



Original Paper

Flora of Ceará, Brasil: Passifloraceae s.s.

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Abstract

This study presents the floristic-taxonomic treatment of Passifloraceae s.s. from the state of Ceará. Identifications were based on the analysis of collections deposited in national herbaria and photos of international herbarium collections, including types specimens, specialized bibliography and samples collected in the field. The family is represented in Ceará by 18 taxa of *Passiflora*, of which three are new records for the state: *P. capsularis*, *P. kermesina* and *P. morifolia*. Ten species were registered in Conservation Units in Ceará. The species occur in various types of vegetation, but prefer more humid environments. Identification key, comments, images and distribution maps of the species are provided.

Key words: distribution, diversity, Malpighiales, passion fruit.

Resumo

Neste estudo é apresentado o tratamento florístico-taxonomico de Passifloraceae s.s. para o estado do Ceará, Brasil. As identificações foram baseadas na análise de coleções depositadas em herbários nacionais e fotos de coleções de herbários estrangeiros, incluindo espécimes tipo, bibliografias especializadas e amostras coletadas em campo. A família está representada no Ceará por 18 táxons de *Passiflora*, das quais três são novas ocorrências para o estado: *P. capsularis*, *P. kermesina* e *P. morifolia*. Dez espécies foram registradas em Unidades de Conservação do Ceará. As espécies ocorrem em vários tipos de vegetação, porém preferem ambientes mais úmidos. São fornecidas chave de identificação, comentários, imagens e mapas de distribuição das espécies.

Palavras-chave: distribuição, diversidade, Malpighiales, maracujá.

Introduction

Passifloraceae Juss. ex Roussel *sensu stricto* (currently Passifloroideae subfamily) comprises 17 genera and ca. 700 to 750 species (Feuillet & Macdougall 2007; Milward-de-Azevedo 2018). By sharing leaf glands, cyanogenic glycosides, persistent endosperm and seeds with aryls, Passifloraceae together with Turneraceae and Malesherbiaceae were positioned in the order Malpighiales, subclad Fabids, clade Rosids (APG

IV 2016). Passifloraceae s.s. is monophyletic, supostained mainly for the presence of the corona in flowers (Judd *et al.* 1999; Takuoka 2012).

In the Neotropical region, Passifloraceae is represented by four genera: *Ancistrothyrsus* Harms, *Dilkea* Mast., *Mitostemma* Mast. and *Passiflora* L., the latter, consisting of 520 species (Borges & Milward-de-Azevedo 2017). In Brazil, 161 species of Passifloraceae are recognized, with the genus *Passiflora* the most representative (153 spp.) and

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the only one registered in Ceará (BFG 2018; Flora do Brasil 2020 under construction).

Passiflora species are popularly known as passion fruit or passion flower (Millward-de-Azevedo 2008a) and are mostly characterized by vines with axillary tendrils, rarely small shrubs or trees, with alternate leaves and in a variable form, petiole generally glandular; flowers generally solitary, rare inflorescences; petals and sepals of varying colors, presence of androgynophore and filament corona and berry type fruit, rare capsule (Cervi 1997; Nunes & Queiroz 2006). The species have recognized economic importance and are frequently cultivated and can be used in culinary, for example: juice, ice cream, mousse, among others, in phytotherapy for its analgesic, sedative, antioxidant, antimicrobial and deworming properties and in ornamentation (Milward-de-Azevedo 2008a; Costa 2016; Faleiro *et al.* 2016).

In Brazil, different studies were carried out with the representatives of Passifloraceae, considering floristic and taxonomic aspects (Nunes & Queiroz 2006, 2007; Milward-de-Azevedo 2008b, 2018; Imig *et al.* 2018), anatomical characteristics (Dettke & Santos 2011; Farias *et al.* 2016), and chemical (Cavichioli *et al.* 2011; Gosmann *et al.* 2011).

Although it has an expressive representativeness in the Brazilian flora, this family is still little studied from a taxonomic and floristic point of view, mainly in the Northeast region. Specifically, in Ceará, studies focusing on Passifloraceae species are scarce and are rarely mentioned in floristic surveys (Ribeiro-Silva *et al.* 2012; Loiola *et al.* 2015; Silveira *et al.* 2020).

In addition, it is worth noting that the number of species indicated for the flora of Ceará (BFG 2018; Flora do Brasil 2020 under construction) is incomplete. Recent studies linked to the “Flora of Ceará Project: knowing to conserve” have shown how much the floristic diversity of that state is underestimated, confirmed with quotes from new records (Capistrano & Loiola 2015; Tabosa *et al.* 2016; Rocha *et al.* 2018; Lima *et al.* 2018, 2020; Sampaio *et al.* 2019a) or description of new species (Loiola 2013; Souza *et al.* 2016; Sampaio *et al.* 2016, 2019b; Ribeiro *et al.* 2017).

The present study aimed to carry out the floristic-taxonomic survey of the Passifloraceae *sensu stricto* family in Ceará, aiming to know the richness, the geographical distribution and the use of the species that occur in the Brazilian state of Ceará.

Material and Methods

Field expeditions were carried out in 18 from March/2019 to March/2020. The preliminary list of species was based on information from the Flora do Brasil 2020 platform (BFG 2018; Flora do Brasil 2020 under construction). Visits were made at national herbaria (EAC, HCDAL, HST, HUVA, IPA, PEUFR, UEC, UFP), as well as material analysis, including collections-types, examination of virtual herbarium specimens from Brazil (ALCB, ASE, CEN, CEPEC, EAN, ESA, GFJP, HB, HUEFS, HVASF, ICN, MBM, PEL, RB) and abroad (K, MO, NY, US), whose acronyms are in accordance with Thiers (continuously updated) and Sérgio Tavares herbarium - HST (not indexed). For the confirmation of the names of the authors of the taxa, the IPNI (2020) was consulted.

Species identifications were based on morphological characteristics, through analysis of specimens reviewed by specialists, including collections-types, use of a stereomicroscope for better visualization of botanical material and specialized bibliographies (Nunes & Queiroz 2001; Bernacci 2003; Costa *et al.* 2015; Costa & Melo 2016). The data about the habit, phenology, common name, type of vegetation, geographic coordinates and potential for use were obtained during field expeditions and the labels of the specimens.

