoid cylindric, faces covered ..... 10. *Inga ingoides*
18'. Leaflets tomentose abaxially. Bracts 3.6–4.5 mm long. Legume nucoid cylindric to quadrangular, faces exposed..... 25. *Inga vera* subsp. *affinis*

11. Foliar rachis terete, margins narrow or marginate 19
19. Foliar nectaries patelliform. Calyx 18–21 mm long, inflated, villous; corolla 25–28 mm long. Legume nucoid villous..... 1. *Inga aptera*
19'. Foliar nectaries cupuliform. Calyx 3–6 mm long, no inflated, tomentose; corolla 13–24.5 mm long. Legume nucoid tomentose 20
20. Leaflets glabrescent adaxially, tomentose abaxially. Bracts 0.5–1.5 mm long. Legume nucoid plane, margins narrow ..... 23. *Inga thibaudiana* subsp. *thibaudiana*
20'. Leaflets sparsely villous adaxially, villous abaxially. Bracts 1.5–2.1 mm long. Legume nucoid subcylindric to cylindric, margins expanded..... 20. *Inga subnuda* subsp. *subnuda*

1’. Young branches hirsute or hispid. Foliar nectaries stalked, rarely sessile 21
21. Foliar nectaries cupuliform or cyathiform. Bracts 13–17 mm long..... 16. *Inga platyptera*
21’. Foliar nectaries capitate, cylindric or terete. Bracts 0.5–8.7 mm long 22
22. Branches hispid. Calyx sericeous. Legume nucoid hispid..... 9. *Inga hispida*
22’. Branches hirsute. Calyx hirsute. Legume nucoid hirsute or villous 23
23. Leaflets 1–2 pairs, hirsute adaxially. Legume nucoid villous ..... 22. *Inga teresensis*
23’. Leaflets 2–11 pairs, glabrous or glabrescent adaxially. Legume nucoid hirsute..... 24
24. Foliar rachis terete, rarely winged. Legume nucoid 3–3.5 cm width..... ..... 2. *Inga cabelo*
24’. Foliar rachis winged. Legume nucoid 1.5–2.7 cm width 25
25. Inflorescence raceme. Flowers pedicellate; corolla sericeous..... ..... 4. *Inga ciliata* subsp. *ciliata*
25’. Inflorescence spike. Flowers sessile; corolla hirsute..... 26
26. Stipules 5–15 mm long. Bracts 3.6–8.7 mm long, lanceolate to elliptic, persistent. Calyx 3.2–5.7 mm long; filaments whitish ....13. *Inga leptantha*
26’. Stipules 3–4 mm long. Bracts ca. 0.5 mm long, ovate, caducous. Calyx 7–10 mm long; filaments pink.....26. *Inga vulpina*

1. *Inga aptera* (Vinha) T.D.Penn., Gen. *Inga*: Bot. 678-681, 1997.

Trees ca. 3 m tall; young branches villous, not exfoliating. Stipules caducous; petiole 2.7–3.6 cm long, terete, pubescent; rachis 6.7–9.1 cm long, terete to margins narrow; foliar nectaries sessile, patelliform, circular to elliptic; leaflets 2–3 pairs, 9.6–13.4 × 4.5–6.7 cm, elliptic to obovate, apex acuminate, base acute to obtuse, glabrous adaxially, villous abaxially. Inflorescence axillary, solitary, a congested spike; peduncle 16–100 mm long, villous; floral rachis 55–73 mm long; bracts caducous. Flowers sessile; calyx open in bud, 18–21 mm long, campanulate, no striate, inflated, villous; corolla 25–28 mm long, campanulate, sericeous; androecium with c. 200 stamens, ca. 45 mm long, staminal tube included, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous at the beginning of development. Legume nucoid 9–10 × 1.6 cm, plane to convex, margins narrow, straight, villous.

Selected specimens: Ecoporanga, -18.3733, -40.8306, 6.XII.2012, fl., *D.A. Folli 6981* (CVRD, HUEFS). Santa Teresa, Pedra da Onça, -19.9356, -40.6003, 1.VI.2000, fr., *A.M. Amorim 3407* (CEPEC).

Previously thought to be restricted to the southern coast of Bahia (BA) (Pennington 1997; Garcia 1998; BFG 2018), this is the first record of its occurrence in ES, where it has been found in the dense ombrophilous forest (Fig. 1). *Inga aptera* has been assigned to the vulnerable (VU) category (Martinelli *et al.* 2013) due to the fragmentation of forest remnants from urban expansion, agricultural activities, and the exploitation of forest resources. Only two records of the species exist in the extreme northwest and montane regions of ES, which is why we assign the species locally to the Data Deficient (DD), based on IUCN (2012), as there is not enough information to evaluate its threat of extinction.

Inga aptera has 2–3 pairs of leaflets, villous on the abaxial face, and a campanulate and inflated calyx, characteristics that differ from other *Inga* species in ES. Collected with flowers in December and with fruits in June. Local name: *ingá-preta*.

2. *Inga cabelo* T.D. Penn., Gen. *Inga*: Bot. 525-527. 1997. Fig. 2a-f

Trees 5–9 m tall; young branches hirsute, not exfoliating. Stipules 1.6–2.5 mm long, linear to lanceolate, persistent; petiole 0.3–1 cm long, terete, rarely winged, hirsute; rachis 1–5.5 cm long, terete, rarely winged; foliar nectaries stalked, capitate to terete, circular; leaflets 2–4 pairs, 5–13 × 2.4–4.2 cm, elliptic, oblanceolate or obovate, apex acute to cuspidate, base rounded to acute, glabrescent adaxially, sparsely hirsute abaxially. Inflorescence axillary, solitary, a lax spike; peduncle 20–45 mm long, hirsute; floral rachis 8–22 mm long; bracts 1.8–2.5 mm long, lanceolate to triangular, caducous. Flowers sessile; calyx open in bud, 3.4–5 mm long, tubular, no striate, no inflated, hirsute; corolla 11.8–17.5 mm long, infundibuliform, sericeous; androecium with 30–42 stamens, 51.5–42.5 mm long, staminal tube included, 14.7–18.3 mm long,

filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 12–14 × 3–3.5 cm, plane, margins narrow, straight, hirsute. **Selected specimens**: Conceição da Barra, Reserva Biológica de Córrego Grande, -18.2348, -39.8266, 5.VI.2011, fr., *M. Ribeiro & T.R.R. Almeida 540* (SAMES). Linhares, Reserva Florestal da CVRD, -19.3910, -39.1099, 20.VII.1978, fl., *I.A. Silva 6* (CVRD, MO, RBR,). Santa Teresa, São João de Petrópolis, -19.9356, -40.6003, 3.VIII.2000, fl., *V. Demuner et al. 1335* (MBML). Sooretama, Reserva Biológica de Sooretama, -19.1167, -40.1333, 25.V.2017, fl., *L.F.T. Menezes* (SAMES 7182). Vila Velha, Morro do Moreno, -20.3264, -40.2772, 8.XI.2009, fr., *R.T Valadares & V.B. Sarnaglia Jr. 957* (VIES). Vitória, Parque Estadual da Fonte Grande, -20.3073, -40.3420, 26.IX.2003, fl., *O.J. Pereira & J. Martins 7309* (VIES).

Restricted to eastern Brazil, it occurs in the states of ES, MG, and Rio de Janeiro (RJ), in the Atlantic Forest domain (Pennington 1997; Garcia 1998; BFG 2018). In ES, it was recorded in dense ombrophilous forest in areas of slope forests, although it is mainly found in *tabuleiro* forests (Fig. 1). These records expand the distribution posited by Garcia (1998) for *I. cabelo* in the Atlantic Forest, who only cited it in the lowland dense ombrophilous forest. Due to the fragmentation of its habitat, it has been assigned to the VU category (Fraga *et al.* 2019).

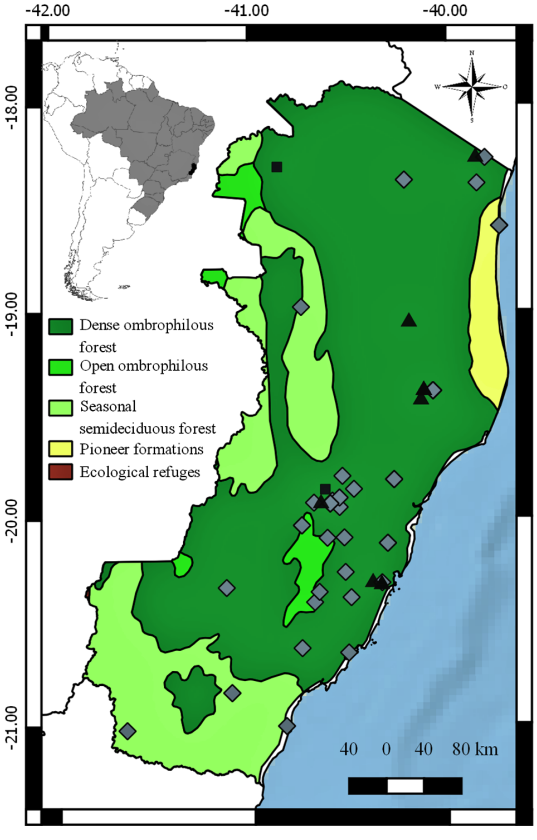

Figure 1 – Geographic distribution of *Inga* species in the state of Espírito Santo (black square = *I. aptera*; black triangle = *I. cabelo*; grey diamond = *I. capitata*).

In ES, *Inga cabelo* is vegetatively similar to *I. vulpina* due to its hirsute indumentum of young branches, foliar nectaries stalked, and shape of the leaflets. However, it is distinguished by the cylindrical leaf rachis, lax inflorescence, and calyx with filiform lobes, while *I. vulpina* has winged rachis, congested inflorescence, and calyx with acute lobes. Collected with flowers from July to September and November and with fruits from June to November. Local name: *ingá-cabelo*.

3. *Inga capitata* Desv., J. Bot. (Desvaux) 3: 71. 1814. Fig. 2g-o

Trees 2.5–15 m tall; young branches glabrous or subglabrous, not exfoliating. Stipules 3–16.5 mm long, elliptic, falcate or ovate, caducous or persistent; petiole 0.4–4 cm long, terete to canaliculate, glabrous to puberulent; rachis 1.2–11 cm long, terete or canaliculate; foliar nectaries sessile, patelliform, circular, usually sunken in the rachis; leaflets (1–)2–3 pairs, 5.2–18 × 2.4–6.5 cm, elliptic, rarely oblanceolate, apex acuminate to acute, rarely cuspidate, base attenuate, glabrous. Inflorescence axillary, solitary or fasciculate, a congest or lax spike; peduncle 16–100 mm long, glabrous to puberulent; floral rachis 0.4–5.5 mm long; bracts 0.5–9.5 mm, elliptic to falcate, persistent. Flowers sessile, rarely pedicellate; pedicel ca. 2 mm long; calyx closed in bud, 3.2–11.8 mm long, infundibuliform or tubular, no striate, no inflated, glabrous; corolla 6–14 mm long, infundibuliform, glabrous, apex puberulent; androecium with 30–80 stamens, 15–48.6 mm long, staminal tube included to exserted, 6.5–16.6 mm long, filaments whitish; nectary disk present; gynoecium 1 carpel; ovary glabrous. Legume nucoid 6.7–24 × 2–3.3 cm, plane, margins narrow, straight, glabrous.

Selected specimens: Águia Branca, Bragança, Córrego Jabuticaba, -18.9831, -40.7402, 30.XI.2006, fl., *L.F.S. Magnago et al. 1688* (MBML, VIES). Alfredo Chaves, Santa Luzia, -20.6350, -40.7497, 18.X.2000, *G. Hatschbach et al. 71402* (CEPEC, MBM, MBML, RB). Aracruz, Coqueiral, -19.8203, -40.2733, 16.I.1992, *R.N. Oliveira 65* (RB, VIES). Cachoeiro de Itapemirim, R.F. Bananal do Norte, -20.8488, -41.1128, 12.VII.1995, fl., *G. Acácio 196* (VIES). Cariacica, Reserva Biológica

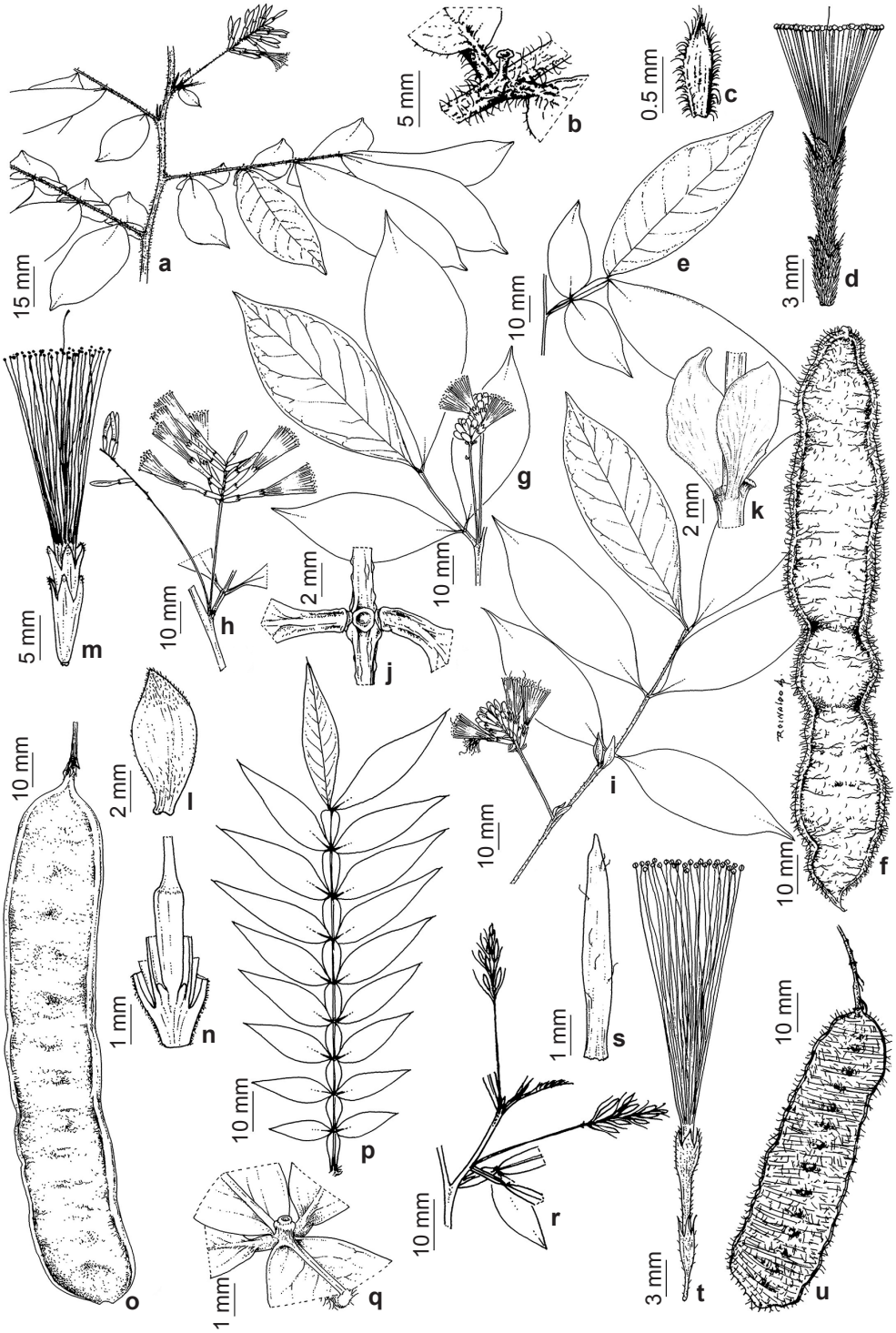

Figure 2 – a-f. *Inga cabelo* – a. reproductive branch; b. foliar nectary; c. bract. d. flower; e. leaf with petiole and winged rachis; f. legume. g-o. *Inga capitata* – g. reproductive branch; h. inflorescence; i. reproductive branch; j. foliar nectary; k. stipule; l. bract; m. flower; n. ovary with nectary disk; o. legume. p-u. *Inga ciliata* subsp. *ciliata* – p. leaf; q. foliar nectary; r. inflorescence; s. bract; t. flower; u. legume. (d. *D.A. Folli 1397*; e. *M. Ribeiro & T.R.R. Almeida 540*; f. *D.A. Folli 822*; g. *H.C. de Lima 1773*; h. *R.T. Valadares & A.L.S.S. Peres 904*; n. *O.J. Pereira et al. 3822*; o. *P.H.D. Barros et al. 209*; t. *D.A. Folli 6571*; u. *V. Demuner et al. 2317*).

de Duas Bocas, -20.2666, -40.4200, 22.VII.2008, fr., *R. Goldenberg et al. 1220* (UPCB, RB). Conceição da Barra, área 157 da Aracruz Celulose S.A., -18.5932, -39.7322, 9.IX.1992, fl., *O.J. Pereira et al. 3822* (VIC, VIES). Domingos Martins, Rio Jucu, -20.3633, -40.6591, 15.III.2001, fl., *O.J. Pereira & E. Espindula 6923* (VIES). Governador Lindemberg, Pedra de Santa Luzia, -19.2667, -40.4833, 26.IV.2007, fl., *V. Demuner et al. 3887* (MBML, VIES). Guarapari, Parque Estadual Paulo César Vinha, -20,6580, -40.5110, 23.12.2008, fl. and fr., *P.L. Peterle et al. 1* (VIES). Ibiraçu, APA Goiapaba-açu, -19.8319, -40.3697, 7.II.2007, fl., *A.P. Fontana et al. 2798* (MBML, RB). Itapemirim, -21.0111, -40.8339, 1.IV.2009, fl., *L.C. Fabris et al. 884* (VIES). Linhares, Canivete, -19.3910, -40.0722, 19.X.2009, fl., *R.T. Valadares & A.L.S.S. Peres 904* (VIC, VIES). Marechal Floriano, Victor Hugo, -20.4127, -40.6831, 15.I.2008, fr., *J.W. Calatrone 50* (VIES). Pinheiros, Reserva Biológica Córrego do Veado, mata da água limpa, -18.3703, -40.2139, 24.I.2011, fr., *A. Giaretta et al. 921* (SAMES). Santa Maria de Jetibá, Caramuru, Sítio Jetibá, -20.0963, -40.6769, 18.III.2003, fl., *H.Q. Boudet Fernandes 3319* (MBML, VIES). Santa Leopoldina, Alto Rio das Farinhas, -20.1000, -40.5300, 15.IV.2008, fr., *L. Kollmann et al. 10846* (MBML, RB). Santa Teresa, Estação Biológica de São Lourenço, -19.9356, -40.6002, 22.IX.1998, fl., *L.J.C. Kollmann 586* (MBML, VIES). São José do Calçado, estrada para Arituba, -21.0252, -41.6543, 22.VIII.1982, fl., *H.C. de Lima 1773* (MBM, NY, VIES). Serra, APA Mestre Álvaro, -20.1285, -40.3078, 21.VII.2013, fr., *P.H.D. Barros et al. 209* (VIES). Venda Nova do Imigrante, Alto Bananal, -20.3397, -41.1347, 15.I.1995, fl., *G. Hatschbach et al. 61536* (ESA, MBM, NY, RB). Viana, Jucuruana, Fazenda Experimental Engº Regibaldo Conde/INCAPER, -20.3903, -40.4961, 25.06.2014, fr., *M. Ribeiro 1081* (VIES). Vitória, -20.3194, -40.3378, 25.III.1998, fl., *O.J. Pereira* (VIES 1630).