The description of morphological characters of the Passifloraceae followed the terminology proposed by Harris & Harris (2001) and Gonçalves & Lorenzi (2011) and the description of the fruits was based on Spjut (1994). The descriptions of the genus and species came from the analysis of samples collected in the state of Ceará; however, when the data were insufficient, the descriptions were supplemented with botanical material collected in other states.

The geographic distribution of the species was classified as restricted, when registered between one and five municipalities; moderate, between six and ten municipalities, and broad, in more than ten municipalities (Valente & Porto 2006; Rebouças *et al.* 2019). The geographic distribution map of the species was prepared using the Qgis Software version 3.6 and it was based on Rebouças *et al.* (2020), adopting the system of half-grade grid squares and the registration of a collection of the species by municipality.

The registration of specimens without indication of coordinates was georeferenced using the coordinates of the municipality obtained with

the “geoLoc” tool (CRIA 2020). The vegetation types where the species occur are in accordance with Figueiredo (1997) and Technical Manual of Brazilian Vegetation (IBGE 2012).

Results and Discussion

In Ceará, Passifloraceae s.s. is represented by 18 taxa, three of which are new records (Tab. 1). According to Re flora - Virtual Herbarium (2020) for Ceará, the following species are recognized: *P. caerulea* L., *P. cisanana* Harms, *P. coccinea* Aubl., *P. foetida* var. *muralis* (Barb. Rodr.), *P. galbana* Mast., *P. mucronata* Lam., *P. racemosa* Brot. and *P. rubra* L.; however, after analyzing the collections, it was found that correspond respectively to *P. cincinnata*, *P. capsularis*, *P. glandulosa*, *P. foetida* var. *foetida*, *P. silvestris*, *P. silvestris*, *P. glandulosa* and *P. capsularis*.

The *Passiflora* genus is relatively well represented in Ceará, where 27.86% (18) of the 61 registered taxa for the Northeast region of Brazil occur. It is important to highlight that 61.11% (11) of the registered taxa have a restricted distribution; therefore, it is necessary to study the conservation of areas where these species occur. *Passiflora subrotunda* has a restricted distribution to northeastern Brazil, *P. transversalis* has disjunct distribution in Brazil, in the Northeast region it has occurrence only in Ceará state and *P. capsularis*, *P. kermesina* and *P. morifolia* are new records for Ceará territory.

The *Passiflora* representatives occur in the most varied types of vegetation: Vegetation Complex of the Coastal Zone (Vegetação Psamófila Pioneira/Florestas à Retaguarda das Dunas/Floresta Estacional Semidecidual de Terras Baixas - Mata de Tabuleiro), Seasonal Semideciduous Forest (Mata Seca), Dense Ombrophylous Forest (Mata Úmida), Savanna (Cerrado), Florested Savanna (Cerradão), Stepic Savanna (Caatinga/Carrasco), Arboreous Stepic Savanna (Caatinga Arbórea) and Vegetation under Fluvial and/or Lacustrine Influence (Mata Ciliar). 77,77% (14) taxa were registered in Dense Ombrophylous Forest (Mata Úmida).

Regarding the amplitude of occurrence, 11 taxa were restricted in distribution, three were moderate in distribution and four were broad in distribution (Tab. 1). Ten species 55,55% (10) occur in ten Conservation Units in Ceará (Tab. 1). Thus, there is a need for greater effort to carry out collections, as well as studies aimed at the conservation of this group in Ceará' territory.

About the use, some species can be used in feeding (*P. alata*, *P. cincinnata*, *P. edulis* and *P. laurifolia*), ornamentation (*P. alata*, *P. capsularis* and *P. cincinnata*) and phytotherapy (*P. alata*, *P. cincinnata*, *P. edulis* and *P. foetida*). *Passiflora edulis* stood out for its economic value, being cultivated for commercial purposes.

Taxonomic treatment

Passiflora L., Sp. pl. 2: 955. 1753.

Vines herbaceous or woody, with tendrils. Stem cylindrical, rarely angular, quadrangular or flattened. Stipules usually persistent, linear, ovate-oblong, lanceolate, semi-ovate, ovate or ovate-lanceolate, rarely pinnatisect. Petioles glabrous, pubescent, rare hirsute, usually glandular, from two to five glands, sessile or stipitate, rare orbicular, green, rarely orange, usually at the median region of petiole. Leaf blade simple or compound, entire, 2–5 lobed, central lobe sometimes atrophied, or 3–5 leaflets, sometimes presents polymorphism in the same individual, usually membranaceous, rare chartaceous or coriaceous, margin entire or undulate, abaxial surface sometimes purple, rarely ocelli present, when they are presents, 2–15 ocelli along the leaf blade Pedicel usually glabrous; bracts oblong-ovate, oblong, ovate, linear, elliptical or oval-lanceolate, rarely pinnatisect, falciform or absent, usually sessile, rarely petiolate, usually persistent, usually glabrous, rare pubescent or tomentose. Flowers solitary, rare inflorescence biflorous, calyx tube campanulate or cylindrical-campanulate, rare cilindric or patelliform; sepals oblong, linear or oblong-lanceolate, apex obtuse, acute or rounded, usually with a horn, membranaceous or thick; petals oblong, linear, oblong-lanceolate or lanceolate, usually membranaceous, rare tick or absent, purple, green, lilac-purplish, lilac, white, pink or red; filaments of the corona arranged from one to six series, white, purple, green, green-yellowish or mixture of the colors, purple and white, purple, lilac and white, purple, white and blue, red, white, lilac, blue and purple, green-purplish; nectariferous ring usually present; anthers five, stigmas three, ovary oblong, elliptical, globose, elliptical-ovoid or ovoid. Fruit usually berry, rare capsule, globose, ellipsoid, ovoid, rare pyriform, glabrous, pubescent, rare with hispid and thickened trichomes, pericarp smooth or 6-costate, green, yellow, orange, red, purple or black when mature, white ocelli sometimes present; seeds oblong-ovate, ovate, oblong, elliptical or oblong-cordate, alveolate, foveolate or transversally sulcate, rarely reticulate.

Table 1 – List of *Passiflora* species found in the Ceará state, with new records (NR); occurrence in Conservation Units (UC): Environmental Protection Area (APA), Ecological Station (EE), National Park (PARNA), Private Natural Heritage Reserve (RPPN); vegetation types; range of distribution (AC).

Species	NR	UC	Vegetation types	AC
<i>Passiflora alata</i>	–	–	Dense Ombrophilous Forest	Restricted
<i>Passiflora capsularis</i>	X	–	Dense Ombrophilous Forest, Arboreous Savanna, Arboreous Savanna, Arboreous Stepic Savanna Semideciduous Seasonal Forest	Moderate
<i>Passiflora castellanosii</i>	–	PARNA Ubajara	Dense Ombrophilous Forest	Restricted
<i>Passiflora cincinnata</i>	–	Floresta Nacional do Araripe-Apodi National Forest, RPPN Serra das Almas, EE de Aiuaba	Vegetation Complex of the Coastal Zone, Semideciduous Seasonal Forest, Dense Ombrophilous Forest, Savanna, Arboreous Savanna, Arboreous Stepic Savanna, Vegetation under Fluvial and/ or Lacustrine Influence	Broad
<i>Passiflora edulis</i>	–	–	Vegetation Complex of the Coastal Zone, Semideciduous Seasonal Forest, Dense Ombrophilous Forest, Arboreous Savanna, Arboreous Stepic Savanna	Broad
<i>Passiflora foetida</i> var. <i>foetida</i>	–	RPPN Serra das Almas, EE de Aiuaba, APA de Jericoacoara, RPPN Fancy Nunes, APA da Redonda	Vegetation Complex of the Coastal Zone, Dense Ombrophilous Forest, Arboreous Savanna, Arboreous Stepic Savanna, Vegetation under Fluvial and/ or Lacustrine Influence	Broad
<i>Passiflora glandulosa</i>	–	PARNA Ubajara	Dense Ombrophilous Forest, Savanna	Moderate
<i>Passiflora kermesina</i>	X	–	Dense Ombrophilous Forest, Arboreous Savanna	Restricted
<i>Passiflora laurifolia</i>	–	Floresta Nacional do Araripe-Apodi National Forest, PARNA Ubajara	Dense Ombrophilous Forest, Arboreous Stepic Savanna	Moderate
<i>Passiflora misera</i>	–	–	Dense Ombrophilous Forest, Semideciduous Seasonal Forest	Restricted
<i>Passiflora morifolia</i>	X	–	Semideciduous Seasonal Forest	Restricted
<i>Passiflora picturata</i>	–	Floresta Nacional do Araripe-Apodi National Forest	Vegetation Complex of the Coastal Zone, Semideciduous Seasonal Forest	Restricted
<i>Passiflora silvestris</i>	–	Floresta Nacional do Araripe-Apodi National Forest	Vegetation Complex of the Coastal Zone, Semideciduous Seasonal Forest, Arboreous Savanna, Arboreous Stepic Savanna	Restricted
<i>Passiflora suberosa</i>	–	–	Semideciduous Seasonal Forest, Dense Ombrophilous Forest	Restricted
<i>Passiflora suberosa</i> subsp. <i>litoralis</i>	–	–	Semideciduous Seasonal Forest, Dense Ombrophilous Forest, Arboreous Stepic Savanna	Restricted

Species	NR UC	Vegetation types	AC
<i>Passiflora subrotunda</i>	– APA Lagamar do Cauípe, APA do Rio Pacoti, APA de Jericoacoara, APA de Ponta Grossa	Vegetation Complex of the Coastal Zone	Broad
<i>Passiflora transversalis</i>	– PARNA Ubajara	Dense Ombrophilous Forest	Restricted
<i>Passiflora tricuspid</i>	PARNA Ubajara Floresta Nacional do Araripe- Apodi National Forest	Dense Ombrophilous Forest, Arboreous Savanna	Restricted

Key to the Ceará species of *Passiflora* (Passifloraceae)

1. Vines herbaceous.
 2. Petioles glandular.
 3. Leaves chartaceous.....13. *Passiflora silvestris*
 - 3'. Leaves membranaceous.
 4. Stipules pinnatisect.....6. *Passiflora foetida*
 - 4'. Stipules entire.
 5. Stipules linear; inflorescence biflorous.
 6. Calyx tube campanulate; filaments of the corona arranged into two series green-yellowish14. *Passiflora suberosa*
 - 6'. Calyx tube patelliform; filaments of the corona arranged into two series, internal serie purple and external serie green-purplish..... 14.1. *Passiflora suberosa* subsp. *litoralis*
 - 5'. Stipules lanceolate, ovate-oblong or semi-ovate; flowers solitary.
 7. Sepals thick, apex acute, with a horn3. *Passiflora castellanosii*
 - 7'. Sepals membranaceous, apex obtuse, without horn.
 8. Berry ellipsoid, pericarp smooth 8. *Passiflora kermesina*
 - 8'. Berry ovoid, pericarp with hispid and thickened trichomes 11. *Passiflora morifolia*
 - 2'. Petiole non-glandular.
 9. Stipules persistent; sepals and petals oblong.
 10. Stem cylindrical; leaves without ocelli; fruit capsule 2. *Passiflora capsularis*
 - 10'. Stem flattened; leaves with two ocelli at the base and 13–15 along the leaf blade; fruit berry 17. *Passiflora tricuspid*
 - 9'. Stipules caducous; sepals and petals lanceolate or oblong-lanceolate.
 11. Stipules, petioles and berry glabrous; ovary elliptical 10. *Passiflora misera*
 - 11'. Stipules, petioles and berry pubescent; ovary oblong 16. *Passiflora transversalis*
- 1'. Vines woody.
 12. Stem quadrangular; petals thick1. *Passiflora alata*
 - 12'. Stem cylindrical; petals membranaceous.
 13. Petiole with stipitate glands.
 14. Leaves with abaxial surface purple; bracts with base petiolate, caducous; petals pink.. 12. *Passiflora picturata*
 - 14'. Leaves with abaxial surface green; bracts with base sessile, persistent; petals purple 15. *Passiflora subrotunda*
 - 13'. Petiole with sessile glands.
 15. Bracts glabrous; berry with ocelli.
 16. Leaf margin serrate; sepals membranaceous; petals white 5. *Passiflora edulis*
 - 16'. Leaf margin entire; sepals thick, petals pink 7. *Passiflora glandulosa*
 - 15'. Bracts pubescent; berry whitout ocelli.