Inga capitata occurs in Costa Rica, northern South America to Guyana, and western South America, including Brazil to Bolivia (Pennington 1997). In Brazil, it is found in the Amazon and Atlantic Forests in the states of Acre (AC), Amazonas (AM), Amapá (AP), BA, ES, Maranhão (MA), MG, PA, PB, Pernambuco (PE), RJ, Rondônia (RO), Roraima (RR), Sergipe (SE), and SP (Pennington 1997; BFG 2018). In ES, the species occurs widely in the dense ombrophilous forest, open ombrophilous forest, seasonal semideciduous forest, and pioneer formations (Fig. 1), where it has been registered in slope forests, *tabuleiro* forests, and *restingas*.

In ES, *Inga capitata* has notable variation in the dimensions and consistency of its leaflets, flower size, density of the flowers in the inflorescence (congest or lax), and fruit size. However, this variation could not be related to its geographic distribution or ecological factors. This variation has been observed throughout the Atlantic Forest by Garcia (1998) and through the species' entire range (Pennington 1997). Even with such wide variation, *I. capitata* can be easily recognized by its glabrous or subglabrous branches, terete rachis, patelliform and usually sunken nectaries, inflorescences on spikes, and the presence of a nectariferous disk around the ovary. Collected with flowers in January and March to December and with fruits from January to April. Local name: *ingá-feijão*.

4. *Inga ciliata* C. Presl. subsp. ***ciliata***, Symb. Bot. 2(6): 11, pl. 58. 1834. Fig. 2p-u

Treelets 3–6 m tall; young branches hirsute, not exfoliating. Stipules 4–8 mm long, linear to lanceolate, caducous or persistent; petiole 0.9–2 cm long, winged, hirsute; rachis 3.5–15 cm long, winged; foliar nectaries stalked, rarely sessile, terete or capitate, circular; leaflets 4–11 pairs, 3.5–7 × 1–1.5 cm, elliptic to lanceolate, apex acute to attenuate, mucronate, base acute to obtuse, glabrous adaxially, glabrescent abaxially. Inflorescence axillary, solitary or fasciculate, raceme; peduncle 17–32 mm long, hirsute; floral rachis 15–20 mm long; bracts 3.5–6.7 mm long, linear, persistent. Flower pedicel 1.5–3.5 mm long; calyx open in bud, ca. 4.5 mm long, tubular, no striate, no inflated, hirsute; corolla 14.6–17.8 mm long, infundibuliform, sericeous; androecium with ca. 40 stamens, ca. 35 mm long, staminal tube exserted, ca. 13 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 8–10.5 × 2–2.3 cm, plane, margins narrow, straight, hirsute.

Selected specimens: Aracruz, estrada para Barra do Riacho, -19.8202, -40.2733, 13.III.2010, fl., *D.A. Folli 6571* (CVRD, VIC, VIES). Linhares, São Sebastião, -19.3911, -40.0722, 23.V.2003, fr., *V. Demuner 2317* (HUEFS, MBML, VIES). Marilândia, Alto Liberdade, -19.4127, -40.5416, 19.IV.2006, fr., *L.F.S. Magnago et al. 924* (MBML, VIES).

Inga ciliata subsp. *ciliata* occurs in Costa Rica, Panama, Peru, and Brazil, where its distribution covers the states of AM, BA, MG, PA, PE, and SE (Pennington 1997; BFG 2018). This study expands its distribution to ES, where it was collected in dense ombrophilous forest (Fig. 3), in slope forests and *tabuleiro* forests.

Inga ciliata is similar morphologically to *I. leptantha*. They differ, mainly, by the stipules and bracts that, in general, are longer and more densely hairy in *I. leptantha* (Pennington 1997).

All specimens of *I. ciliata* subsp. *ciliata* collected in ES were identified in herbaria as *I. aff. leptantha*, but they are distinguished by linear to lanceolate stipules of 4 to 8 mm in length, linear bracts, calyx with five filiform lobes, and 4 to 11 pairs of smaller leaflets (3.5–7 × 1–1.5 cm), characteristics also observed for the species by Pennington (1997) and Garcia (1998). *Inga leptantha* has lanceolate to ovate stipules of 5 to 15 mm in length, lanceolate to elliptical bracts, calyx with four acute lobes, and 2 to 6 pairs of larger leaflets (4.5–14.5 × 1–4 cm). Pennington (1997) recognized two subspecies for *Inga ciliata*: subsp. *subcapitata*, with sessile nectary, subcapitate inflorescence, ovate calyx lobes, symmetrical leaflet base, and subsp. *ciliata*. The studied specimens belong to subsp. *ciliata* since they usually exhibit stalked nectaries, narrow and subulate calyx lobes, and asymmetric base of the leaflets. Collected with flowers from March to December and with fruits from April to June and in December.

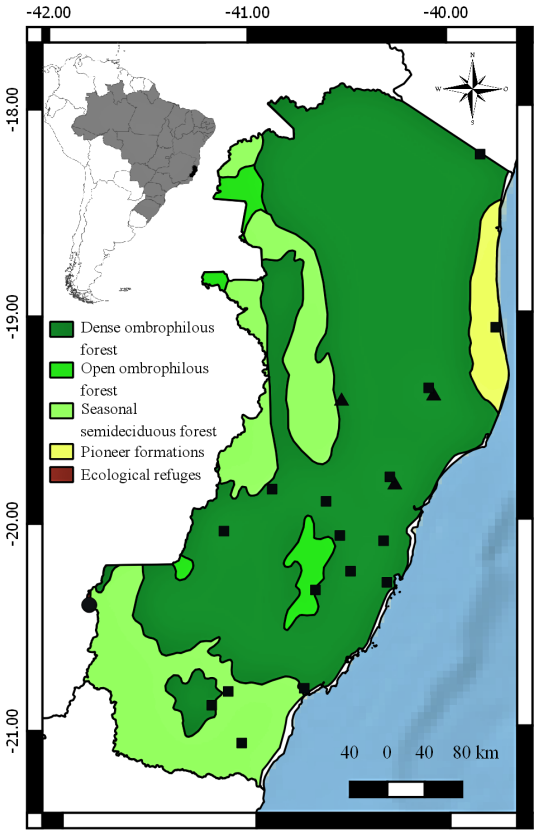

Figure 3 – Geographic distribution of *Inga* species in the state of Espírito Santo (black triangle = *I. ciliata*; black circle = *I. cylindrica*; black square = *I. edulis*).

5. *Inga cylindrica* (Vell.) Mart., Flora 20(2): Beibl. 114. 1837.

Trees ca. 12 m tall; young branches tomentose, not exfoliating. Stipules 9–10 mm long, ovate, caducous; petiole 1.2–2 cm long, terete, glabrous to tomentose; rachis 2.5–4.5 cm long, terete or narrowly marginate; foliar nectaries sessile, patelliform, circular; leaflets 3–4 pairs, 4–6.5 × 1.3–2.2 cm, elliptic or lanceolate, apex acute or acuminate, base acute, glabrous. Inflorescence axillary, solitary or fasciculate, a lax spike; peduncle 5–10 mm long, glabrous to tomentose; floral rachis 18–25 mm long; bracts 0.5–1 mm long, ovate, caducous. Flowers sessile; calyx open in bud, ca. 1 mm long, campanulate, no striate, no inflated, tomentose on the apex; corolla ca. 3 mm long, campanulate, tomentose on the apex; androecium with ca. 34 stamens, 10–12 mm long, staminal tube exserted, ca. 5 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 12–20 × 1.5–1.7 cm, constricted between the seeds, margins narrow, straight to curved, glabrous.

Selected specimens: Alto Caparaó, Bragança, estrada entre os municípios Alto Caparaó e Caparaó, -20.4333, -41.8683, 20.X.2012, fl., *T.B. Flores et al. 1304* (MBML, UEC, VIES).

Additional specimens: BRAZIL. MINAS GERAIS: Espera Feliz, Reserva Particular do Patrimônio Natural Bom Feliz, -20.6598, -41.8595, 28.I.2012, fr., *A.M. Moraes 216* (VIES).

Widely distributed from Central America to South America (Pennington 1997). In Brazil, *I. cylindrica* occurs in the Amazon and Atlantic Forests and the Cerrado, in the states of AC, AM, PA, Goiás (GO), Mato Grosso (MT), BA, MG, and RJ (BFG 2018; Garcia & Bonadeu 2020). This represents the first record of this species in ES, where it is found in ecological refuges (Fig. 3).

In ES, *Inga cylindrica* is similar morphologically to *I. laurina* due to the shape of the inflorescence and floral structure but differs in that *I. cylindrica* has a larger number of pairs of leaflets (3–4 *vs.* 2) but are smaller in size (4–6.5 × 1.3–2.2 cm *vs.* 4.4–11 × 2–4.6 cm), and the shape of the fruits, which are long and constricted between the seeds (Pennington 1997). Collected with flowers in October.

6. *Inga edulis* Mart., Flora 20(2): Beibl. 113-114. 1837. Fig. 4a-c

Trees 8–26 m tall; young branches tomentose, not exfoliating. Stipules 4–7 mm long, lanceolate

to linear, caducous; petiole 2–4 cm long, terete to winged, tomentose; rachis 3.3–20 cm long, winged; foliar nectaries sessile, cupuliform, transversely compressed; leaflets 3–5 pairs, 7.8–19 × 3–7.3 cm, elliptic, apex cuspidate, base obtuse to rounded, tomentose. Inflorescence axillary, solitary to fasciculate, spike; peduncle 10–40 mm long, tomentose; floral rachis 12–50 mm long; bracts 3.1–7.3 mm long, ovate to elliptic, caducous. Flowers sessile; calyx open in bud, 5–12.4 mm long, tubular, no striate, no inflated, sericeous; corolla 10.8–21.2 mm long, infundibuliform, sericeous; androecium with 58–80 stamens, 41–55.5 mm long, staminal tube exserted or included, 15–20 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 13–41 × 0.9–1.7 cm, cylindric, margins expanded, faces covered, sulcate longitudinally, straight, tomentose. **Selected specimens**: Afonso Cláudio, -20.0833, -41.1333, 26.XI.2015, fr., *W.C. Cardoso & W.S. Borges* 408 (VIES). Atílio Vivácqua, Sítio Vendinha, -20.9141, -41.1982, 22.IX.2002, fl., *H.M.R. Bolzan* (VIES 20050). Cachoeiro de Itapemirim, Bananal do Norte, -20.8488, -41.1128, 31.VII.1995, fr., *G. Acácio 201* (VIES). Cariacica, Reserva Biológica Duas Bocas, -20.2744, -40.4783, 23.VII.2008, fr., *C.N. Fraga & P.H. Labiak 2196* (MBML). Conceição da Barra, Reserva Biológica do Córrego Grande, -18.2625, -39.8050, 21.XII.2011, fl., *M. Ribeiro & A.O. Giaretta 733* (SAMES). Domingos Martins, Sítio Sr. Adolpho, -20.3633, -40.6591, 2.XII.1991, fl., *O.J. Pereira et al. 2945* (VIES). Itarana, Sítio Sarnaglia, -19.8738, -40.8753, 20.IV.2009, fl., *V.B. Sarnaglia Júnior 45* (VIES). Jaguaré, Barra Seca, -18.9055, -40.0760, 12.VI.1996, fl. and fr., *G. Hupp 37* (MBML). Linhares, Reserva Natural Vale, -19.3910, -40.0722, 24.IX.1986, fl., *D.A. Folli 613* (CVRD, VIES); -19.3910, -40.0722, 3.X.2007, fr., *D.A. Folli 5718* (CVRD, VIC, VIES). Piúma, -20.8583, -40.8181, 9.III.2017, fl., *A.A.V. Polese 03* (VIES). Presidente Kennedy, Praia das Neves, -21.0988, -41.0466, 15.IX.2009, fr., *J.M.L. Gomes & R.T. Valadares 3507* (VIES). Santa Leopoldina, Cachoeira do Mochafongo, -20.1143, -40.5317, 11.XII.2007, fl., *V.F. Mansano & A. Paviotti 449* (NY, RB). Santa Teresa, Estação Biológica de Santa Lúcia, -19.9763, -40.5280, 4.VII.2013, fr., *A.P. Fontana 7718* (RB). Serra, Mestre Álvaro, -20.1286, -40.3078, 16.I.2013, fl., *L.A. Silva et al. 330* (VIES). Vila Velha, Parque Natural Municipal de Jacarenema, -20.3297, -40.2924, 25.VII.2012, fl. and fr., *L.A. Silva et al. 233* (VIES).

Inga edulis is distributed throughout South America (Pennington 1997); in Brazil, it occurs in the Amazon and Atlantic Forests, the Caatinga, and the Cerrado domains in the states of AC, AM, AP, BA, ES, MG, MT, PA, PB, PE, PR, RJ, RO, RR, SC, and SP (BFG 2018). In ES, it is well represented in the dense ombrophilous forest, seasonal semideciduous forest, and pioneer formations (Fig. 3), in slope forests, *tabuleiro* forests, and *restingas*. In addition, the species is cultivated in gardens and yards. The occurrence in the *restinga* increases the distribution of the species in the Atlantic Forest formations of ES, as observed by Garcia (1998).

Inga edulis resembles *I. ingoides* for its long, cylindrical fruits with covered faces but differs in cupuliform and transversely compressed nectaries, while *I. ingoides* has patelliform and circular nectaries. Collected with flowers from January to June, August, September, and December and with fruits from June to November. Local names: *ingá-de-metro*, *ingá-macarrão*.

7. *Inga exfoliata* T.D. Penn. & F.C.P. Garcia, in T.D. Pennington, Gen. *Inga*, Bot. 245 (1997).

Fig. 4d-g

Trees 3–15 m tall; young branches glabrous or glabrescent, older exfoliating. Stipules 5–6.5 mm long, filiform, caducous; petiole 2.3–8 cm long, terete, glabrous; rachis 8.4–24 cm long, terete; foliar nectaries sessile, patelliform, circular; leaflets 2–5 pairs, 8–23 × 3–6.5 cm, elliptic to ovate, apex acute to acuminate, base cuneate to acute, glabrous. Inflorescence ramiflorous, axillary, solitary, umbellate; peduncle 40–110 mm long, glabrescent; floral rachis globose; bracts ca. 1.2 mm, lanceolate, caducous. Flower pedicel 1–3.5 mm long; calyx closed in bud, 1–1.5 mm long, tubular, no striate, no inflated, puberulent; corolla 6–15.5 mm long, campanulate, puberulent; androecium with ca. 32 stamens, 15.7–35.5 mm long, staminal tube exserted, 8.2–17.5 mm long filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 16.5–30 × 2–3 cm, plane, margins narrow, straight, glabrous.

Selected specimens: Alegre, Córrego Seco, -20.7636, -41.5331, 22.I.2008, fl., *L. Kollmann & C. Fraga 10400* (MBML, RB). Conceição da Barra, Parque Estadual de Itaúnas, -18.4205, -39.7191, 13.I.2012, fl., *A. Giaretta 1221* (SAMES). Linhares, Reserva Natural Vale, -19.3910, -40.0722, 13.XI.1993, fl., *G.L. Farias 646* (CVRD, VIC, VIES). Marilândia, Liberdade, -19.4127, -40.5416, 12.XII.2007, fl., *V. Demuner et al. 4778* (MBML, VIES). Santa Leopoldina, Fazenda Caioaba, -20.1005, -40.5297, 9.VIII.2006, fr., *L.F.S. Magnago et al. 1255* (MBML, VIES). Santa Maria de Jetibá, Belém, -20.0433, -40.6972, 27.II.2003, fl., *L.J.C. Kollmann & M.V.S. Berger 6009* (MBML). Santa Teresa, Estação Biológica de São Lourenço, 21.VIII.2001, -19.2472, -40.4552, fr., *L.J.C. Kollmann & E. Bausen 4385* (MBML). Vila Pavão, Barra da Rapadura, -18.6150,

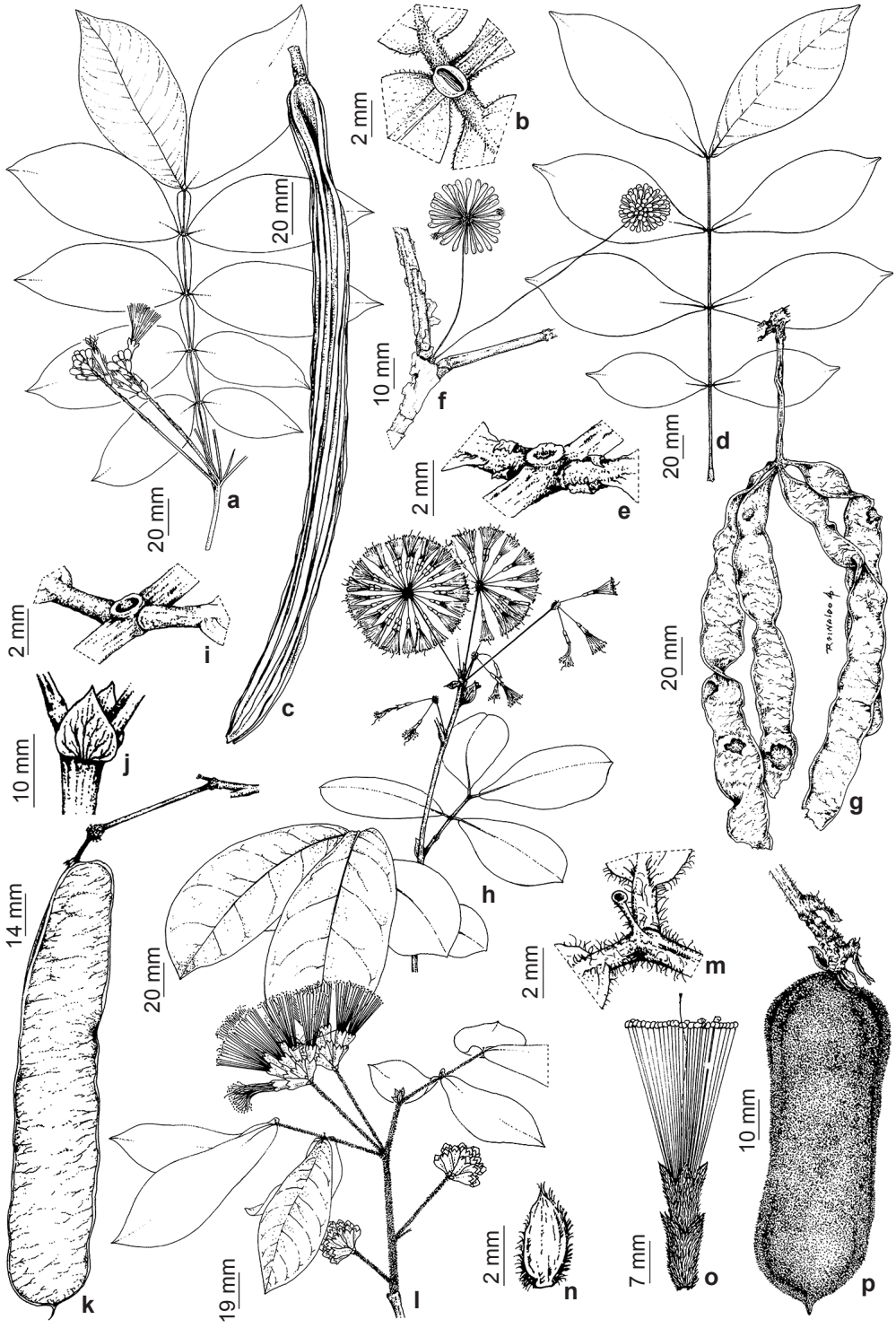

Figure 4 – a-c. *Inga edulis* – a. reproductive branch; b. foliar nectary; c. legume. d-g. *Inga exfoliata* – d. leaf; e. foliar nectary; f. inflorescences; g. legume. h-k. *Inga flagelliformis* – h. reproductive branch; i. foliar nectary; j. stipule; k. legume. l-p. *Inga hispida* – l. reproductive branch; m. foliar nectary; n. bract; o. flower; p. legume. (b. *V.B. Sarnaglia Júnior 45*; c. *J.M.L. Gomes & R.T. Valadares 3507*; e. *O.J. Pereira et al. 5218*; f. *G.L. Farias 646*; g. *F.C.P. Garcia et al. 699*; j. *F.C.P. Garcia 697*; k. *F.C.P. Garcia et al. 715*; o. *F.C.P. Garcia et al. 696*; p. *F.C.P. Garcia et al. 712*).

-40.6114, 16.II.2018, fl., *R.C. Forzza et al. 7862* (RB, VIES). Vila Velha, -20.3297, -40.2925, 5.IX.1983, fl. and fr., *B. Weinberg 558* (MBML, RB).

This species has only been recorded in the Atlantic Forest of the states of ES and MG (BFG 2018). In ES, it occurs in dense ombrophilous forest, open ombrophilous forest, and seasonal semideciduous forest (Fig. 5), occupying areas of slope forests, *tabuleiro* forests, and *restingas*. Records of the species in *restingas* increase its known occurrence in Atlantic Forest formations beyond those observed by Garcia (1998).

Inga exfoliata is easily recognized by having exfoliating branches, a characteristic referred to by its species name. In ES, it resembles *I. flagelliformis* due to its umbellate inflorescences but is differentiated by its calyx closed in bud and pedicels from 1 to 3.5 mm in length, while *I. flagelliformis* has non-exfoliating branches, a calyx open in the bud, and pedicels from 4.5 to 26 mm in length. Collected with flowers from January to April, August, September, and December and with fruits in January, February, from July to October, and December. Local name: *ingá-miúdo*.

8. *Inga flagelliformis* (Vell.) Mart., Flora 20(2): Beibl. 112-113. 1837. Fig. 4h-k

Trees 8–23 m tall; young branches glabrescent, no exfoliating. Stipules 8.2–17 mm long, ovate, persistent; petiole 1.8–3.8 cm long, terete, glabrous; rachis 3.8–7.2 cm long, terete, glabrous; foliar nectaries sessile, patelliform, circular; leaflets 2–3 pairs, 9.5–18 × 2.5–8 cm, elliptic, lanceolate or oblanceolate, apex acuminate to cuspidate, base acute to obtuse, glabrous. Inflorescence axillary, solitary or fasciculate, umbellate; peduncle 18–100 mm long, puberulent; floral rachis globose; bracts 1–2.5 mm long, spatulate, persistent. Flower pedicel 4.5–26 mm long; calyx open in bud, 1.5–5.5 mm long, tubular, no striate, no inflated, glabrescent, apex puberulent; corolla 6–10.3 mm long, tubular, glabrescent, apex puberulent; androecium with 35–50 stamens, 13.5–20.5 mm long, staminal tube included or exserted, 5–9.8 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 10–17 × 2.5–3.2 cm, plane, margins narrow, straight, glabrous.

Selected specimens: Águia Branca, propriedade do Sr. Voito, -18.9831, -40.7402, 22.XI.2007, fr., *V. Demuner et al. 4595* (VIES). Atílio Vivácqua, Serra das Torres, -21.3426, -41.2039, 25.IV.2007, fl., *A.P. Fontana et al. 3179* (MBML, VIES). Barra de São Francisco, Córrego do Engenho, -18.7549, -40.8908, 12.XII.2000, fr., *L.J.C. Kollmann et al. 3490* (MBML, VIES). Conceição da Barra, RPPN Sayonara, -18.4963, -39.9563, 27.IX.1998, fr., *A.M. Assis & L.F.D. Valentin 1786* (MBML, VIES). Linhares, Reserva Natural Vale, -19.3910, -40.0722, 13.XI.1993, fl., *F.C.P. Garcia 697* (RB, UEC, VIC). Marilândia, -19.4127, -40.5416, 19.VIII.2005, fl., *A.A. Luz 299* (CVRD, VIES). Montanha, Fazenda Lagoa Grande e Cavalo Grande, -18.1268, -40.3633, 29.IX.2007, fr., *J.M.L. Gomes 3109* (VIES). Santa Leopoldina, Colina Verde, -20.1077, -40.4422, 29.V.2007, fr., *V. Demuner 4055* (RB, VIES). Santa Teresa, Santo Antônio, -19.9356, -40.6002, 7.I.1999, fl., *L.J.C. Kollmann 1492* (RB, VIES).

Inga flagelliformis occurs in Brazil and Guyana (Pennington 1997; Garcia 1998). In Brazil, it is distributed in the Atlantic and Amazon Forests in the states of AC, AM, AP, BA, ES, MG, PA, and RJ (BFG 2018). In ES, its occurrence has been recorded in dense ombrophilous forest, seasonal semideciduous forest, and pioneer formations (Fig. 5) in areas of slope forests and *tabuleiro* forests.

The diagnostic characters of *I. flagelliformis* were discussed in the comments on *I. exfoliata*. Collected with flowers in April and from August to November and with fruits in June and from September to December. Local name: *ingá-pau*.

9. *Inga hispida* Schott *ex* Benth, Trans. Linn. Soc. London 30(3): 625. 1875. Fig. 4l-p

Trees 3–9 m tall; young branches hispid, no exfoliating. Stipules 5–14.5 mm long, lanceolate to spatulate, caducous; petiole 2–7.2 cm long, terete, hispid; rachis 2–14 cm long, terete; foliar nectaries stalked, terete or capitate, circular; leaflets 2–3(–4) pairs, 8.2–26 × 3.7–10 cm, elliptic to obovate, apex obtuse, acute or cuspidate, base cuneate, glabrous to glabrescent adaxially, glabrescent to hispid abaxially. Inflorescence axillary, solitary or fasciculate, a congested spike or raceme; peduncle 18–80 mm long, hispid; floral rachis 15–32 mm long; bracts 3.5–5.6 mm long, cucullate, caducous. Flowers sessile to pedicellate; pedicel until 3.5 mm long; calyx open in bud, 6–18 mm long, tubular to infundibuliform, no striate, no inflated, sericeous; corolla 8.6–23 mm long, infundibuliform, sericeous; androecium with 45–156 stamens, 25–51 mm long, staminal tube included to exserted, 9.2–29 mm long, filaments whitish; nectary disk absent; gynoecium 1–2 carpels; ovary glabrous. Legume nucoid 7.3–15.5 × 2.3–3.3 cm, plane to convex, margins narrow, straight, hispid.

Selected specimens: Anchieta, lagoa de Mãe-Bá, -20.8057, -40.6455, 4.I.2011, fr., *J.M.L. Gomes 4324* (VIES). Aracruz, Jacupemba, -19.8202, -40.2733,

5.I.2008, fl., *A.A. da Luz 479* (CVRD, VIES). Cachoeiro de Itapemirim, Bananal do Norte, -20.8488, -41.1128, 1.I.2013, fl., *G. Acácio 219* (VIES). Castelo, próximo ao Parque Estadual do Forno Grande, -20.6035, -41.1847, 18.IV.2009, fl., *J.M.L. Gomes 3268* (VIES). Conceição da Barra, Floresta Nacional do Rio Preto, -18.3858, -39.8461, 20.XI.2010, fl., *T.L. Rocha 69* (SAMES). Domingos Martins, margem do Rio Jucu, -20.3633, -40.6591, 17.I.2001, fr., *O.J. Pereira & E. Espindula 6747* (VIES). Governador Lindenberg, Pedra de Santa Luzia, -19.2758, -40.4633, 23.VIII.2006, fr., *V. Demuner 2701* (MBML, RB). Linhares, Reserva Natural Vale, -19.3910, -40.0722, 13.XI.1993, fl., *F.C.P. Garcia et al. 696* (RB, SPSF, UEC). Pinheiros, Reserva Biológica de Córrego do Veado, -18.3703, -40.2132, 1.XI.2010, fl., *M. Ribeiro et al. 341* (SAMES, VIES). Santa Leopoldina, Cabeceiras do Rio Novo, -20.1006, -40.5297, 7.XI.1989, fl., *G. Martinelli et al. 11866* (MBML, VIES). Santa Maria de Jetibá, Rio das Pedras, -20.0691, -40.7255, 20.I.2003, fr., *L.J.C. Kollmann et al. 5942* (MBML, VIES). Santa Teresa, Estação Biológica de Santa Lúcia, -19.9356, -40.6002, 8.II.2011, fr., *L.J.C. Kollmann et al. 12220* (MBML, VIES). São Domingos do Norte, Sabiá, -19.0977, -40.5945, 2.V.2008, fr., *A.M. Assis & K.F.O. Faria 1597* (MBML). São Roque do Canaã, Alto Misterioso, -19.8033, -40.7725, 6.II.2011, fr., *L.J.C. Kollmann et al. 12168* (MBML, VIES). Serra, APA Mestre Álvaro, -20.1694, -40.3113, 16.I.2014, fl., *A.D. Firmino et al. 16* (VIES). Sooretama, -19.1420, -40.0828, 8.III.2018, fr., *G.S. Siqueira 1265 (*CVRD).

Restricted to Brazil, *I. hispida* is distributed in the states of BA, ES, and MG, in the Atlantic Forest domain (BFG 2018). In ES, it is well represented, with occurrence records in dense ombrophilous forest, seasonal semideciduous forest, and pioneer formations (Fig. 5) in areas of slope forests, *tabuleiro* forests, and *restingas*. This study represents the first record of the species in *restingas*.

Inga hispida differs from the other species found in ES due to having hispid young branches, ferrugineous, rachis terete, stalked foliar nectaries, and 2-carpellate gynoecium. Collected with flowers in January, April, May, and from September to November and with fruits from January to May, July, and October.

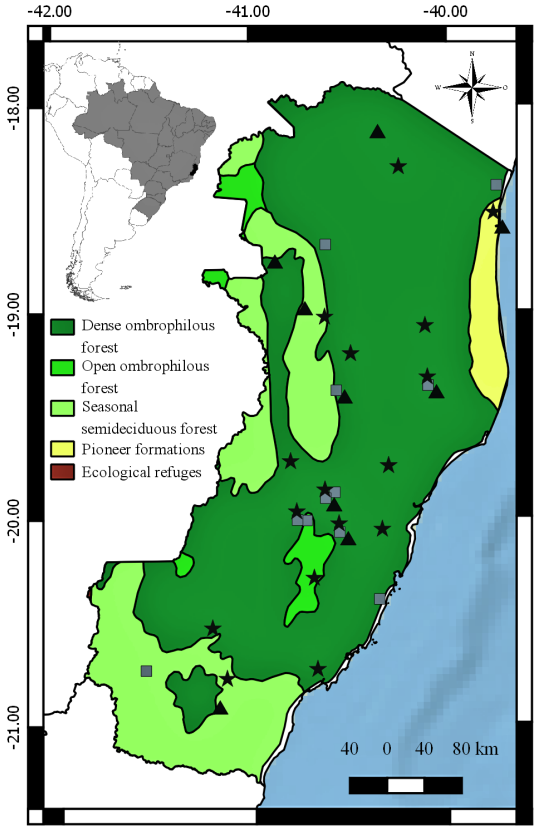

Figure 5 – Geographic distribution of *Inga* species in the state of Espírito Santo (grey square = *I. exfoliata*; black triangle = *I. flagelliformis*; black star = *I. hispida*).

10. *Inga ingoides* (Rich.) Willd., Sp. Pl. 4(2): 1012. 1806. Fig. 6a-d

Trees 4–5 m tall; young branches tomentose, not exfoliating. Stipules 3–5 mm long, oblong, caducous; petiole 0.9–2.4 cm long, terete to marginate, tomentose; rachis 4.45–8.3 cm long, winged; foliar nectaries sessile to subssessile, patelliform, circular to triangular; leaflets 4–5 pairs, 7–12 × 3–5.6 cm, elliptic to obovate, apex obtuse, acuminate to mucronate, base obtuse to oblique, pubescent adaxially, villous abaxially. Inflorescence axillary, solitary or fasciculate, raceme; peduncle 20–35 mm long, tomentose; floral rachis 15–32 mm long; bracts 2–3 mm long, ovate, caducous. Flowers sessile to subsessile; calyx closed in bud, 7–12 mm long, campanulate to tubular, no striate, no inflated, tomentose; corolla 15–20 mm long, campanulate, sericeous; androecium with ca. 50 stamens, 50–70 mm long, staminal tube exserted to included, 14–18 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid young 13–16 × 0.7–1.5 cm, cylindric, margins expanded, faces covered, straight to falcate, tomentose.

Selected specimens: Alegre, São João do Norte, -20.7635, -41.5331, 30.IX.2010, fl., *D.R. Couto 1651* (VIES). Colatina, Rio Pancas, -19.9361, -40.6167, 28.I.1997, fl., *M.M. Arbo 7770* (CEPEC, MOBOT). Montanha, Roda D'Água, -18.1268, -40.3633, 6.XI.1997, fr., *O.J. Pereira & R. de Almeida 6015* (VIES).

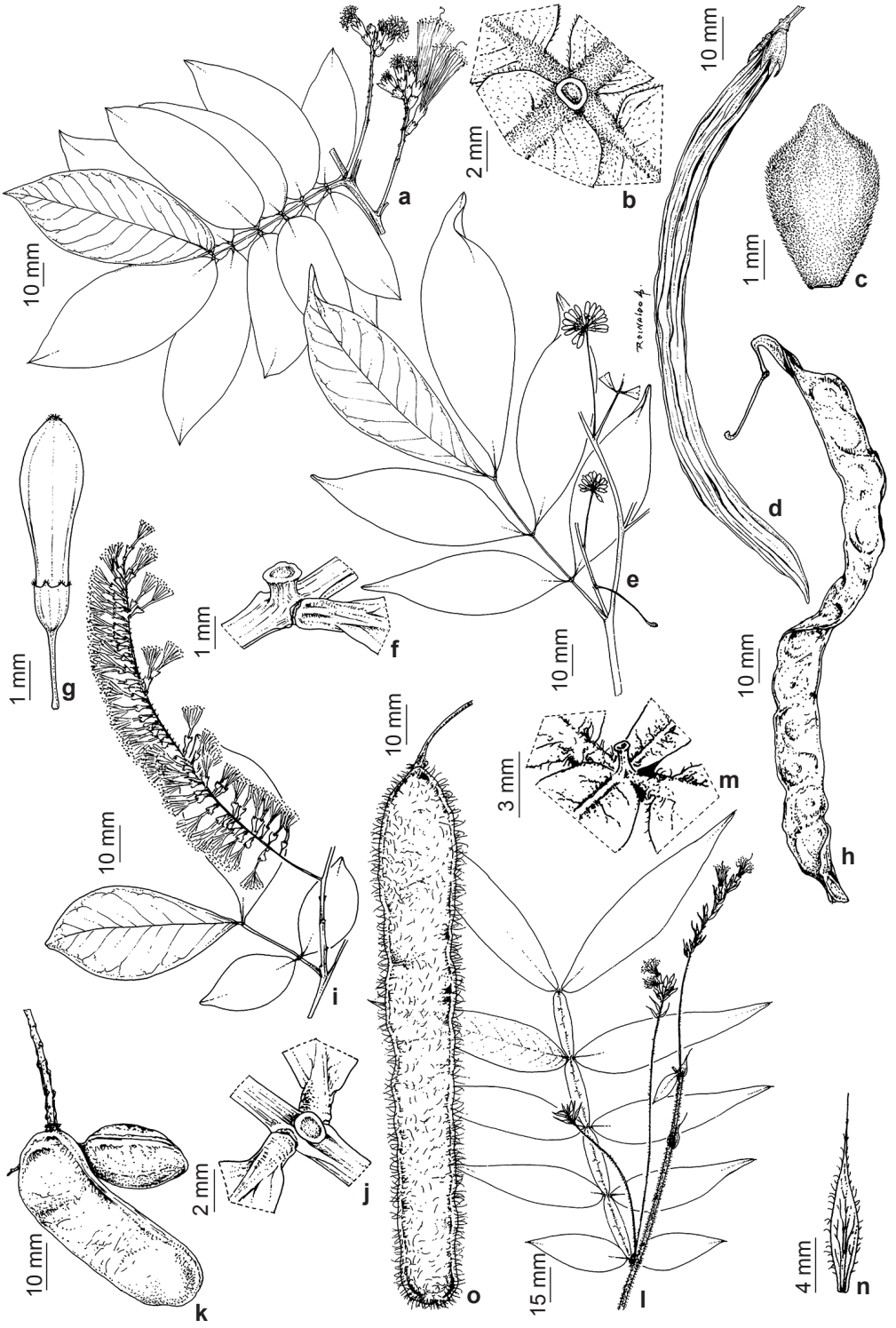

Figure 6 – a-d. *Inga ingoides* – a. reproductive branch; b. foliar nectary; c. floral bud; d. legume. e-h. *Inga lanceifolia* – e. reproductive branch; f. foliar nectary; g. floral bud; h. legume. i-k. *Inga laurina* – i. reproductive branch; j. foliar nectary; k. legume. l-o. *Inga leptantha* – l. reproductive branch; m. foliar nectary; n. bract; o. legume. (c. *D.R. Couto 1658*; d. *O.J. Pereira & R. de Almeida 6015*; g. *D.A. Folli 3324*; h. *D.A. Folli 2689*; j. *D.A. Folli 3608*; k. *V. de Souza 276*; n. *W.W. Thomas et al. 6072*; o. *W. Boone 65*).