17. Leaf blade entire; calyx tube campanulate; petals lilac4. *Passiflora cincinnata*
 17'. Leaf blade 2–5 lobed or 3–5 leaflets; calyx tube cylindrical-campanulate; petals red
9. *Passiflora laurifolia*

1. *Passiflora alata* Curtis, Bot. Mag. 2: t. 66. 1788. Figs. 1; 2a-d

Vine woody. Stem quadrangular, striate, glabrous. Stipules 0.3–0.5 cm long, persistent, linear, glabrous, apex acute, margin entire, non-glandular. Petioles 1–4 cm long, glabrous, with a pair of glands orbicular near the apex, orange. Leaf blade 7.2–11.9 × 3.7–8 cm, simple, entire, ovate, chartaceous, glabrous, apex acute or acuminate, base cuneate, margin entire, glandular, penninerved, ocelli absent. Pedicel 2.7–3.2 cm long, glabrous; bracts 4–4.4 × 2.6–2.9 cm, oblong-ovate, apex obtuse or rounded, base obtuse, sessile, margin entire, persistent, glabrous, glands absent. Flowers 7.9–8.2 cm diam., solitary, calyx tube campanulate; sepals 3.1–4.2 × 0.9–1.2 cm, oblong, apex obtuse, with a horn, thick, glabrous, adaxial surface purple, abaxial surface green; petals 3.3–3.6

× 1–1.2 cm, oblong, apex obtuse or rounded, thick, adaxial and abaxial surface purple; filaments of the corona arranged into four series, external serie 2.8–5.9 cm long, internal serie 0.2–0.5 cm long mixture of the colors white, purple and lilac; nectariferous ring present; androgynophore 0.8–1.3 cm long; filaments 0.4–0.5 cm long, yellow, anthers ca. 0.7 cm long, styles 0.5–0.6 cm long, yellow, stigma ca. 0.3 cm long; ovary 0.6–0.7 × 0.2–0.3 cm, oblong, glabrous. Berry 5.7–6.7 × 3.8–4.3 cm, pyriform, pericarp smooth, glabrous, yellow when mature, ocelli absent; seeds 0.6–0.8 × 0.4–0.5 cm, cordate, alveolate.

Examined material: Pacatuba, Sítio Retiro, 27.XI.2005, fr., *A.S.F. Castro 1639* (EAC).

Additional material examined: BRAZIL. BAHIA: Cairú, Rodovia Nelo Peçanha, 9.XII.1980, fl., *A.M. Carvalho et al. 393* (CEPEC); Chapada Diamantina,

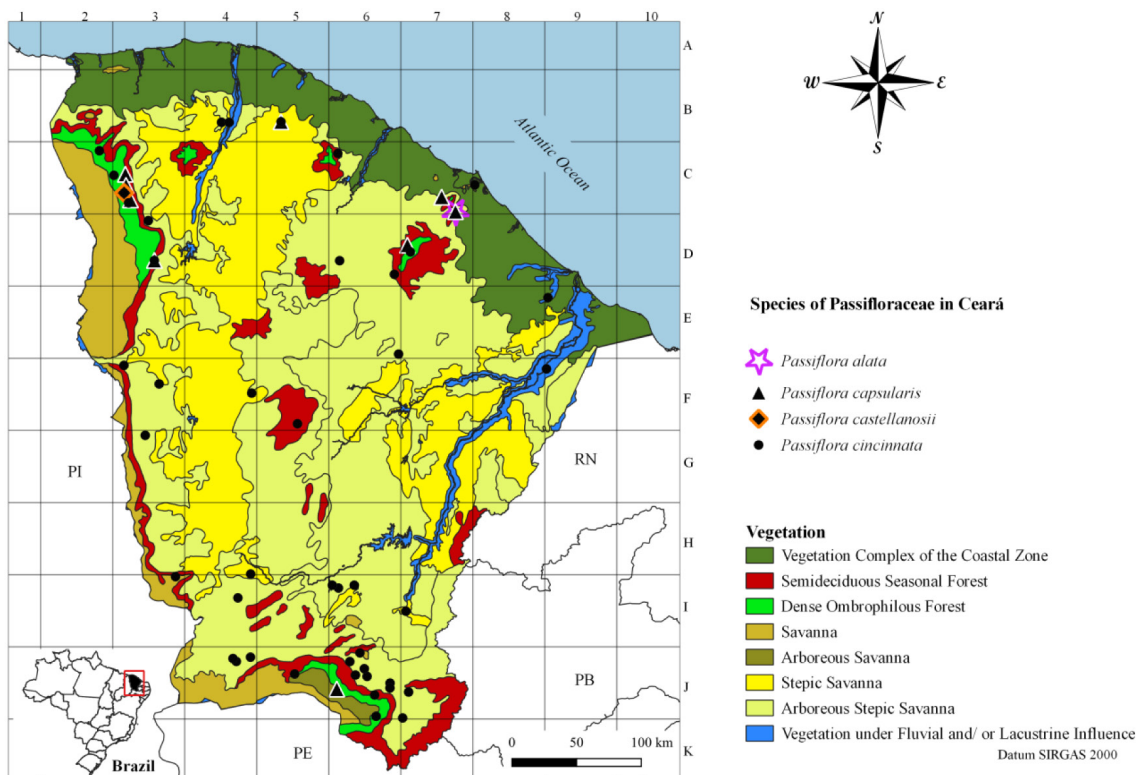


Figure 1 – Distribution of *Passiflora alata*, *P. capsularis*, *P. castellanosii* and *P. cincinnata* in Ceará, Northeast Brazil. Source: Rebouças et al. (2020).

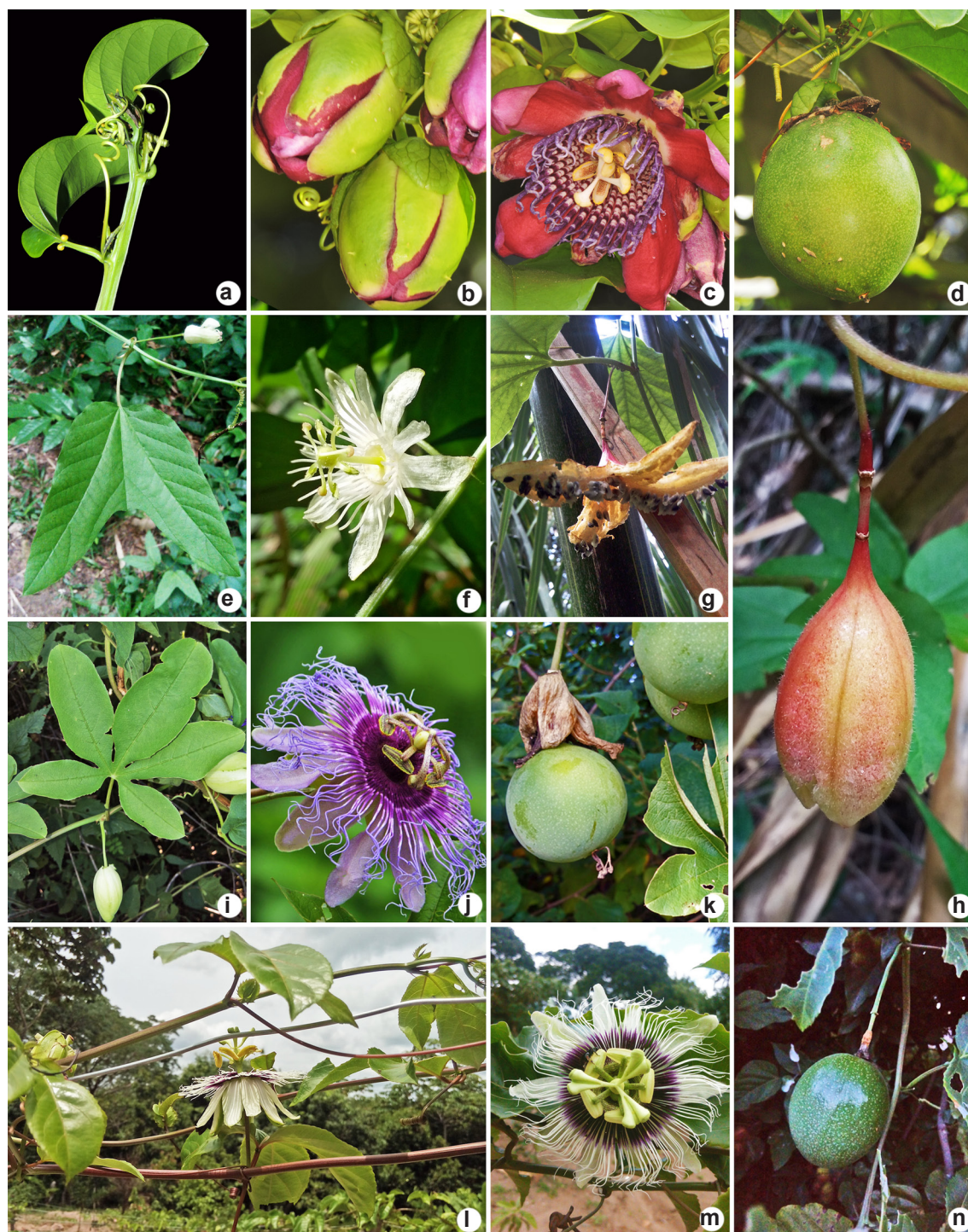


Figure 2 – a-n. *Passiflora* in Ceará state, Northeast Brazil – a-d. *Passiflora alata* – a. leaf (adaxial surface); b. buds; c. flower; d. fruit; e-h. *P. capsularis* – e. leaf (adaxial surface); f. flower; g. dehiscence of fruit; h. fruit; i-k. *P. cincinnata* – i. leaf (adaxial surface) and bud; j. flower; k. fruit; l-n. *P. edulis* – l. habit and details of the leaves, bud and flower; m. flower; n. fruit. (a-d. RT Queiroz; j. André Neto).

caminho para Fazendola, Rio de Contas, 13°34'S, 41°48'W, 7.VII.2012, fl., *M.L. Guedes et al. 19842* (ALCB). Conde, Fazenda do Bu, 12°03'58"S, 37°43'28"W, 12.XII.1995, fl., *J. Costa et al. 02* (HUEFS, HRB). Mucuri, 18°04'42"S, 39°39'30"W, 22.XI.2018, fr., *G. Martinelli 20532* (RB). Porto Seguro, Fazenda Bom Sossego, 16°22'22"S, 39°05'19"W, 14.VI.2002, fl., *L.P. Almeida et al. 127* (CEN).

Passiflora alata distinguished from the others species occurring in Ceará by the quadrangular stem with two orange glands near the apex of petioles, large diameter flower (7.9–8.2 cm), purple petals, filaments of the corona arranged into four series mixture of the colors white, purple and lilac and pyriform berry.

Species endemic to Brazil, with confirmed occurrence in the all regions, in the Amazon, Cerrado and Atlantic Forest phytogeographic domains (BFG 2018; Flora do Brasil 2020 under construction). *Passiflora alata* has restricted distribution and it was considered rare in Ceará, being recorded only in the municipality of Pacatuba, in the Dense Ombrophilous Forest (Mata Úmida) (Fig. 1).

It has commercial value, because its fruits can be consumed *in natura* and it has ornamental potential by the beauty its of the branches and flowers (Cervi 1997; Braga *et al.* 2005).

This species is collected only with fruits in November.

Popular name: maracujá.

2. *Passiflora capsularis* L., Sp. Pl. 2: 957. 1753.