Inga ingoides occurs in South America and the Lesser Antilles. In Brazil, it is distributed in the Amazon and Atlantic Forests and the Cerrado in the states of AC, AM, BA, Ceará (CE), ES, GO, MA, MG, MT, PA, PB, PE, Piauí (PI), RR, SP, and Distrito Federal (DF) (Pennington 1997; BFG 2018). In ES, its occurrence has been recorded in a few locations in dense ombrophilous forest and seasonal semideciduous forest (Fig. 7) in areas of slope forests. These records expand the occurrence observed by Garcia (1998) for *I. ingoides* in the Atlantic Forest, which was restricted to the alluvial and lowland dense ombrophilous forests.

Inga ingoides can be mistaken for *I. vera* subsp. *affinis* due to its vegetative aspect, but it is distinguished by its rounded flower buds and fruits with covered faces, while *I. vera* subsp. *affinis* has oblong flower buds and fruits with open faces. Collected with flowers in January and September and with fruits in July and November.

11. *Inga lanceifolia* Benth., Trans. Linn. Soc. London 30: 606. 1875. Fig. 6e-h

Trees ca. 10 m tall; young branches glabrescent, no exfoliating. Stipules 2–4 mm long, oblong, caducous; petiole ca. 2.33 cm long, terete to marginate, glabrous; rachis ca. 3.67 cm long, terete to marginate; foliar nectaries sessile to shortly stalked, cupuliform, circular; leaflets 2–3 pairs, ca. 11 × 3.5 cm, elliptic, apex acuminate, base cuneate to acute, glabrous. Inflorescence axillary, solitary, capitate; peduncle ca. 38 mm long, glabrous; floral rachis globose, ca. 2 mm long; bracts ca. 1 mm long, spatulate, caducous. Flower pedicel ca. 2 mm long; calyx open in bud, 1–1.2 mm long, campanulate, no striate, no inflated, glabrous; corolla 5–6 mm long, infundibuliform, glabrous; androecium with 28–40 stamens, 14–17 mm long, staminal tube exserted, ca. 8 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 15–17 × 0.8–1 cm, constricted between the seeds, margins narrow, straight to falcate, glabrous.

Selected specimens: Linhares, Reserva Natural Vale, -19.3910, -40.0722, 29.XII.1998, fl., *D.A. Folli 3324* (VIES, VIC). São Mateus, bairro Litorâneo, -18.7161, -39.8589, 28.VIII.2008, fl., *M.M. Monteiro et al. 55* (SAMES).

Restricted to Brazil, *I. lanceifolia* occurs in the states of ES, RJ, and SP, in the Atlantic Forest domain (BFG 2018). In ES, it is known to occur in dense ombrophilous forest (Fig. 7), occupying areas of *tabuleiro* forest, *mussunungas* (an Atlantic Forest domain with savanna vegetation on sandy soil), and *restingas* forests. Garcia (1998) observed that this species was relatively uncommon in the understory of dense ombrophilous forests in the states of RJ and SP.

Inga lanceifolia is morphologically similar to *I. exfoliata* and *I. flagelliformis* due to its globose floral rachis but differs in having a more attenuated leaflet base and constricted fruits between the seeds. Collected with flowers in July, August, and December and with fruits in February and July.

12. *Inga laurina* (Sw.) Willd., Sp. Pl. 4(2): 1018. 1806. Fig. 6i-k

Trees 5–11 m tall; young branches glabrescent, no exfoliating. Stipules 4.8–7 mm long, lanceolate, persistent; petiole 4.5–16.2 cm long, marginate, glabrous to glabrescent; rachis 7.5–55.6 cm long, marginate; foliar nectaries sessile, patelliform, circular; leaflets 2(–3) pairs, 4.4–11 × 2–4.6 cm, elliptic to obovate, apex acute to obtuse, base acute to obtuse, glabrous. Inflorescence axillary, solitary or fasciculate, a lax spike; peduncle 5–26 mm long, puberulent; floral rachis 30–80 mm long; bracts ca. 0.5 mm long, spatulate, caducous. Flowers sessile to subsessile; calyx open in bud, 1.5–2.3 mm long, campanulate, no striate, no inflated, puberulent; corolla 3.5–5.5 mm long, infundibuliform, glabrescent, lobes sericeous; androecium with 28–40 stamens, 14.5–17.3 mm long, staminal tube exserted, 7.7–10 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 2.3–7.7 × 1.3–2 cm, subcylindric, margins narrow, straight to slightly falcate, glabrescent.

Selected specimens: Anchieta, Rio Salinas, -20.8057, -40.6455, 3.XII.1997, fl., *A.M. Assis et al. 308* (VIES). Aracruz, Barra do Riacho, -19.8202, -40.2733, 30.V.2011, fr., *R.R. Vervloet & J. Silva 3568* (MBML). Baixo Guandu, estrada Ibituba à Alto Lage, -19.5188, -41.0158, 4.VI.2002, fl., *A.A. Luz da 62* (CVRD, VIES). Conceição da Barra, Pontal do Sul, Barra Grande, -18.5932, -39.7322, 6.VI.2007, fl., *J. Iganci et al. 253* (VIES). Domingos Martins, -40.6592, -20.3633, 11.I.2001, fl. and fr., *O.J. Pereira & E. Espindula 6737* (VIES). Guarapari, Parque Estadual Paulo César Vinha, -20.6580, -40.5110, 5.XII.1994, fl., *M. Simonelli 137* (VIES). Iúna, Serra do Valentim, -20.3458, -41.5358, VIII.2011, fl., *J.P.F. Zorzanelli & D.S. Senna 504* (VIES). Linhares, Reserva Biológica do Projeto TAMAR, -19.3910, -40.0722, 23.XII,1991, fr., *V. de Souza 276* (CVRD, VIC, VIES). Marataízes, -21.0433, -40.8244, 2.XI.1972, fl., *P.L. Krieger 11849* (RB). Santa Teresa, Parque do MBML, -19.9356, -40.6002, 25.IV.2003,

fr., *V. Demuner 1587* (HUEFS, MBML, VIES). São Mateus, Ilha de Guriri, -18.7161, -39.8588, 3.I.1997, fl., *N.M. Andrade 100* (VIES). Serra, Jacaraípe, -20.1285, -40.3078, 1.I.1996, fl., *A.R. Azevedo & F. Passamani 130* (VIES). Viana, -20.3903, -40.4961, 10.I.2001, fl., *O.J. Pereira & E. Espindula 6720* (VIES). Vila Velha, Morro do Moreno, -20.3264, -40.2772, 9.VIII.2009, fr., *V.B. Sarnaglia Júnior & R.T. Valadares 83* (VIES). Vitória, Parque Estadual da Fonte Grande, -20.3073, -40.3420, 1.I.2004, fl. and fr., *G.N. Martins 103* (VIES).

Inga laurina has a Neotropical distribution, occurring in Mexico, Central America, and South America (Pennington 1997). In Brazil, it occurs in the Amazon and Atlantic Forest, as well as the Caatinga and Cerrado domain, in almost all states: AC, AM, BA, CE, ES, GO, MA, MG, Mato Grosso do Sul (MS), MT, PA, PB, PE, PR, RJ, SP, and DF (Garcia 1998; BFG 2018). In ES, the species is widely distributed in areas of pioneer formations (*restingas*) and especially in the dense ombrophilous forest, with occurrence records in slope forests and *tabuleiro* forests (Fig. 7).

Inga laurina is morphologically similar to *I. marginata* due to its marginate leaf rachis and elongated spiciform inflorescences, with a smaller peduncle than the leaf rachis, but differs in having shorter fruits and cylindrical rachis, whereas *I. marginata* has a winged or marginate rachis. Collected with flowers and fruits throughout the year. Local name: *ingá-da-praia*.

13. *Inga leptantha* Benth., London J. Bot. 4: 603. 1845. Fig.6l-o

Trees 2–8 m tall; young branches hirsute, no exfoliating. Stipules 5–15 mm long, lanceolate to ovate, persistent; petiole 0.6–1.5 cm long, marginate or winged, hirsute; rachis 1.2–13.5 cm long, winged; foliar nectaries stalked, cylindric, circular; leaflets (1–)2–6 pairs, 4.5–14.5 × 1–4 cm, elliptic or lanceolate, apex attenuate, base obtuse, glabrous to glabrescent adaxially, hirsute abaxially, midrib hispid. Inflorescence axillary, solitary or fasciculate, spike; peduncle 20–73 mm long, hirsute; floral rachis 4–16 mm long; bracts 3.6–8.7 mm long, lanceolate to elliptic, persistent. Flowers sessile; calyx open in bud, 3.2–5.7 mm long, tubular to infundibuliform, no striate, no inflated, hirsute; corolla 11–17 mm long, infundibuliform, hirsute; androecium with 28–52 stamens, 36.5–45 mm long, staminal tube included to exserted, 13.5–17.5 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 5.2–15 × 1.5–2.2 cm, plane, margins narrow, straight, hirsute.

Selected specimens: Castelo, Fazenda Forno Grande, -20.6035, -41.1847, 28.I.2004, fl., *L.J.C. Kollmann 6417* (HUEFS, MBML, VIES). Colatina, São Salvador, -19.3970, -40.7148, 22.VII.2008, fl. and fr., *A.M. Assis 1767* (MBML). Governador Lindenberg, Pedra de Santa Luzia, -19.2758, -40.4633, 23.VIII.2006, fr., *V. Demuner 2734* (MBML). Linhares, Reserva Natural Vale, -19.3910, -40.0722, 18.III.2008, fl., *D.A. Folli 5971* (CVRD, VIC, VIES). Marilândia, Alto Liberdade, -19.3536, -40.5169, 19.IV.2006, fr., *L.F.S. Magnago et al. 924* (MBML). Pancas, Serra do Alto Mutum Preto, -19.2250, -40.8514, 14.IV.2013, fr., *H.C. de Lima 7644* (RB). Santa Leopoldina, Bragança, Rancho Chapadão, -20.1230, -40.5463, 30.III.2006, fr., *V. Demuner 2155* (MBML, VIES). Santa Maria de Jetibá, Belém, -20.0433, -40.6972, 21.V.2003, fr., *L.J.C. Kollmann 6186* (MBML). Santa Teresa, Vargem Alta, -19.9155, -40.6500, 25.IV.1984, fr., *W. Boone 65* (CEPEC, MBML, RB). São Roque do Canaã, Alto Misterioso, -19.8033, -40.7725, 6.II.2011, fl., *L.J.C. Kollmann et al. 12170* (MBML, VIES). Vargem Alta, -20.6913, -40.9638, 4.II.2015, fl., *D.T. Iglesias et al.* (VIES 36161).

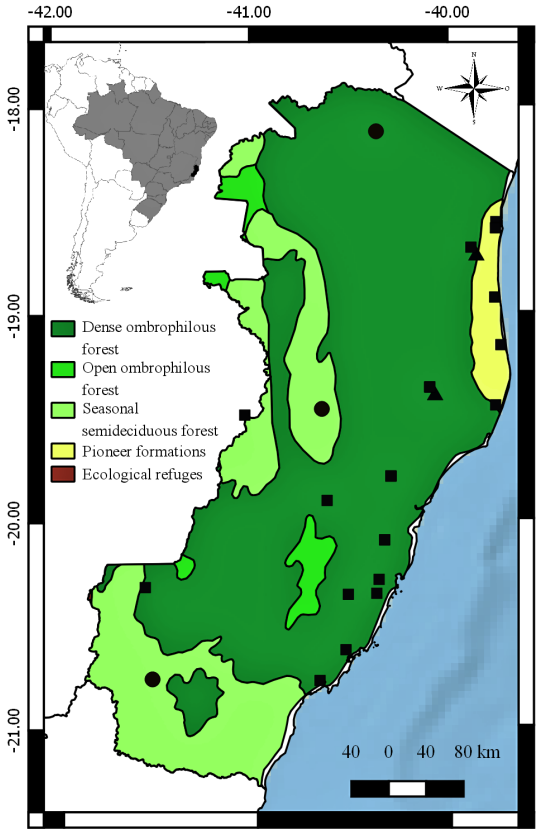

Figure 7 – Geographic distribution of *Inga* species in the state of Espírito Santo (black circle = *I. ingoides*; black triangle = *I. lanceifolia*; black square = *I. laurina*).

Restricted to Brazil, *I. leptantha* occurs in the Atlantic Forest domain in the states of BA, ES, MG, and RJ (BFG 2018). In ES, it is found in the dense ombrophilous forest, open ombrophilous forest, and seasonal semideciduous forest (Fig. 8) mainly in the slope forest, and in the *tabuleiro* forest. These records expand the occurrence observations by Garcia (1998) for the Atlantic Forest, which cited the low frequency of the species in the understory of the dense ombrophilous forest.

Inga leptantha is similar morphologically to *I. ciliata*. To distinguish these taxa, see the comments under *I. ciliata*. Collected with flowers from January to April and July and with fruits from May to September.

14. *Inga marginata* Willd., Sp. Pl. 4(2):1015. 1806. Fig. 9a-c

Trees 5–15 m tall; young branches pubescent to tomentose, no exfoliating. Stipules 2.2–2.6 mm long, elliptic, caducous; petiole 0.7–2.2 cm long, marginate, pubescent; rachis 1.5–4 cm long, winged; foliar nectaries subsessile, patelliform, circular; leaflets 2 pairs, 7.2–17 × 2.5–5 cm, elliptic, apex acuminate, base acute, glabrous. Inflorescence axillary, solitary, spike; peduncle 2–25 mm long, puberulent; floral rachis 20–100 mm long; bracts 0.7–1.5 mm long, spatulate, persistent. Flowers sessile; calyx open in bud, 1–1.8 mm long, campanulate, no striate, no inflated, puberulent; corolla 4.2–5.3 mm long, campanulate to infundibuliform, glabrous to puberulent on the apex; androecium with 32–48 stamens, 12.7–15.5 mm long, staminal tube exserted, 6–7.8 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 7.5–11 × 1.3–1.7 cm, subcylindric, margins narrow, straight, glabrescent.

Selected specimens: Cachoeiro de Itapemirim, Bananal do Norte, -20.8488, -41.1128, 17.VIII.1995, fl., *G. Acácio 205* (VIES). Cariacica, Reserva Biológica de Duas Bocas, -20.2913, -40.5194, 4.V.2008, fl., *A.M.A. Amorim 7331* (RB). Castelo, Parque Estadual do Forno Grande, -20.5161, -41.0836, 14.X.2008, fl., *R.C. Forzza et al. 5311* (HUEFS, MBML, RB, VIES). Domingos Martins, Comunidade Cristo Rei, -20.3633, -40.6591, 7.II.2001, fr., *O.J. Pereira & E. Espindula 6844* (VIC, VIES). Dores do Rio Preto, estrada entre a entrada do Parque Nacional do Caparaó e o centro do município de Pedra Menina, -20.6888, -41.8452, 21.X.2012, fl., *T.B. Flores et al. 1377* (VIES). Governador Lindenberg, -19.2667, -40.4833, 2.VIII.2005, fl., *A.A. da Luz 294* (CVRD, VIC, VIES). Guaçuí, Floresta do Rosal, -20.7756, -41.6794, IV.2012, *C. Lage & K.C. Castro 101* (VIES). Ibitirama, Pedra Roxa, -20.5414, -41.6671, 28.XI.2009, fl., *D.R. Couto et al. 1368* (VIES). Iúna, Serra do Valentim, -20.3458, -41.5358, 23.IV.2011, fl., *J.P.F. Zorzanelli 06* (VIES). Linhares, São Rafael, -19.3910, -40.0722, 9.IX.1991, fl., *V. de Souza 184* (CVRD, VIES). Marilândia, Liberdade, -19.4127, -40.5417, 10.XII.2007, fl., *V. Demuner 4714* (MBML, VIES); fr., *V. Demuner 4716* (MBML, VIES). Mimoso do Sul, Conceição de Muqui, -21.0642, -41.3664, 9.IX.1977, fl., *R.S. Ramalho 990* (RB, VIES). Santa Maria de Jetibá, Belém, -20.0433, -40.6972, 19.11.2002, fl., *L.J.C. Kollmann 5779* (RB). Santa Teresa, Reserva Biológica Augusto Ruschi, -19.9356, -40.6003, 7.V.2003, fl., *R.R. Vervloet & W. Pizziolo 2370* (MBML, VIES). Serra, Morro do Mestre Álvaro, -20.1821, -40.3209, 10.III.2010, fl., *D.A. Folli 6572* (CVRD, VIC, VIES). Venda Nova do Imigrante, Sítio Guaçuvirá, -20.3397, -41.1347, 30.I.1995, fr., *D.A. Folli 2503* (CVRD, VIC, VIES).

Inga marginata is a very common species and is among the most widely distributed of the genus, occurring from southern Mexico to extreme southern Brazil and northern Argentina

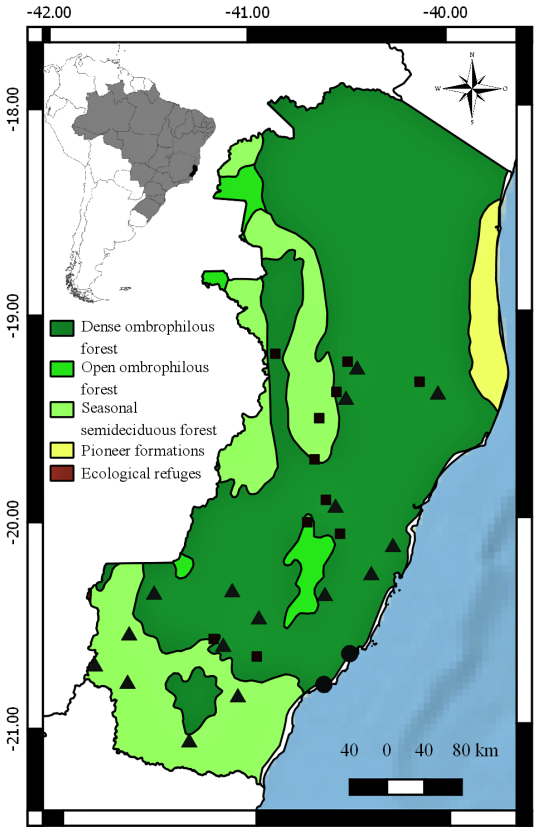

Figure 8 – Geographic distribution of *Inga* species in the state of Espírito Santo (black square = *I. leptantha*; black triangle = *I. marginata*; black circle = *I. maritima*).