Figs. 1; 2e-h

Vine herbaceous. Stem cylindrical, striate, pubescent. Stipules 0.6–1 cm long, persistent, linear, glabrous, apex acute, margin entire, glandular. Petioles 0.9–4.7 cm long, pubescent, non-glandular. Leaf blade 3–6.8 × 5–8.8 cm, simple, 2–3 lobed with central lobe atrophied, ovate-cordate, central lobe 0.2–1 × 1.9–2.5 cm, lateral lobes 4.8–10.2 × 2.2–6.7 cm, membranaceous, pubescent, apex central lobe sometimes acuminate, apex lateral lobes rounded, base subcordate to cordate, margin entire to undulate, 3-nerved, glands absent, ocelli absent. Pedicel 4.2–5.2 cm long, pubescent; bracts absent. Flowers 2.6–3 cm diam., solitary, calyx tube campanulate; sepals 1.2–1.5 × 0.2–0.3 cm, oblong, apex obtuse, with a horn, thick, glabrous, adaxial and abaxial surface white; petals 1.1–1.3 × 0.2–0.3 cm, oblong, apex acute, membranaceous, adaxial and abaxial surface white; filaments of the corona arranged into one serie 0.6–0.9 cm long, white; nectariferous ring present; androgynophore

0.6–0.7 cm long; filaments 0.4–0.5 cm long, green, anthers ca. 0.4 cm long, styles 0.2–0.4 cm long, green, stigma ca. 0.1 cm long; ovary 0.2–0.3 × ca. 0.1 cm, elliptical, glabrous. Capsule 2.5–3.8 × 1.5–2 cm, ellipsoid, 6-costate, pubescent, red when mature, ocelli absent; seeds 0.3–0.4 × ca. 0.2 cm, oblong-ovate, reticulate.

Examined material: Crato, trilha do Granjeiro, 07°16'51"S, 39°26'20"W, 10.II.2020, fl. and fr., *F.G.L.S. Souza & A.B. Tavares 43* (HCDAL). Guaramiranga, estrada para o Pico Alto, 04°21'66"S, 38°95'40"W, 24.IV.2010, fl. and fr., *M. Milward-de-Azevedo & D.J.L. Souza 206* (UEC). Ibiapina, beira de estrada, 03°90'29"S, 40°87'69"W, 17.IV.2010, fl. and fr., *M. Milward-de-Azevedo & D.J.L. Souza 176* (UEC). Itapipoca, maciço de Uruburetama, serra de Itacoatiara, 20.XII.2014, fl. and fr., *F.D.S. Santos 159* (HUVA). Ipu, distrito Ingazeira, Sítio Coqueiros, 04°32'22"S, 40°71'08"W, 28.II.2019, fl. and fr., *I.B.S. Nascimento & A.L.S. Sales 360* (HUVA). Maranguape, Serra de Maranguape, 3°88'33"S, 38°71'66"W, 23.IV.2010, *M. Milward-de-Azevedo & D.J.L. Souza 196* (UEC). Pacatuba, encosta alta da Serra de Pacatuba, 16.II.1960, fl., *A. Lima 68-5271* (IPA). Tianguá, Sítio Aninga, 03°72'48"S, 40°91'20"W, 19.IV.2010, fr., *M. Milward-de-Azevedo & D.J.L. Souza 188* (UEC). Ubajara, Sítio São Luís, 03°80'19"S, 40°90'75"W, 20.I.2016, fl., *E.B. Souza et al. 3757* (EAC, HUVA).

Passiflora capsularis is characterized by the ovate-cordate leaves, 2–3 lobed with central lobe atrophied, bracts absent, white flowers, filaments of the corona arranged into one serie, white and ellipsoid capsule, 6-costate, red when mature, being this type of fruit an exclusive characteristic this species among the others species registered in Ceará.

It occurs in Mexico, Central America, Columbia, Ecuador, Brazil, Paraguay, Argentina, and Uruguay (Milward-de-Azevedo *et al.* 2012). It has distribution in the all regions of Brazil (BFG 2018; Flora do Brasil 2020 under construction). In Northeast Brazil it was registered in the states of Piauí and Bahia, therefore, it is new occurrence in Ceará. *Passiflora capsularis* has moderate distribution in Ceará territory and occurs in nine municipalities. It was recorded in the Dense Ombrophilous Forest (Mata Úmida), Stepic Savanna (Caatinga/Carrasco), Florested Savanna Cerradão, Arboreous Stepic Savanna (Caatinga Arborea) and Semideciduous Seasonal Forest (Mata Seca) (Fig. 1), at altitudes between 730–733 m.

This species can be used in genetic breeding programs, for the production of hybrids, because its small flowers, branches and fruits with colors

and shapes can be harnessed for the ornamentation (Amorim *et al.* 2011).

This species flowers in January, February, April and December and fruits in February, April, May and December.

Popular names: maracujá, maracujá de cobra.

3. *Passiflora castellanosii* Sacco, Bradea 1(32): 346. 1973. Fig. 1

Vine herbaceous. Stem cylindrical, striate, glabrous. Stipules 2.7–3.2 × 1–1.4 cm, persistent, ovate-oblong, entire, glabrous, apex rounded, mucronate, margin entire, non-glandular. Petioles 1.7–3.9 cm long, glabrous, with two to three pair of glands stipitate at the median region of petiole, green. Leaf blade 3–3.5 × 1.8–2.2 cm simple, entire, oblong or ovate, or 4.6–5.5 × 4.2–5.7 cm, simple, 3-lobed, central lobe 2.6–3.1 × 1.2–2.2 cm, lateral lobes 3.8–4.3 × 1.9–2.4 cm, sometimes presents polymorphism in the same individual, lobes oblong or ovate, membranaceous, glabrous, apex obtuse, sometimes mucronate, base obtuse, sessile, margin entire, glandular, penninerved or 3-nerved, ocelli absent. Pedicel 5.7–7.7 cm long, glabrous; bracts 3.2–3.7 × 1.8–2.1 cm, ovate, apex rounded, mucronate, base truncate, sessile, margin entire, persistent, glabrous, glands absent. Flowers 3.1–4 cm diam., solitary, calyx tube campanulate; sepals 1.2–2 × 0.6–0.8 cm, linear, apex acute, with a horn, thick, glabrous, adaxial surface lilac-purplish, abaxial surface green; petals 1.2–2 × 0.6–0.8 cm, linear, apex obtuse, membranaceous, adaxial surface lilac -purplish, abaxial surface white; filaments of the corona arranged into three series, external serie 0.3–0.6 cm long, median serie 0.6–1.1 cm long, internal serie 0.3–0.5 cm long, mixture of the colors purple and white; nectariferous ring present; androgynophore 1–1.1 cm long, filaments 0.6–0.7 cm long, green, anthers 0.4–0.5 cm long, styles 0.5–0.7 cm long, green, stigma 0.1–0.2 cm long; ovary 0.5–0.7 × 0.3–0.4 cm, elliptical, glabrous. Fruit not seen.

Examined material: Ubajara, Parque Nacional de Ubajara, no caminho da Gruta de Ubajara, 27.I.1968, fl., Z. Trinta *et al.* 1322 (RB, PEL).

Additional material examined: BRAZIL. MATO GROSSO: km 267 da estrada Xavantina-Cachimbo, 24.XI.1967, fl., D. Philcox 3232 (K); km 274 da estrada Xavantina-Cachimbo, 18.XI.1977, fl., D. Philcox 3121 (K).

Passiflora castellanosii is recognized by having ovate-oblong stipules, simple leaf blade, entire, oblong or ovate, or 3-lobed, lobes oblong or ovate, sepals and petals linear, with adaxial surface

lilac-purplish. This species can be confused with *P. kermesina* and *P. picturata*, being distinguished by *P. castellanosii* by having ovate-oblong stipules (*vs.* lanceolate; ovate), obtuse base of the leaf (*vs.* truncate; subcordate), entire margin of the leaf (*vs.* denticulate; undulate), truncate base of the bracts (*vs.* obtuse; rounded).

Species endemic to Brazil, it was registered in the states of Ceará and Mato Grosso, in the Cerrado and Caatinga phytogeographic domains (BFG 2018; Flora do Brasil 2020 under construction). This species has restricted distribution, and it was considered rare in Ceará, with confirmed occurrence only in the municipality of Ubajara, in the Dense Ombrophilous Forest (Mata Úmida) (Fig. 1). It occurs in one Conservation Unit of Ceará State: Ubajara National Park.

This species flowers in January.

4. *Passiflora cincinnata* Mast., Gard. Chron. 37: 966. 1868. Figs. 1; 2i-k

Vine woody. Stem cylindrical, striate, pubescent. Stipules 0.7–1.6 cm long, persistent, linear, glabrous, apex acute, margin entire to slightly serrate, non-glandular. Petioles 1.3–5.9 cm long, glabrous, with a pair of glands sessile near the base, green. Leaf blade 2.8–13.2 × 4–17.3 cm, simple, 3–5 lobed, lobes elliptical or oblong, central lobe 2.8–13.2 × 1.1–5.3 cm, lateral lobes 2.5–11.8 × 1–5.1 cm or 4.1–7.2 × 6.5–9.2 cm, compound, 3–5 leaflets, leaflets elliptical or oblong, central leaflet 3.4–7.2 × 1.1–2.4 cm, lateral leaflets 3.4–6.7 × 1–2.1 cm, sometimes presents polymorphism in the same individual, membranaceous to chartaceous, adaxial surface glabrous, sometimes presents trichomes on veins, abaxial surface glabrous, apex acute or rounded, sometimes mucronate, base obtuse to truncate, margin crenate or serrate, glandular, 3–5 nerved, ocelli absent. Pedicel 1.3–9.2 cm long, glabrous to pubescent; bracts 2.2–4 × 1.4–3 cm, oblong, apex acute or rounded, base obtuse, sessile, glandular, margin entire, persistent, pubescent. Flowers 6.5–10.5 cm diam., solitary, calyx tube campanulate; sepals 1.2–4.3 × 1.3–2 cm, oblong, apex acute, with a horn, membranaceous, glabrous, adaxial surface lilac, abaxial surface green; petals 3–4.5 × 1–1.8 cm, oblong, apex obtuse or rounded, membranaceous, adaxial and abaxial surface lilac; filaments of the corona arranged into three series, external serie 3.9–4.5 cm long, median serie 3.8–4.7 cm long, internal serie 0.5–0.7 cm long, mixture of the colors purple, lilac and white; nectariferous ring present;

androgynophore 0.6–1.4 cm comp.; filaments 0.9–1 cm long, with purple spots, anthers 1.1–1.2 cm long, styles 1.2–1.3 cm long, with purple spots, stigma 1.1–1.2 cm long; ovary 0.3–0.4 × 0.2–0.3 cm, globose, glabrous. Berry 3.9–4.5 cm diam., globose, pericarp smooth, glabrous, green, ocelli absent; seeds 0.4–0.6 × 0.2–0.3 cm, ovate, alveolate.