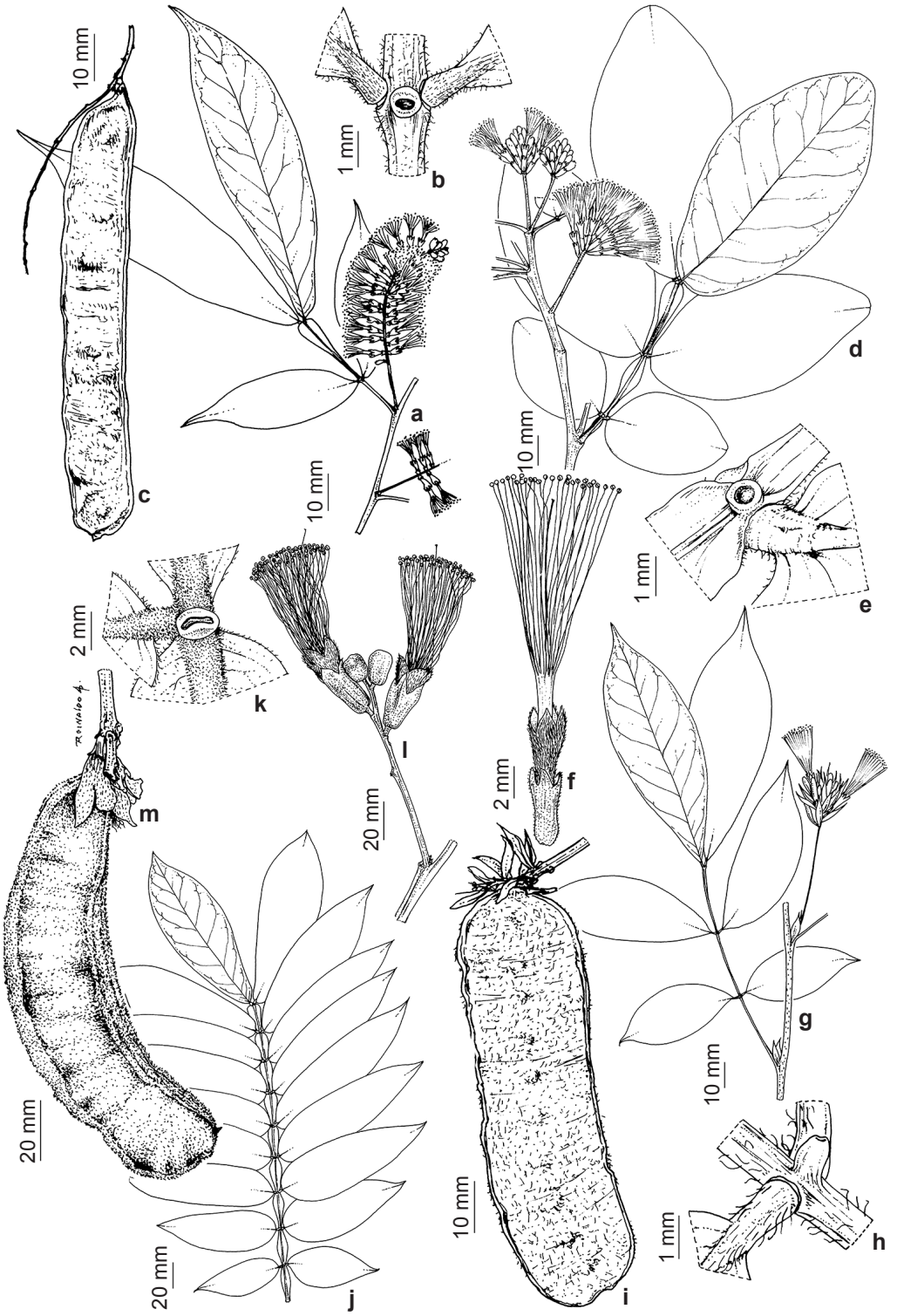

Figure 9 – a-c. *Inga marginata* – a. reproductive branch; b. foliar nectary; c. legume. d-f. *Inga maritima* – d. reproductive branch; e. foliar nectary; f. flower. g-i. *Inga platyptera* – g. reproductive branch; h. foliar nectary; i. legume. j-m. *Inga sessilis* – j. leaf; k. foliar nectary; l. inflorescence; m. legume. (b. *R.C. Forzza et al. 5311*; c. *O.J. Pereira & E. Espindula 6844*; f. *J.M.L. Gomes 3441*; h. *L.J.C. Kollmann et al. 5836*; i. *J.P.F. Zorzanelli 405*; l. *J.M.L. Gomes 2894*; m. *T.S. Lorencini et al. 272*).

(Pennington 1997). In Brazil, it occurs in the Amazon and Atlantic Forests and the Cerrado, in the states of AC, AM, AP, BA, CE, ES, GO, MG, MS, MT, PA, PB, PR, RJ, RO, Rio Grande do Sul (RS), Santa Catarina (SC), SP, and DF (BFG 2018). In ES, it is found widely in areas of dense ombrophilous forest and seasonal semideciduous forest (Fig. 8).

The diagnostic characters of *I. marginata* are discussed in the comments on *I. laurina* above. Collected with flowers from August to June and with fruits in January, April, May, June, and December. Local name: *ingá-ervilha*.

15. *Inga maritima* Benth., London J. Bot. 4: 601. (1845). Fig. 9d-f

Shrubs ca. 2 m tall; young branches villous, no exfoliating. Stipules not observed; petiole 0.8–1.3 cm long, terete to marginate, villous; rachis 1.8–5.4 cm long, winged; foliar nectaries sessile, patelliform; leaflets 2–3 pairs, 5.4–12 × 2.7–8 cm, elliptic, ovate to obovate, apex acute, base obtuse or rounded, glabrescent adaxially, tomentose abaxially. Inflorescence axillary, solitary or fasciculate, a congested spike; peduncle 10–25 mm long, villous; floral rachis 7–20 mm long; bracts 1–2 mm long, ovate, caducous. Flowers sessile; calyx open in bud, 4.3–5 mm long, infundibuliform or tubular, no striate, no inflated, tomentose; corolla 9–10 mm long, infundibuliform, sericeous; androecium with ca. 30 stamens, 25–30 mm long, staminal tube exserted, ca. 11 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 9–13 × 1.7–1.9 cm, subcylindric, margins narrow, straight to slightly curved, glabrescent.

Selected specimens: Anchieta, Praia da Guanabara, -20.8057, -40.6455, 6.X.2007, fl., *J.M.L. Gomes 3441* (VIC, VIES). Guarapari, Ubu, -20.6580, -40.5110, 29.VI.1991, fl., *C.N. de Fraga 459* (RB).

Additional specimens: BRAZIL. RIO DE JANEIRO: Rio de Janeiro, Parque Natural Municipal de Grumari, -22.9028, -43.2075, 5.II.2018, fr., *L.O.L. Pedereira et al. 15* (RB).

Inga maritima is endemic to the *restingas* of RJ and ES (Garcia 1998; Dutra *et al.* 2015; BFG 2018). In ES, it is restricted to *restingas* in the south of the state (Fig. 8). Its threat level puts it in the VU category due to the severe fragmentation of restingas from property speculation (Martinelli *et al.* 2013), and it is on the List of Threatened Fauna and Flora in the state of ES (Fraga *et al.* 2019), where it is considered endangered, due to its restricted occurrence in a small portion of the coast with constant anthropic threats.

Among the species of *Inga* in ES, *I. maritima* is distinct due to its tomentose indumentum, winged rachis, calyx with irregular lobes, and congested spiciform inflorescences. Collected with flowers in June and October. Local name: *ingá-da-restinga*.

16. *Inga platyptera* Benth., London J. Bot. 4: 602. 1845. Fig. 9g-i

Trees 6–25 m tall; young branches hirsute, no exfoliating. Stipules 5.5–13.5 mm long, elliptic to lanceolate, persistent; petiole 0.7–1.3 cm long, terete to winged, sparsely hirsute; rachis 1.4–5.5 cm long, terete to winged; foliar nectaries stalked, cupuliform or cyathiform, circular; leaflets (1–)2–3 pairs, 9–14 × 3.2–5.3 cm, elliptic to lanceolate, apex acuminate to cuspidate, base acute to obtuse, glabrescent adaxially, sparsely hirsute abaxially. Inflorescence axillary, solitary, a congested spike; peduncle 34–50 mm long, sparsely hirsute; floral rachis 5–25 mm long; bracts 13–17 mm long, lanceolate to ovate, persistent. Flowers sessile; calyx closed in bud, 7.5–9 mm long, tubular, no striate, no inflated, sericeous; corolla 13.5–19.3 mm long, infundibuliform, sericeous; androecium with 55–60 stamens, 35–45 mm long, staminal tube included 12–16 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid ca. 9 × 2.5 cm, plane, margins narrow, straight, hirsute.

Selected specimens: Iúna, Serra do Valentim, -20.3458, -41.5358, 23.VI.2013, fr., *J.P.F. Zorzanelli 405* (VIES). Santa Maria de Jetibá, Rio das Pedras, -20.0691, -40.7255, 10.XII.2002, fl., *L.J.C. Kollmann 5836* (MBML, VIES). Santa Teresa, Reserva Biológica Augusto Ruschi, -19.9075, -40.5530, 21.V.2003, fl., *R.R. Vervloet & W. Pizziolo 2453* (MBML, VIES).

Restricted to Brazil, *I. platyptera* occurs in the Atlantic Forest domain in the states of ES, MG, and RJ (BFG 2018). In ES, it is represented by a few collections from the dense ombrophilous forest and open ombrophilous forest (Fig. 10), in slope forests. It was included in the Red Book of the Flora of Brazil (Martinelli *et al.* 2013) in the VU category because it is susceptible to changes in its habitat due to urbanization and fires in the mountain regions throughout its habitat. It was included in the List of Threatened Fauna and Flora in the state of ES (Fraga *et al.* 2019) as endangered (EN) due to the low number of known occurrences and in areas where there is habitat loss. The species is not widely represented in Brazilian herbaria.

Specimens of *I. platyptera* can be mistaken with *I. leptantha* due to the shape of the leaflets, but they differ by having up to 3 pairs (*vs.* 1–6 pairs) and larger (9–14 × 3.2–5.3 cm *vs*. 4.5–14.5 × 1–4 cm) leaflets, and inflorescences with bracts about twice the length of the calyx (*vs*. up to 1.5 times the length of the calyx). The analyzed specimens showed variation in the wings of the leaves, and specimens with winged or cylindrical rachis can be found in ES. Collected with flowers in January, March, May, and December and with fruits in May and June.

17. *Inga sessilis* (Vell.) Mart., Flora 20(2): 114. 1837. Fig. 9j-m

Trees 2–6 m tall; young branches tomentose or villous, no exfoliating. Stipules 9–13 mm long, lanceolate, caducous; petiole 1.5–2.7 cm long, winged, tomentose to villous; rachis 5.3–16 cm long, winged; foliar nectaries sessile, cupuliform, circular to transversely compressed; leaflets 4–8 pairs, 6.8–16 × 3–6 cm, elliptic, lanceolate or oblanceolate, apex acute to acuminate, base acute, rounded or obtuse, villous to glabrescent adaxially, villous abaxially. Inflorescence axillary, solitary, a lax raceme; peduncle 20–55 mm long, tomentose to villous; floral rachis 18–28 mm long; bracts 6–7 mm long, ovate, caducous. Flowers sessile to pedicellate; pedicel ca. 3 mm long; calyx closed in bud, 15–25 mm long, campanulate, no striate, no inflated, villous; corolla 25–30 mm long, campanulate, sericeous; androecium with 200–249 stamens, 74–75 mm long, staminal tube included, 13–20 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 15–16 × 2.5–3.4 cm, plane, margins narrow, convex, velutinous.

Selected specimens: Castelo, Parque Estadual do Forno Grande, -20.6035, -41.1847, 14.X.2000, fr., *J.M.L. Gomes 2894* (VIC, VIES). Conceição do Castelo, -20.3683, -41.2439, 20.III.1993, fl., *J.M.L. Gomes 1841* (VIES). Domingos Martins, Parque Estadual de Pedra Azul, -20.3633, -40.6592, 27.I.2012, fr., *A.P. Chagas et al. 62* (VIES). Dores do Rio Preto, Parque Nacional do Caparaó, -20.6888, -41.8453, 22.X.2012, fr., *T.B. Flores 1418* (RB). Itaguaçu, Caparaó, -19.7413, -40.9811, 17.VII.2007, fl., *L.J.C. Kollmann 9956* (MBML). Iúna, Serra do Valentim, -20.3458, -41.5358, 30.V.2013, fr., *J.P.F. Zorzanelli et al. 692* (VIES). Santa Maria de Jetibá, Garrafão, fl., -20.0405, -40.7461, 19.IV.2009, *T.S. Lorencini et al. 272* (VIES). Venda Nova do Imigrante, Sítio Guaçuvirá, -20.3397, -41.1347, 1.II.1995, fl., *D.A. Folli 2545* (CVRD, VIC, VIES).

Inga sessilis is endemic to Brazil, occurring in the Amazon and Atlantic Forests and the Cerrado in the states of BA, ES, MG, PA, PR, RJ, RS, SC, and SP (BFG 2018). In ES, it occurs in the seasonal semideciduous forest, dense ombrophilous forest, and open ombrophilous forest (Fig. 10).

Inga sessilis is recognized by the following set of characters: the largest number of leaflet pairs (4–8), among the species of *Inga* in ES; coriaceous and large flowers, with a calyx measuring between 15 and 25 mm in length and corolla between 25 and 30 mm long; falcate woody fruits with a dense velutinous and ferruginous indumentum. Collected with flowers from February to July and with fruits in January, from May to July, September, and October. Local names: *ingá-ferradura* and *ingá-macaco*.

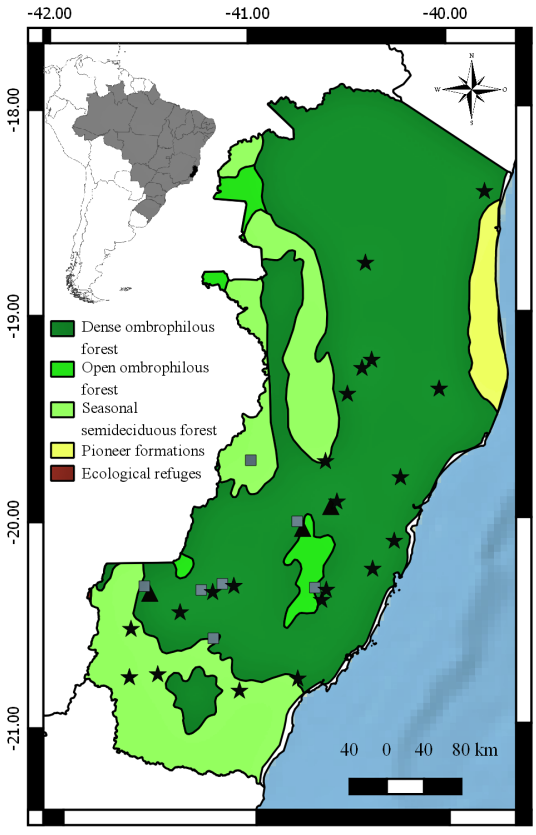

Figure 10 – Geographic distribution of *Inga* species in the state of Espírito Santo (black triangle = *I. platyptera*; gray square = *I. sessilis*; black star = *I. striata*).

18. *Inga striata* Benth., London J. Bot. 4: 608. 1845. Fig. 11a-e

Trees 4–18 m tall; young branches tomentose, no exfoliating. Stipules 7–12 mm long, lanceolate, caducous or persistent; petiole 1–4.4 cm long, terete, glabrescent to villous; rachis 7–14 cm long,

winged, at least between the pairs of terminal leaflets; foliar nectaries sessile, cupuliform to patelliform, circular; leaflets 3–5 pairs, 8.5–22 × 2.8–11 cm, elliptic to obovate, apex acute to acuminate, base oblique to rounded, glabrescent adaxially, villous abaxially. Inflorescence axillary, solitary or fasciculate, a congested spike; peduncle 27–110 mm long, glabrescent, tomentose to villous; floral rachis 6–25 mm long; bracts 3–6.2 mm long, linear or narrowly elliptic, persistent. Flowers sessile; calyx open in bud, 7.3–10.8 mm long, tubular or campanulate, striate, no inflated, glabrescent to sparsely sericeous; corolla 15.8–23 mm long, infundibuliform, sericeous; androecium with 80–110 stamens, 37.3–50 mm long, staminal tube included to exserted, 21–22 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 12–22 × 1.5–2.5 cm, quadrangular, margin expanded, faces exposed, straight, tomentose to glabrescent.

Selected specimens: Alegre, estrada sentido Jerônimo Monteiro, -20.7636, -41.5331, 25.IX.1991, fr., *V. de Souza 199* (CVRD, VIES). Aracruz, Praia de Coqueiral, -19.8202, -40.2733, 18.III.1993, fr., *R.N. Oliveira 465* (VIES). Cachoeiro de Itapemirim, Bananal do Norte, -19.8203, -40.2733, 24.II.1993, fl., *G. Acácio 30* (VIES). Cariacica, Sítio Taquaruçú, -20.2639, -40.4199, 7.IX.2004, fr., *F.Z. Saiter 168* (VIES). Conceição da Barra, Flona do Rio Preto, região extremo sul, -18.4325, -39.8352, 7.II.2020, fr., *R.M. Oliveira et al. 105* (VIES). Conceição do Castelo, Alto Bananal, -20.3682, -41.2439, 6.XI.1986, fr., *G. Hatschbach & J.M. Silva 50703* (CEPEC, MBM). Domingos Martins, -20.2639, -40.4199, 14.III.2001, fr., *O.J. Pereira 6885* (VIES). Governador Lindenberg, Pedra de Santa Luzia, -19.2880, -40.4655, 7.XI.2007, fr., *V. Demuner et al. 4489* (MBML, RB). Guaçuí, Floresta do Rosal, -20.7756, -41.6794, 7.IX.2010, fl., *R.A. Curto et al. 86* (VIES). Ibitirama, Santa Marta, -20.5414, -41.6671, 10.IV.2012, fl., *H.M. Dias et al. 669* (VIES). Iconha, Campinho de Iconha, propriedade de Erenilda, -20.7931, -40.8111, 7.VIII.2013, fr., *P. Arantes 209* (SAMES). Linhares, Reserva Natural Vale, -19.3911, -40.0722, 13.XI.1984, fl., *G.L. Farias 43* (CVRD, VIES). Marechal Floriano, Rio Jucu/Sul, -20.4127, -40.6831, 25.VIII.2000, fl., *O.J. Pereira & E. Espindula 6443* (VIES). Marilândia, Liberdade, -19.4127, -40.5416, 27.IX.2006, fr., *L.F.S. Magnago 1434* (MBML, VIES). Muniz Freire, Fazenda Antônio B. V. Machado, -20.4641, -41.4131, 22.IX.2001, fr., *V. de Souza 192* (CVRD, VIES). Nova Venécia, Serra de Baixo, -18.7769, -40.4438, 19.II.2008, fr., *P.H. Labiak et al. 4699* (MBML, RB). Rio Bananal, Alto Mun. de Rio Bananal, -19.2486, -40.4161, 1.VIII.2007, fr., *R.R. Vervloet et al. 3083* (MBML, RB). Santa Teresa, Estação Biológica de São Lourenço, -19.9356, -40.6003, 26.VIII.1998, fl., *L.J.C. Kollmann et al. 428* (MBML, VIES). São Roque do Canaã, Santa Júlia, -19.7388, -40.6568, 7.III.2004, fr., *F.Z. Saiter 46* (VIC, VIES). Serra, Morro do Nilante, -20.1286, -40.3078, 11.IV.1995, fl., *I. Weiler Junior et al. 143* (VIES). Venda Nova do Imigrante, Sítio Guaçuvirá, -20.3397, -41.1347, 1.II.1995, fl., *D.A. Folli 2552* (CVRD, VIC, VIES).

Species widely distributed in South America, occurring in Guyana, Colombia, Ecuador, Peru, and Bolivia (Pennington 1997). In Brazil, it is found in the Amazon and Atlantic Forests and the Cerrado in the states of AC, BA, ES, MG, MT, PA, PB, PE, PR, RJ, RO, RS, SC, and SP (BFG 2018). *Inga striata* has abundant specimen records in ES, in dense ombrophilous forest, open ombrophilous forest, and seasonal semideciduous forest (Fig. 10), in areas of slope forests and *tabuleiro* forests.

This species is recognized by its inflorescences on a spike, striated calyx, and fruits with a quadrangular section, glabrescent, and yellow when mature. Collected with flowers from February to November and with fruits from January to November. Local name: *ingá-branco*.

19. *Inga subnuda* subsp. ***luschnathiana*** (Benth.) T.D. Penn., Gen. *Inga*, Bot. 753. 1997. Fig. 11j-l

Trees 4–16 m tall; young branches tomentose to villous, no exfoliating. Stipules 2.5–3 mm long, ovate, caducous; petiole 0.7–1.5 cm long, terete, tomentose to villous; rachis 2.7–14 cm long, winged; foliar nectaries sessile, cupuliform, circular; leaflets (2–)3–4 pairs, 6.7–15 × 3.5–10 cm, elliptic to obovate, apex acuminate, acute or obtuse, base obtuse to rounded, villous. Inflorescence axillary, fasciculate, spike or raceme; peduncle 10–30 mm long, tomentose; floral rachis 8–37 mm long; bracts 1.5–2.1 mm long, ovate, caducous. Flowers sessile to subsessile; calyx open in bud, 5–7.5 mm long, campanulate, no striate, no inflated, tomentose; corolla 15–20.5 mm long, campanulate to infundibuliform, sericeous to villous; androecium with 91–95 stamens, 70–73 mm long, staminal tube exserted or included, 14–27 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 5.8–16 × 2.2–2.5 cm, quadrangular, margin expanded, faces exposed, straight to curved, tomentose to villous.

Selected specimens: Domingos Martins, margem do Rio Jucu, -20.3633, -40.6592, 23.X.2000, fr., *O.J. Pereira & E. Espindula 6382* (VIES). Fundão, Goiapaba-Açu, -19.914, -40.4722, 6.VIII.1998, fr., *L. Kollmann et al. 308* (MBML). Muqui, Santa Mônica, -20.9250, -41.2923, 24.IV.2007, fl., *A.P. Fontana et al. 3147* (MBML). Santa Teresa, Reserva Biológica Augusto Ruschi, -19.9356, -40.6003, 24.X.2012, fr., *A.P. Chagas et al. 60* (VIES).

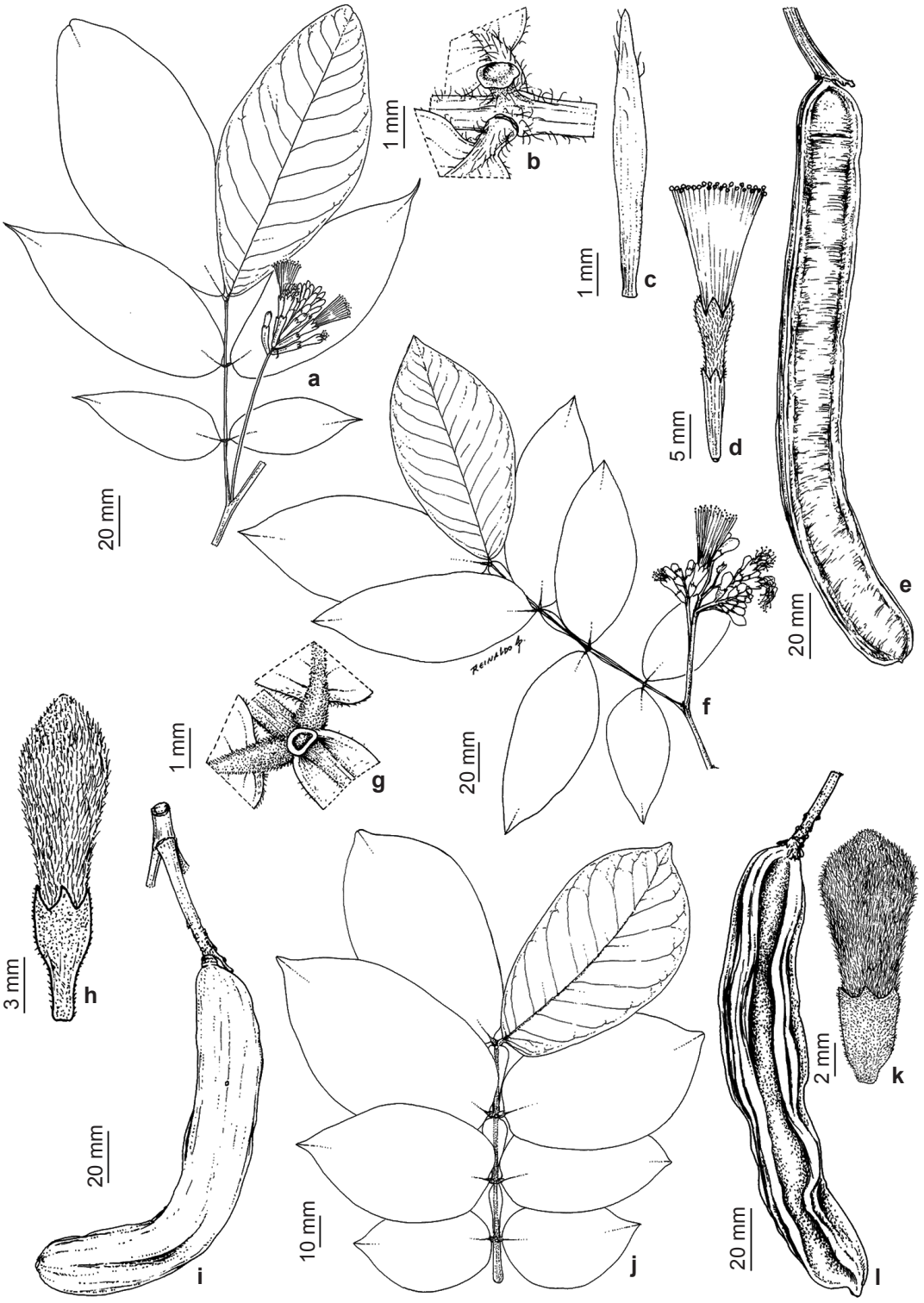

Figure 11 – a-e. *Inga striata* – a. reproductive branch; b. foliar nectary; c. bract; d. flower; e. legume. f-i. *Inga subnuda* subsp. *subnuda* – f. reproductive branch; g. foliar nectary; h. floral bud; i. legume. j-l. *Inga subnuda* subsp. *luschnathiana* – j. leaf; k. floral bud; l. legume. (d. *G.L. Farias 43*; e. *F.Z. Saiter 46*; h. *P.L. Peterle* VIES 27958; i. *O.J. Pereira & E. Espindula 6881*; k. *D.A. Folli 6049*; l. *A.P. Chagas et al. 60*).

With a distribution restricted to Brazil, *I. subnuda* subsp. *luschnathiana* occurs in the Atlantic Forest in the states of MG, PR, RJ, SC, and SP (Pennington 1997; BFG 2018). In this study, the documented occurrence of the subspecies was extended to ES in areas of dense ombrophilous forest (Fig. 12), where it is present at low frequencies in slope forests. This occurrence extends the northern limit of distribution of the subspecies, now sympatry with *I. subnuda* subsp. *subnuda*.

Inga subnuda subsp. *luschnathiana* differs from *I. subnuda* subsp. *subnuda* mainly due to the foliar rachis, which is totally winged, and quadrangular fruits with closed faces in the former. Meanwhile, the subspecies type has a cylindrical or narrowly winged foliar rachis, usually only between the last pairs of leaflets, and subcylindrical to cylindrical fruits with covered faces. The character for the presence or absence of pedicels in the flowers described by Pennington (1997) and Garcia (1998) was not consistent as a differentiating feature of the subspecies. In areas where they occur in sympatry, there is often an overlap of morphological characters, making it challenging to identify some individuals at the subspecies level. Collected with flowers in April and May and with fruits in April, May, August, October, and December.

20. *Inga subnuda* Salzm. *ex* Benth. subsp. ***subnuda***, London J. Bot. 4: 613. 1845. Fig. 11f-i

Trees 3–16 m tall; young branches tomentose to villous, no exfoliating. Stipules 1.5–2.2 mm long, ovate, caducous; petiole 0.6–4 cm long, terete, tomentose to villous; rachis 3.5–13 cm long, terete to winged, at least between the pairs of terminal leaflets; foliar nectaries sessile, cupuliform, circular to triangular; leaflets 3–6 pairs, 7–18.6 × 3–10 cm, elliptic to obovate, apex acute to acuminate, base obtuse to rounded, sparsely villous adaxially, villous abaxially. Inflorescence axillary, fasciculate, spike or raceme; peduncle 10–30 mm long, tomentose; floral rachis 8–37 mm long; bracts 1.5–2.1 mm, ovate, caducous. Flowers sessile to pedicellate; pedicel up to 6 mm long; calyx open in bud, 3–6 mm long, campanulate, no striate, no inflated, tomentose; corolla 13–24.5 mm long, campanulate to infundibuliform, sericeous to villous; androecium with 79–145 stamens, 40–60 mm long, staminal tube included, 9–15.6 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 6.4–18 × 2.2–3 cm, subcylindric to cylindric, margins expanded, faces covered, straight to falcate, tomentose.

Selected specimens: Águia Branca, Rochedo, área de afloramento rochoso, propr. Ailton Corteleti, -18.9441, -40.7986, 6.IX.2006, fl., *L.F.S. Magnago et al. 1328* (MBML, VIES). Anchieta, estrada para Castelhanos, -20.8058, -40.6456, 2.II.2012, fr., *N.E. Oliveira Filho 86* (VIES). Aracruz, Barra do Sahy, -19.8203, -40.2733, 13.VIII.1992, fl., *O.J. Pereira et al. 3676* (VIES). Baixo Guandu, Sítio Alegrete, -19.5188, -41.0158, 31.VIII.2004, fl., *A.A. da Luz 219* (CVRD, VIES). Conceição da Barra, Reserva Biológica de Córrego Grande, -18.5933, -39.7322, 9.II.2010, fl., *M. Ribeiro et al. 85* (SAMES). Domingos Martins, Fazenda Candelária, -20.3633, -40.6592, 14.III.2001, fr., *O.J. Pereira & E. Espindula 6881* (VIES). Guarapari, Parque Estadual Paulo César Vinha, -20.6580, -40.5110, 26.X.2010, fl., *P.L. Peterle et al.* (VIES 27958). Linhares, Reserva Biológica de Comboios, -19.3911, -40.0722, 12.IX.1994, fl., *I. Weiler Júnior 75* (VIC, VIES). Marilândia, Pedra

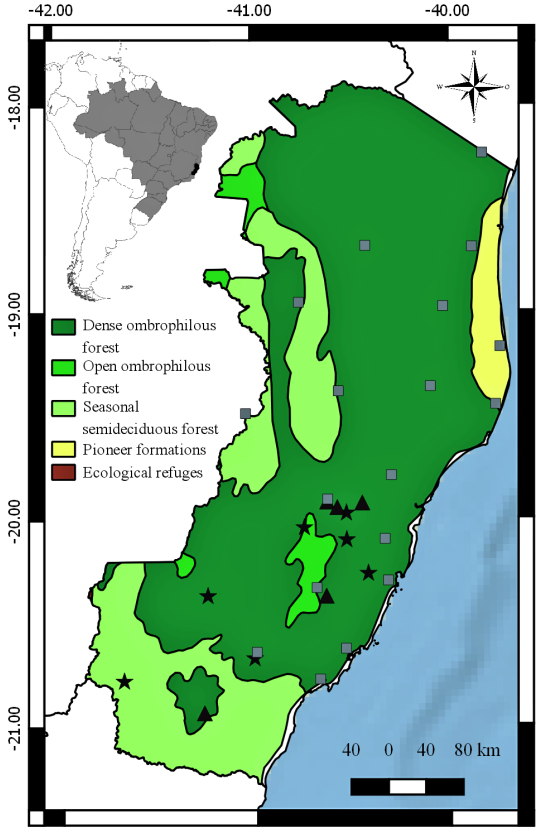

Figure 12 – Geographic distribution of *Inga* species in the state of Espírito Santo (black triangle = *I. subnuda* subsp. *luschnatiana*; gray square = *I. subnuda* subsp. *subnuda*; black star = *I. tenuis*).

do Cruzeiro, -19.3483, -40.5511, 26.IX.2006, fl., *L.F.S. Magnago et al. 1401* (MBML, VIES). Nova Venécia, APA Pedra do Elefante, -18.7105, -40.4006, 5.V.2015, fr., *W.O. Souza et al. 441* (VIES). Santa Teresa, Reserva Biológica Augusto Ruschi, -19.9356, -40.6003, 24.X.2012, fl., *A.P. Chagas et al. 57* (VIES). São Mateus, Bairro Quadrado, -18.7161, -39.8589, 28.VIII.2009, fl., *M. Ribeiro et al. 21* (SAMES). Serra, Jacaraípe, -20.1286, -40.3078, 1.I.1996, fl., *A.R. Azevedo & F. Passamani 81* (VIES). Sooretama, Reserva Biológica de Sooretama. Porção Oeste, estrada do Picadão, -19.0038, -40.0066, 19.I.2010, fr., *A.O. Giaretta et al. 722* (SAMES, VEIS). Vargem Alta, -20.6733, -40.97, 4.II.2015, fr., *D.T. Iglesias et al.* (VIES 36151). Vila Velha, Interlagos, -20.3297, -40.2925, 28.VIII.2012, fr., *L.A. Silva et al. 251* (VIES).

Restricted to the east coast of Brazil, *I. subnuda* subsp. *subnuda* occurs in the Atlantic Forest domain of the states of BA, ES, MG, PB, and PE (Pennington 1997; BFG 2018). In ES, the subspecies is widely distributed in the dense ombrophilous forest, open ombrophilous forest, semideciduous seasonal forest, and pioneer formations (Fig. 12), mainly in the slope forests, *tabuleiro* forests, and *restingas*.

The diagnostic characters for *I. subnuda* subsp. *subnuda* can be found above in the comments of *I. subnuda* subsp. *luschnathiana*. Collected with flowers from January to April and from July to December and with fruits throughout the year.

21. *Inga tenuis* (Vell.) Mart., Flora 20(2): 114. 1837. Fig. 13a-c

Trees 2–8 m tall; young branches tomentose to puberulent, no exfoliating. Stipules 2.3–6 mm long, linear, caducous; petiole 0.2–0.4 cm long, marginate to winged, glabrescent; rachis 2–7.7 cm long, marginate; foliar nectaries sessile to shortly stalked, cyathiform, circular; leaflets (3–)4–11 pairs, 2.3–4 × 0.7–1.5 cm, elliptic to rhombic, apex acute to mucronate, base obtuse, glabrous. Inflorescence axillary, solitary or 2 in each axil, capitate; peduncle 52–150 mm long, tenuous, pendulous, glabrescent; floral rachis 1.5–2.7 mm long; bracts 0.7–1 mm long, spatulate, caducous. Flowers sessile to pedicellate; pedicel up to 2.7 mm long; calyx open in bud, 1.5–2.5 mm long, tubular, no striate, no inflated, glabrescent; corolla 8.5–10 mm long, infundibuliform, glabrous, lobes puberulent; androecium with 21–35 stamens, 24.5–32.4 mm long, staminal tube exserted, 12 –13.5 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 13.5–25 × 1–2 cm, plane, margins narrow, straight, glabrous.

Selected specimens: Cariacica, Reserva Biológica de Duas Bocas, -20.2913, -40.5194, 18.I.2009, fl., *R.C. Forzza et al. 5414* (CEPEC, RB, UPCB). Conceição do Castelo, -20.3682, -41.2439, 18.X.1985, fr., *G. Hatschbach et al. 49933* (MBM). Guaçuí, Floresta do Rosal, -20.7756, -41.6794, 21.IV.2012, fl., *C. Lage & K.C. Castro 39* (VIES). Santa Leopoldina, Cachoeira da Fumaça, -20.1006, -40.5297, 3.VII.1984, fr., *W. Boone 242* (CEPEC, HUEFS, MBML, VIES). Santa Maria de Jetibá, Rio das Pedras, -20.0691, -40.7255, 10.XII.2002, fl., *L.J.C. Kollmann et al. 5839* (MBML, VIES). Santa Teresa, Estação Biológica de Santa Lúcia, -40.6700, -19.8166, 16.I.1995, fl., *R.R. dos Santos 410* (MBML). Vargem Alta, -20.6714, -41.0069, 3.II.2015, fl., *D.T. Iglesias et al.* (VIES 25053).

Inga tenuis is restricted to Brazil in the Atlantic Forest domain of the states of BA, ES, RJ, and SE (Mata 2009; BFG 2018). Abundant specimen records exist in ES from the dense ombrophilous forest, mainly in slope forests, with a few records from the open ombrophilous forest and seasonal semideciduous forest (Fig. 12). The observations of Garcia (1998) limited the species to the understory of the dense ombrophilous forest, generally on the margins of rivers and streams.

This species is commonly confused in the herbarium with *I. schinifolia* Bentham (1845: 584). These species are quite similar due to the foliage formed by small and numerous leaflets, but *I. tenuis* has a pendulum and long peduncle (5.2–15 cm long), and linear fruits, while *I. schinifolia* has an erect and short peduncle (3–5.2 cm long), and spiral legumes (Garcia 1998). Collected with flowers from January to July, October, and December and with fruits in July, August, and October.

22. *Inga teresensis* F.C.P.Garcia & A.P.Chagas, Phytotaxa 521: 96. Fig. 13d-g

Shrubs, rarely scandent, 3–5 m tall; young branches hirsute, no exfoliating. Stipules ca. 2 mm long, linear, caducous; petiole 0.7–2 cm long, winged, hirsute; rachis 1.3–2.5 cm long, winged; foliar nectaries stalked, capitate to terete, circular; leaflets 1–2 pairs, 5–6.7 × 2.5–3.3 cm, obovate, apex acuminate, mucronate, base acute to obtuse, hirsute. Inflorescence axillary, solitary or fasciculate, raceme; peduncle 20–50 mm long, hirsute; floral rachis 30–60 mm long; bracts ca. 2 mm long, triangular, caducous. Flowers pedicellate to sessile in apex of inflorescence; pedicel up to 4 mm long; calyx open in bud, 4–5.5 mm long, tubular, no striate, no inflated, hirsute;

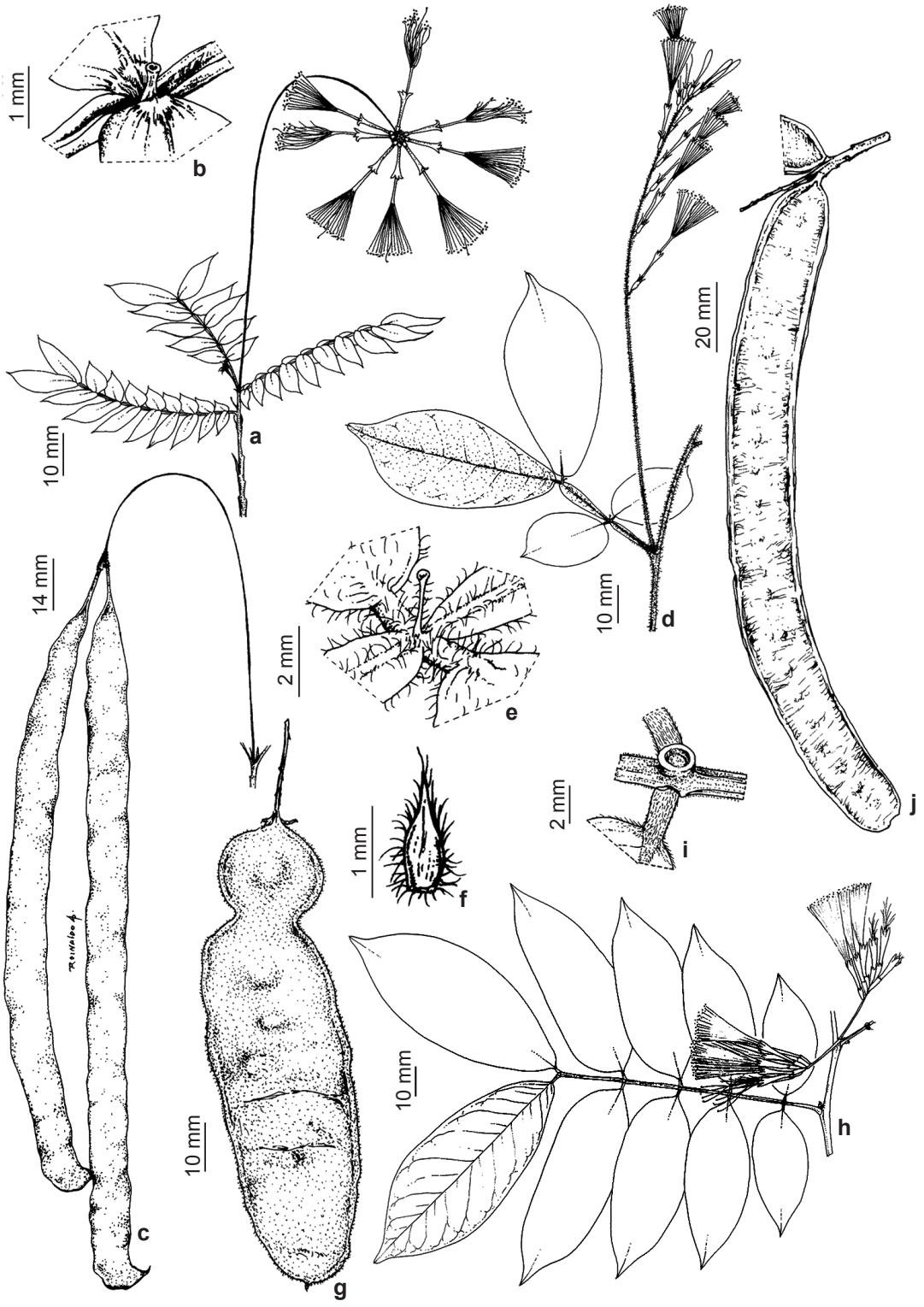

Figure 13 – a-c. *Inga tenuis* – a. reproductive branch; b. foliar nectary; c. legume. d-g. *Inga teresensis* – d. reproductive branch; e. foliar nectary; f. bract; g. legume. h-j. *Inga thibaudiana* subsp. *thibaudiana* – h. reproductive branch; i. foliar nectary; j. legume. (b. *R.R. dos Santos 410*; c. *C.C. Chamas 269*; f. *W. Boone 384*; g. *R.R. Vervloet et al. 768*; i. *O.J. Pereira et al. 6972*; j. *D.A. Folli 2215*).

corolla 14.6–17.8 mm, infundibuliform, hirsute; androecium with ca. 37 stamens, ca. 35 mm long, staminal tube included to exserted, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 6–9.7 × 2–2.8 cm, plane, margins narrow, straight, villous.

Selected specimens: Santa Teresa, Estação Biológica da Caixa D'Água, -19.9356, -40.6003, 17.IV.1985, fl., *W. Boone 384* (CEPEC, HUEFS, HRCB, MBML, RB, VIES).

This species is only known to occur in the municipality of Santa Teresa, in the Central Mountain Region of the ES state, in dense ombrophilous forest (Fig. 14) in areas of slope forests.

Inga teresensis is similar to *I. cabelo, I. ciliata,* and *I. leptantha* due to its hirsute stipules, cylindrical, or capitated branches and nectaries. The presence of only 1 or 2 pairs of obovated leaflets, dense-hirsute on both sides, differs this species from *I. ciliata* and *I. leptantha*. The presence of 2 pairs of leaflets may be frequent in *I. cabelo*, but the latter species has a petiole and leaf rachis commonly without wings (*vs.* always winged in *I. teresensis*), sessile flowers (*vs*. pedicellate flowers), and calyx with acute lobes (*vs*. calyx with filiform lobes). Another characteristic that distinguishes *I. teresensis* is the presence of villous fruits, while the other species mentioned have hirsute fruits. Collected with flowers in April and October and with fruits in August and September.

23. *Inga thibaudiana* DC. subsp. ***thibaudiana***, Prod. 2:434. 1825. Fig. 13h-j

Trees 5–10 m tall; young branches tomentose, no exfoliating. Stipules inconspicuous, caducous; petiole 0.8–3.3 cm long, terete, tomentose; rachis 2.7–15 cm long, terete; foliar nectaries sessile, cupuliform, circular to transversely compressed; leaflets (3–)4–6 pairs, 7.5–13 × 3.5–6.5 cm, elliptic to ovate, apex acuminate, base acute, rounded or assymmetrical, glabrescent adaxially, tomentose abaxially. Inflorescence axillary, solitary or fasciculate, a congest spike; peduncle 13–40 mm long, tomentose; floral rachis 7–40 mm long; bracts 0.5–1.5 mm long, ovate, caducous. Flowers sessile to subsessile; calyx open in bud, 3–6 mm long, tubular, no striate, no inflated, tomentose; corolla 16–23 mm long, infundibuliform, sericeous; androecium with 35–65 stamens, 42–57 mm long, staminal tube included to slightly exserted, 19–22.5 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 14.5–23 × 1.6–2.4 cm, plane, margins narrow, straight, tomentose.

Selected specimens: Aracruz, microbacia, grid. 2, -19.8203, -40.2733, 30.VII.1997, fl., *E.T. Scopel 71* (VIES). Cachoeiro de Itapemirim, Bananal do Norte, -20.8489, -41.1128, 4.IX.1995, fl., *G. Acácio 212* (VIES). Conceição da Barra, Parque Estadual de Itaúnas, -18.4166, -39.7166, 24.VIII.2002, fl. and fr., *O.J. Pereira et al. 6972* (VIES). Ecoporanga, Patrimônio do Dois, -18.3733, -40.8766, 7.VII.2012, fl., *I.V. Damaceno et al. 63* (MBML). Governador Lindenberg, Santa Luzia, -19.2758, -40.4633, 2.VIII.2007, fl., *R.R. Vervloet 3151* (MBML). Itapemirim, Barra do Itapemirim, -21.0111, -40.8339, 17.VIII.1993, fl., *V. de Souza 522* (CVRD, VIES). Linhares, Reserva Natural Vale, -19.3911, -40.0722, 21.II.1994, fr., *D.A. Folli 2215* (CVRD, VIES). Pancas, Fazenda Gambá, Propriedade de Agustinho Coelho, -19.2250, -40.8514, 16.VIII.1990, fl., *E.N. Moraes 13* (CVRD, VIES). Pinheiros, Reserva Biológica Córrego do Veado, mata da água limpa, -18.3703, -40.2132, 24.I.2011, fr., *A.O. Giaretta et al. 918* (SAMES). Santa Leopoldina, Cachoeira Recanto

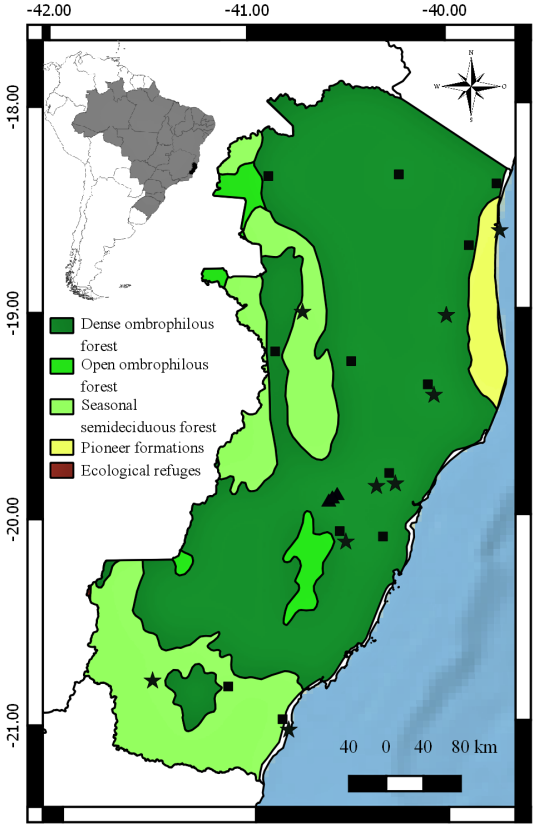

Figure 14 – Geographic distribution of *Inga* species in the state of Espírito Santo (black triangle = *I. teresensis*; black square = *I. thibaudiana* subsp. *thibaudiana*; black star = *I. unica*).

da Mata, -20.1006, -40.5297, 1.XI.2007, fl., *F.L.R. Filardi et al. 777* (RB, VIES). São Mateus, Bairro Litorâneo, -18.7161, -39.8589, 3.X.2009, fl., *M. Ribeiro 48* (SAMES, VIES). Serra, Parque Ecológico da C.S.T., -20.1286, -40.3078, 22.IV.1995, fr., *I. Weiler Júnior et al. 207* (VIES).

Inga thibaudiana subsp. *thibaudiana* has a wide distribution, occurring from Mexico to the tropical region of South America (Pennington 1997; Garcia 1998). In Brazil, it is found in the Amazon and Atlantic Forests, and the Caatinga and Cerrado domains of the states of AC, Alagoas (AL), AM, AP, BA, CE, ES, GO, MA, MG, MS, MT, PA, PB, PE, RJ, RO, RR, SP, and DF (BFG 2018). In ES, the subspecies was registered in dense ombrophilous forest and seasonal semideciduous forest (Fig. 14), in areas of slope forests, *tabuleiro* forests, and *restingas*. In the Atlantic Forest, Garcia (1998) reported the subspecies as occurring only in the region of *tabuleiro* and seasonal forests.

Pennington (1997) established three subspecies for *I. thibaudiana*: *peltadenia*, *russotomentella*, and *thibaudiana*. *Inga thibaudiana* subsp. *thibaudiana* is characterized by puberulous inflorescences, cylindrical leaf rachis, and abaxially sericeous to subglabrous leaflets. Collected with flowers from May to December and with fruits from January to September and December.

24. *Inga unica* Barneby & J.W.Grimes, Brittonia 46(1): 66. 1994. Fig. 15a-b

Trees 3–10 m tall; young branches densely villous, no exfoliating. Stipules 2.5–4 mm long, linear, persistent; petiole 0.5–1.6 cm long, canaliculate, villous; rachis 0.7–6.7 cm long, canaliculate; foliar nectaries absent; leaflets 2–3 pairs, 4.4–11 × 1.8–4.6 cm, obovate to elliptic, apex acute to acuminate, mucronate, base obtuse, villous. Inflorescence axillary, solitary or fasciculate, capitate; peduncle 60–120 mm long, hirsute; floral rachis globose; bracts 2.5–7 mm long, elliptic to linear, persistent. Flowers sessile to subsessile; calyx open in bud, 4–6.5 mm long, campanulate, no striate, no inflated, hirsute; corolla 6–8.8 mm long, infundibuliform, hirsute; androecium with 35–40 stamens, 25–28 mm long, staminal tube exserted, 13–14 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 12–30 × 1.8–2 cm, plane, margins narrow, spirally twisted, villous.
Selected specimens: Águia Branca, Santa Luzia, -18.9777, -40.6655, 18.X.2006, fr., *V. Demuner et al. 2957* (RB, VIES). Alegre, -20.7635, -41.5331, 26.I.2014, fl., *V.C. Manhães 491* (VIES). Aracruz, M7-1, -19.8203, -40.2733, 4.VI.1993, fl., *R.N. Oliveira* 442 (RB, VIES). Conceição da Barra, Reserva Biológica Córrego do Veado, -18.5933, -39.7322, 12.II.2009, fl., *A.Q. Lobão et al. 1461* (SAMES, VIES). Ibiraçu, Estação Ecológica Morro da Vargem, -19.8894, -40.3769, 26.V.1990, fl., *J.M.L. Gomes 1131* (MBML, VIES). Itapemirim, Fazenda do Ouvidor - Usina Paineiras, -21.0111, -40.8339, 25.I.2008, fl., *A.M. Assis & V. Demuner 1369* (MBML, VIES). Linhares, Comboios, -19.3911, -40.0722, 27.IX.1993, fr., *O.J. Pereira & J.M.L. Gomes 4939* (VIES). Santa Leopoldina, Fazenda Caioaba, -20.1006, -40.5297, 25.X.2007, fl., *V. Demuner et al. 4426* (HUEFS, RB, VIES). Sooretama, Reserva Biológica de Sooretama, -19.0038, -40.0066, 28.V.2012, fr., *L.F.T. Menezes 1996* (SAMES).

This species is restricted to Brazil, occurring in the Atlantic Forest domain in the states of BA and ES (Pennington 1997; BFG 2018). In ES, the species is widely distributed in dense ombrophilous forest, seasonal semideciduous forest, and pioneer formations (Fig. 14), occupying areas of slope forests, *tabuleiro* forests, and *restingas*. The observations recorded by Garcia (1998) for *I. unica* restricted it to the regions of *tabuleiro* forests; this study extends its distribution as indicated above. The species has been classified as VU (Martinelli *et al.* 2013; Fraga *et al.* 2019) due to the intense human impact on some of its areas of occurrence.

Inga unica can be recognized among the congeneric species found in ES by the following set of characters: cylindrical leaf rachis, villous indumentum, absent leaf nectaries, capituliform inflorescence, and spirally twisted legume. Collected with flowers from January to June and October and with fruits in February, May, August, September, and October.

25. *Inga vera* Willd. subsp. ***affinis*** (DC) T.D. Penn., Gen. Inga, Bot. 716. 1997. Fig. 15c-g

Trees 4–10 m tall; young branches tomentose, no exfoliating. Stipules not observed; petiole 1–2.2 cm long, terete to winged, villous; rachis 4.3–19 cm long, winged; foliar nectaries sessile to subsessile, patelliform, circular; leaflets 4–6 pairs, 6–14 × 2–7 cm, elliptic to oblanceolate, apex acute to acuminate, base acute, obtuse or rounded, pubescent adaxially, tomentose abaxially. Inflorescence axillary, fasciculate, spike or raceme; peduncle 7–63 mm long, tomentose; floral rachis 6–45 mm long; bracts 3.6–4.5 mm long, ovate, caducous. Flowers sessile to pedicellate; pedicel to 4 mm long; calyx closed in bud, 7–10 mm long, tubular to campanulate, no striate, no

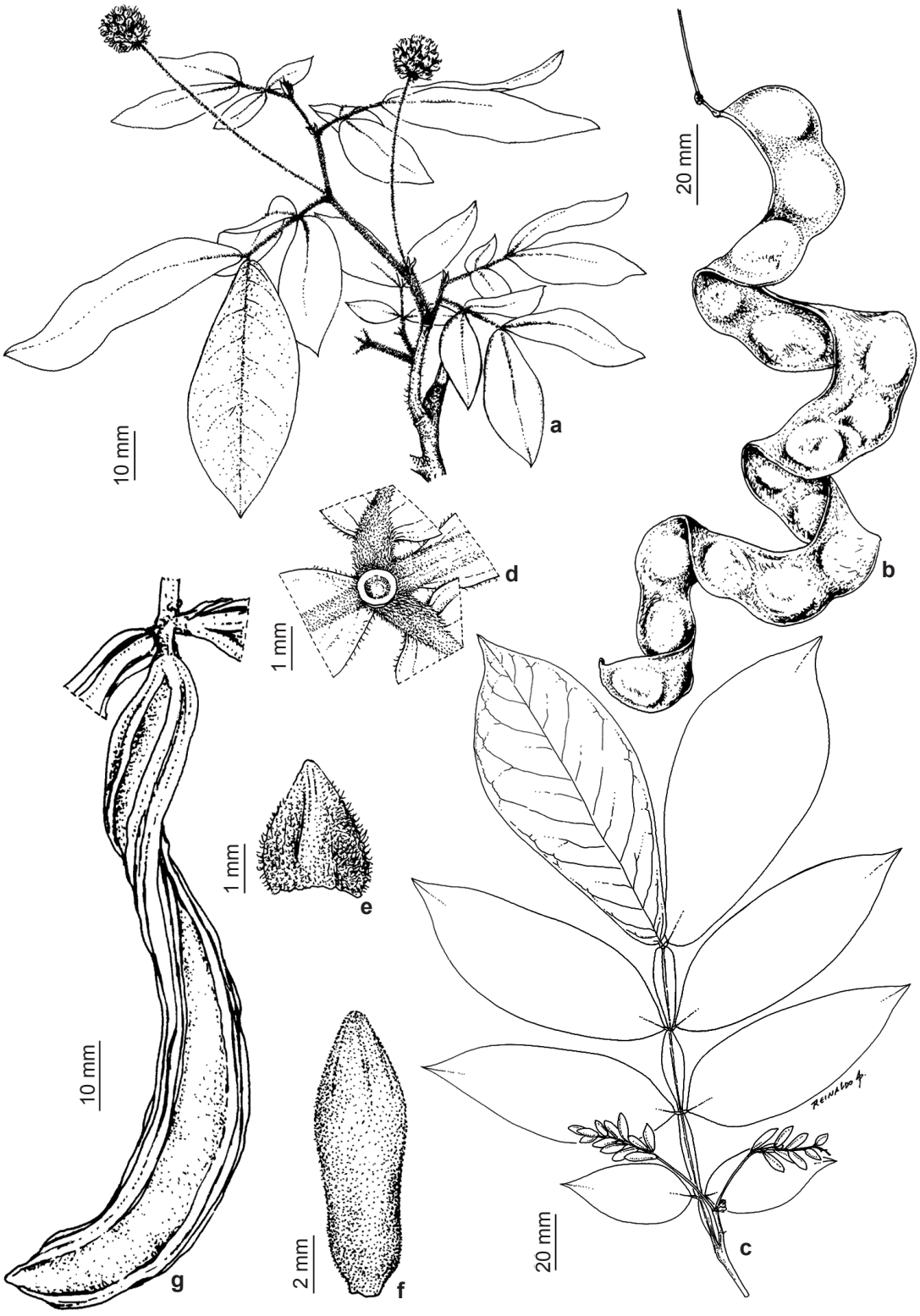

Figura 15 – a-b. *Inga unica* – a. reproductive branch; b. legume. c-g. *Inga vera* subsp. *affinis* – c. branch; d. foliar nectary; e. bract; f. floral bud; g. legume. (a. *J.M.L. Gomes 1131*; b. *O.J. Pereira & J.M.L. Gomes 4939*; f. *J.M.L. Gomes 3115*; g. *A.M. Assis 676*).

inflated, tomentose; corolla 15–19.8 mm long, infundibuliform, sericeous; androecium with 73–96 stamens, 54–68.7 mm long, staminal tube included to exserted, 13.5–21 mm long, filaments whitish; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 7.6–15 × 1.2–1.5 cm, cylindric to quadrangular, margin expanded, faces exposed, straight or curved, tomentose.

Selected specimens: Águia Branca, propriedade do Sr. João Ferreira, área usada como estacionamento para a cachoeira, na margem do rio, -18.9831, -40.7402, 7.I.2018, *V.F. Dutra & L.A. Silva 898* (VIES). Alegre, São João do Norte, -20.7636, -41.5331, 15.X.2008, fl., *D.R. Couto 987* (MBML, VIES). Cachoeiro do Itapemirim, estrada Burarama, -20.8489, -41.1128, 11.IX.2007, fl. and fr., *D.A. Folli 5692* (CVRD, VIC, VIES). Guarapari, -20.6580, -40.5110, 29.IV.1975, fr., *P. Occhioni 7220* (RFA). Laranja da Terra, marg. do Rio Guandu, prox. a São João, -19.8988, -41.0567, 8.VII.1996, fr., *G. Hatschbach et al. 65275* (CEPEC, MBM). Linhares, Povoação, -19.5791, -39.7925, 24.X.2008, fl., *L.J.C. Kollmann et al. 11285* (MBML, VIES). Mimoso do Sul, rodovia às margens do Rio Itabapoana, -21.0667, -41.3667, 16.VII.2008, fr., *R.A.X. Borges et al. 903* (RB). Montanha, Fazenda Lagoa Grande e Cavalo Grande, -18.1269, -40.3633, 29.IX.2009, fl., *J.M.L. Gomes 3115* (VIC, VIES). Muniz Freire, PCH Santa Fé, -20.4642, -41.4131, 30.X.2006, fl., *J.M.L. Gomes 2989* (VIES). Rio Bananal, São Jorge de Tiradentes, nos arredores, -19.0967, -40.3180, 7.X.2017, fl., *E.D. Lozano et al. 3880* (MBM). Santa Leopoldina, Foz do Rio Mangaraí com o Rio Santa Maria, -20.1006, 40.5297, 22.IX.2000, fl., *Pereira & E. Espindula 6482* (VIES). Santa Maria de Jetibá, -20.0406, -40.7461, 30.X.2000, fl., *O.J. Pereira & E. Espindula 6528* (VIC, VIES). Santa Teresa, margem do Rio Timbuí, -19.9356, -40.6003, 17.XI.1993, fl., *F.C.P. Garcia & L.D. Thomaz 701* (MBML, INPA). São Roque do Canaã, Barra de Santa Júlia, -19.7388, -40.6569, 17.VII.2003, fr., *A.M. Assis et al. 991* (RB). Serra, margem do Rio Santa Maria, -20.1286, -40.3078, 22.X.2000, fl., *Pereira & E. Espindula 6508* (VIES). Viana, divisa entre Viana e Domingos Martins, margem do Rio Jucu, -20.3758, -40.5597, 19.II.2016, fr., *W.C. Cardoso et al. 418* (VIES). Vila Velha, Parque Natural Municipal de Jacarenema, -20.3297, -40.2925, 10.II.2013, fr., *L.A. Silva 337* (VIES). Vitória, Reserva Ecológica Restinga de Camburi, -20.3194, -40.3378, 23.XII.1998, fl. and fr., *A.M. Assis 676* (VIC, VIES).

Inga vera subsp. *affinis* occurs in tropical South America and Central America (Pennington 1997). In Brazil, it is found in the Amazon and Atlantic Forests and the Cerrado and Pantanal domain in the states of AC, AM, AP, BA, CE, ES, GO, MA, MG, MS, MT, PA, PB, PE, PI, PR, RJ, RO, RR, RS, SC, SP, Tocantins (TO), and DF (BFG 2018). In ES, its occurrence has been recorded in the dense ombrophilous forest, open ombrophilous forest, and seasonal semideciduous forest (Fig. 16), in areas of slope forests and *restingas*.

The diagnostic characters for *I. vera* subsp. *affinis* were mentioned in the comments of *I. ingoides*. Pennington (1997) established three subspecies of *I. vera*: *vera*, *eriocarpa*, and *affinis*. Garcia (1998) analyzed material from the southern and southeastern coastal regions of Brazil and differentiated the subspecies *vera* and *affinis* based on their corolla/calyx size ratio (1.4–1.5 in subsp. *vera* and 1.8–2.3 in subsp. *affinis*), as established by Pennington (1997), and considered all of the material as representing only subsp. *affinis*. This finding was corroborated in the examined material from ES, confirming the earlier results. Collected with flowers in February, April, and from August to December and with fruits from January to April, from July to September, and December. Local name: *ingá-banana*.

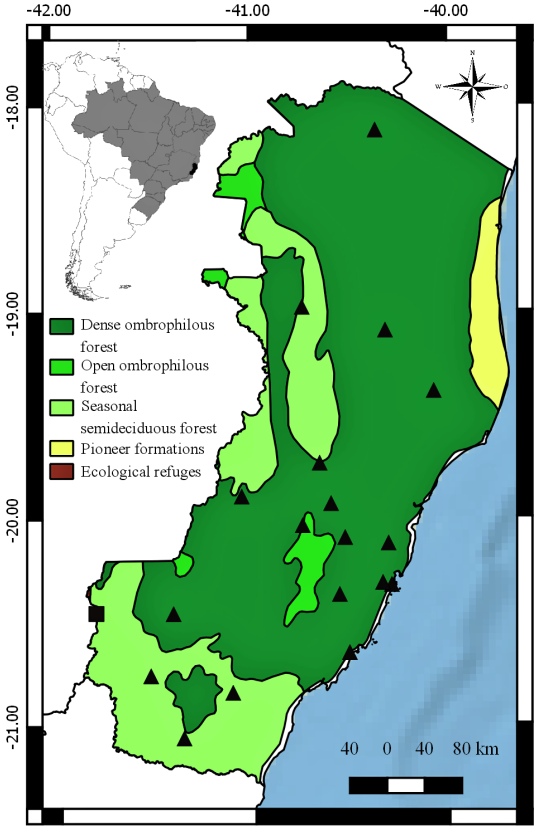

Figure 16 – Geographic distribution of *Inga* species in the state of Espírito Santo (black triangle = *I. vera* subsp. *affinis*; black square = *I. vulpina*).

26. *Inga vulpina* Mart. *ex* Benth., Trans. Linn. Soc. London 30(3): 625. 1875.

Trees 5–10 m tall; young branches hirsute, no exfoliating. Stipules 3–4 mm long, lanceolate or ovate, persistent; petiole 1.5–2.2 cm long, winged, hirsute; rachis 4.9–6 cm long, winged; foliar nectaries stalked, capitate to cylindric, circular; leaflets 3 pairs, 4.5–9.4 × 2.2–3.4 cm, elliptic to obovate, apex acuminate to acute, base acute to asymmetrical, glabrescent adaxially, hirsute abaxially. Inflorescence axillary, solitary or fasciculate, a congested spike; peduncle 65–88 mm long, hirsute; floral rachis 13–17 mm long; bracts ca. 0.5 mm long, ovate, caducous. Flowers sessile; calyx open in bud, 7–10 mm long, campanulate, no striate, no inflated, hirsute; corolla 10–12 mm long, infundibuliform, hirsute; androecium with 40–45 stamens, 20–32 mm long, staminal tube included to exserted, ca. 12 mm long, filaments pink; nectary disk absent; gynoecium 1 carpel; ovary glabrous. Legume nucoid 6.4–9.8 × 2.4–2.7 cm, plane, margins narrow, straight, hirsute.

Selected specimens: Dores do Rio Preto, Parque Nacional do Caparaó, Macieira, -20.4579, -41.8087, 22.IV.2006, fl., *C.G. Viana et al. 69* (HUEMG).

Additional specimens: BRAZIL. MINAS GERAIS: Ouro Preto, Parque Estadual do Itacolomi, Estrada de Cima, 20.I.2004, fr., *V.F. Dutra et al. 167* (VIC).

Inga vulpina is restricted to Brazil, occurring in the Cerrado and Atlantic Forest domain in the states of BA, MG, ES, SP, RJ, PR, and SC (BFG 2018). In ES, the species has been collected in seasonal semideciduous forest (Fig. 16) in the Caparaó National Park, on the state border with MG.

The diagnostic characters of *I. vulpina* were discussed in the comments of *I. cabelo*. Collected with flowers in April.

Acknowledgments

The authors thank the Instituto Estadual de Meio Ambiente (IEMA) and the Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio), for the collecting permits; and the curators who helped with herbarium loans. We are also grateful to Reinaldo Pinto, for the illustrations; the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), for the Master's fellowship awarded to APC; and the Fundação de Amparo à Pesquisa e Inovação do Espírito Santo (FAPES, Process No. 61855880/2012), for financial support.

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List of additional specimens examined (specimens arranged by collector's name in alphabetic order, followed by collection number in increasing order and with the species number between parentheses).
AA Oliveira 626 (12). **AD Ferreira** 67 (20). **AD Firmino** 01 (9); 213, 311, 342, 660, 694, 707, 725, 1313, 1465, 1474, 1604 (12); 1388, 1397, 1422 (20). **AL Peixoto** 1765 (23). **AO Giaretta** 739 (9); 141 (12); 619, 1238, 1359 (20). **AM Assis** 148 (3); 861, 871 (12); 963, 2572 (18). **AM Lino** 7 (8). **AMA Amorim** 7775 (14). **AP Chagas** 58 (14). **AP Fontana** 5978 (3); 1082 (9); 4797, 5391, 8925 (17); 5153 (21). **AQ Lobão** 1512 (8); 1522 (12); 1478 (24). **BG Sossai** 147 (23). **BN Mello** 74 (20); 213 (23). **B Weinberg** 436 (12). **CC Chamas** 223, 269, 369 (21). **CN Fraga** 668, 1866 (6); 63 (12). **CV Mendonça Filho** 580 (18). **DA Folli** 467, 822, 1397, 4005, 4585, 4907, 5325 (2); 3296, 4928 (3); 3943 (4); 889 (6); 1382, 3706, 4804 (7); 3434, 4628 (8); 468, 4603, 6332 (9); 2689 (11); 1355, 3608, 3738, 5211, 5387 (12); 2503, 6356 (14); 6098 (17); 144, 1340, 2214 (18); 6049 (19); 38, 481, 1390, 4950 (20); 02, 518, 5037 (23); 5687, 6248 (25). **DR Couto** 883 (3); 737, 816 (25). **D Sucre** 4580 (9); 5557 (23). **DT Iglesias** 102 (12). **E Bausen** 133 (9). **ED Lozano** 3846, 3887 (6); 3959 (20). **EJ Lírio** 17 (21). **EJ Lucas** 813 (14); 838 (18); 838 (23). **FCO Martins** 122 (12). **FCP Garcia** 700, 707, 722 (6); 699 (7); 715 (8); 712 (9); 698, 708 (18); 701, 706 (20); 714, 718 (23); 709 (25). **F Mareto** 2 (12). **FZ Saiter** 253 (3). **G Acácio** 82 (14); 64 (25). **G Fabris** 705 (12). **G Hatschbach** 47740, 48705 (4); 68363 (12); 50703 (18); 46783 (23). **GJ Shepherd** 445 (17). **GL Farias** 149, 665 (7); 16, 17, 649, 656 (8); 645 (9); 32, 33, 42 (18); 653 (20); 655 (23). **G Martinelli** 11611 (21); 1856, 12230 (23). **GS Siqueira** 117 (2); 539 (3); 164 (4); 48 (8); 124 (9). **Garcia** HRCB 16783, HRCB 17436 (6). **HC Lima** 6651 (20); 1662, 3846 (23). **HQ Boudet Fernandes** 1529 (3), 3285, 3294, 3303 (7); 1675, 1880 (9); 1085, 1619 (20); 3433, 3442 (24). **ID Rodrigues** 325 (12); 93, 146, 176 (20). **IS Broggio** 58 (24). **I Weiler Júnior** 95 (3); 154 (12); 86, 88, 127, 240 (20); 243 (23). **J Külkamp** 1016 (7); **JA Kallunki** 339 (12). **JG Kuhlmann** 227 (25). **JH Borgo** 4 (20). **J Iganci** 256 (20). **JML Gomes** 3547, 3852 (3); 1888 (9); 1674, 1808, 3624, 3911, VIES 6586 (12); 4594 (14); VIES 12414 (17); 1875, 4323 (20); 1851 (25). **JM Simões** 108 (9). **JO Machado** 29, 123, 286 (12). **JR Pirani** 3063 (12); 204 (18); 3016 (24). **JR Stehmann** 4107 (21). **J Spada** 3, 3/77 (8); 45 (18). **LA Silva** 452 (6); 21, 111, 240, 296 (12); 608 (13); 447 (14); 561 (19); 590 (20); 460 (23); 297, 346 (25). **LD Thomaz** 1830 (3); 1007 (7); 1008, 1555, 1558 (8); 1757, VIES 14209 (21); 1559 (23). **LFS Magnago** 1006 (3); 1044, 1164, 1268, 1436 (13); 941 (20). **LFT Menezes** 2118 (18); 1701 (20). **LJC Kollmann** 726, 1635, 2437, 2506, 4987, 5634, 5946 (3); 5591, 6263 (7); 2610, 3688, 5502, 9483 (13); 1180, 8979 (14); 2047, 5469 (16); 7570, 8925 (17); 4283, 11362 (18); 3881 (19); 2223, 2484 (21); 496, 716 (22). **L Marcarini** 4, 47 (24). **MA Ferreira-Pinho** 642 (20); 645 (23). **MB Costa** 30 (9); 37 (20). **M Canal** 178, 185, 191 (12). **LM Jesus** 24 (2). **MCF Jesus** 190, SAMES 2424 (12). **MLL Martins** 138 (12). **MM Saavedra** 794 (17). **MMM Lopes** 1609 (9). **M Ribeiro** 565 (3); 31, 739 (7); 198 (9); 87, 494 (23); 299 (24). **M Simonelli** 191, 307, 323 (12); 274 (23). **M Sobral** 4030 (23). **OJ Pereira** 123, 1115, 3152, 3574, 4690, 7482 (3); 6376 (6); 5218, 4431 (7); 7665 (8); 5542, 6779 (9); 422, 2681, 3404, 3677, 4467, 4516, 4953, 5501, 5596, 6074, 7503, 7732 (12); 5949 (18); 2422, 2561, 2697, 3395, 3676, 3716, 3906, 4288, 4870, 4915, 5756, 6218, 6397, 6419, 6463, 6876 (20); 504, 3862, 3876, 4421, 4915, 5157, 5696 (23). **O Zambom** 226 (20). **PC Vinha** 946, 1240 (12); 899 (20). **P Fiaschi** 701 (3). **PHD Barros** 208 (3). **PL Krieger** 13409 (14). **PL Peterle** 8, 13, 14, 20, 26, 27, 28, 29, 36, 42 (12); 9, 16, 18, 37, 38, 39, 53 (20). **R Coelho** 2 (12). **RC Britto** 57 (21). **RC Forzza** 5438 (14); 5210 (21). **RLS Dutra** 148 (3). **RM Pizziolo** 226 (14); 28 (18). **R Nichio-Amaral** 1076 (20). **RN Oliveira** 447 (3), 464 (12). **RR Santos** 450 (21). **RR Vervloet** 1349, 1708 (3), 997, 1885 (7); 2370 (14); 804, 1075 (20); 1795, 3318 (21); 768 (22). **RT Valadares** 799 (1); 1337 (12). **TL Rocha** 83, 97 (3); 34 (20); 119 (23). **TS Santos** 1483, 1994 (4). **V Demuner** 2850 (7); 2080, 4643 (9); 2317 (13); 4301 (23); 2121 (24). **VB Sarnaglia Junior** 3 (3). **VC Freitas** 49 (20). **VD Souza** 522 (23). **VF Dutra** 832, 834 (17); 857, 858, 859, 861 (19), 860, 862, 869, 871, 872, 877, 878, 891 (20); VIES 25072 (23). **VS Miranda** 606 (23). **V Souza** 22 (12); 132, 134, 174, 385 (20). **WA Hoffmann** 49 (6); 145 (14). **W Boone** 318 (6), 191 (18). **WC Cardoso** 422 (6); 419 (25). **WO Souza** 115 (20). **W Pizziolo** 276 (21). **WP Lopes** 735 (32). **WW Thomas** 6072 (13).

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