Examined material: Abaiara, Sítio Livramento, 07°19'57"S, 39°31'49"W, 7.VII.2019, fr., *F.G.L.S. Souza & V.S. Januário 34* (HCDAL). Aiuaba, Serra Bonita, E.E.A., 19.III.1991, fl. and fr., *M.A. Figueiredo et al. 39* (EAC). Altaneira, Sítio Serra do Valério, 06°59'25"S, 39°43'27"W, 15.VI.2019, fr., *F.G.L.S. Souza & M.G.L. Sampaio 16* (HCDAL). Antonina do Norte, Sítio Macambira, 06°49'55"S, 40°04'22"W, 15.VI.2019, fl., *F.G.L.S. Souza & M.G.L. Sampaio 21* (HCDAL). Aracati, Aroeiras, Fazenda Recordações, 04°57'97"S, 37°97'86"W, 24.III.2019, fl. and fr., *M.I.B. Loiola & M.A. Loiola 2815* (EAC). Araripe, Sítio Tanquinho, 07°10'15"S, 40°14'15"W, 16.VI.2019, fr., *F.G.L.S. Souza & M.G.L. Sampaio 28* (HCDAL). Aratuba, Sítio Chave, 18.X.1979, fl., *E. Nunes & A.J. Castro* (EAC 7133). Assaré, Sítio São José, 06°57'30"S, 39°47'56"W, 15.VI.2019, fl., *F.G.L.S. Souza & M.G.L. Sampaio 18* (HCDAL). Barbalha, Malhada Bonita, 7.XII.2011, fl., *A.C.B. Santos* (HCDAL 7000). Brejo Santo, entre Brejo Santo e Penaforte, Sítio Balança, 14.II.1986, fl., *A. Fernandes & Matos* (EAC 14011). Campos Sales, distrito Carmelópolis, Sítio Lagoa Coberta, 06°51'38"S, 40°56'39"W, 16.VI.2019, fr., *F.G.L.S. Souza & M.G.L. Sampaio 23* (HCDAL). Caririáçu, Boneco, 16.I.2008, fl., *A.C.A. Morais 03* (HCDAL). Crateús, Reserva Particular do Patrimônio Natural Serra das Almas, 8.V.2002, fl., *F.S. Araújo & L.C. Girão 1480* (EAC). Crato, estrada para o bairro Granjeiro, 07°15'17"S, 39°25'35"W, 6.VI.2019, fl., *F.G.L.S. Souza 11* (HCDAL). Farias Brito, Sítio Lambedouro, 06°57'33"S, 39°32'31"W, 15.VI.2019, fr., *F.G.L.S. Souza & M.G.L. Sampaio 14* (HCDAL). Fortaleza, Cidade dos Funcionários, 4.XII.1993, fl. and fr., *I.M.B. Sá 138* (EAC). Graça, Sítio Santa Clara, 5.II.2016, fr., *F.F. Araújo 57* (HUVA). Guaramiranga, quase do topo do Pico Alto, na beira da estrada, 11.II.2009, fr., *M.F. Moro 711* (EAC). Ibiapaba, Serra de Ibiapaba, 7.I.1942, fl., *P. Bezerra* (EAC 476). Ibiapina, 3.V.1995, fl., *C.A.O. Alves 94* (HUVA). Ipu, Ibiapaba Norte, 21.V.1997, fl., *M.A. Figueiredo & J. Augusto* (EAC 25819). Itapipoca, maciço de Uruburetama, Serra de Itacoatiara, 20.VII.2014, fl., *F.D.S. Santos 150* (HUVA). Jardim, Sítio Gravata, 07°33'40"S, 39°18'20"W, 12.III.2019, fl. and fr., *F.G.L.S. Souza & J.W.A. Bezerra 2* (HCDAL). Juazeiro do Norte, Sítio Taquari, 07°48'15"S, 39°17'13"W, 18.IV.2019, fl., *F.G.L.S. Souza & K.S. Januário 8* (HCDAL). Lavras da Mangabeira, Serra do Boqueirão, 24.III.2018, fl. and fr., *J.T. Calixto Júnior et al. 13526* (HCDAL). Meruoca, Serra de Meruoca, Santo gostinho de Melo,

03°36'50"S, 40°24'44"W, 27.IV.2019, fl., *M.I.B. Loiola & J. André Neto 2825* (EAC). Milagres, Sítio Nazaré, 07°31'33"S, 38°94'56"W, 7.VII.2019, fr., *F.G.L.S. Souza & V.S. Januário 36* (HCDAL). Missão Velha, Sítio Pinheira, 07°25'14"S, 39°07'45"W, 26.III.2019, fl. and fr., *F.G.L.S. Souza 6* (HCDAL). Nova Olinda, Sítio Zabelê, 07°10'24"S, 39°35'37"W, 14.II.2013, fl., *A.B.M. Lima-Neto* (HCDAL 9982). Novo Oriente, Baixa Fria, Planalto do Ibiapaba, 4.V.1991, fl., *F.S. Araújo 418* (EAC). Pedra Branca, 25.V.2000, fl. (HUVA 4610). Porteiras, estrada que liga Porteiras a Jamacaru, 07°28'55"S, 39°07'52"W, 8.III.2020, fl., *F.G.L.S. Souza & Neves, I.C.S. 64* (HCDAL). Potengi, Sítio Barreira da Ema, 07°07'18"S, 40°04'35"W, 16.VI.2019, fl., *F.G.L.S. Souza & M.G.L. Sampaio 31* (HCDAL). Quixadá, Serra do Estêvão, 28.XI.1984, fl., *F. Cavalcanti* (EAC 12901). Quixeré, Distrito Quixeré, Chapada do Apodi, 05°07'42"S, 37°98'86"W, 13.V.1997, fl., *L.M.R. Melo & O.M. Gomes 58* (UEC). Salitre, Sítio Jacarandá, 07°08'14"S, 40°16'49"W, 16.VI.2019, fl., *F.G.L.S. Souza & M.G.L. Sampaio 25* (HCDAL). Santa Quitéria, 10,2 km SSW (em linha reta) de Itatira, 04°32'41"S, 39°42'47"W, 29.IV.2012, fr., *J. Paula-Souza et al. 11119* (EAC, ESA). Santana do Cariri, Guritiba, 2.VI.1966, fl., *J.S. Sobrinho 340* (IPA). São Benedito, Buriti-Apuá, 11.X.1997, fl. and fr., *M. Aparecida* (EAC 25796). Sobral, estrada dos remédios, Fazenda Pedra branca, 03°36'57"S, 40°19'17"W, 3.IV.2017, fl. and fr., *E.B. Souza et al. 4528* (EAC, HUVA). Tauá, Tacelão, bacia do riacho Carrapateira, 05°24'19"S, 40°03'52"W, 20.IV.2014, fl., *A.C. Gomes* (EAC 57395). Tianguá, Chapada da Ibiapaba, 21.VIII.1987, fl., *A. Fernandes & Matos* (EAC 15090). Tururu, comunidade quilombola de Água Preta, 21.III.2015, fl., *J.C.M.S.M. Sobczak 21* (EAC). Ubajara, Jaburuna Norte, Planalto do Ibiapaba, 9.VII.1993, fl., *F.S. Araújo* (UEC, EAC). Viçosa do Ceará, Chapada da Ibiapaba, 3.I.1984, fl., *A. Fernandes* (EAC 12275).

Passiflora cincinnata is easily recognized by having simple leaves (3–5 lobes) or compounds (3–5 leaflets), petals lilac with filaments of the corona mixture of the colors purple, lilac and white.

Species recorded in the Paraguay, Argentina, Bolivia, Venezuela and Colombia (Killip 1938a). *Passiflora cincinnata* occurs in the all Brazilian territory (BFG 2018; Flora do Brasil 2020 under construction). In Ceará it has broad distribution and occurs in 44 municipalities. It was recorded in the Vegetation Complex of the Coastal Zone (Lowland Semideciduous Forest - Mata de Tabuleiro), Semideciduous Seasonal Forest (Mata Seca), Dense Ombrophilous Forest (Mata Úmida), Savana (Cerrado), Stepic Savanna (Caatinga/Carrasco), Arboreous Stepic Savanna (Caatinga Arbórea) and Vegetation under Fluvial and/or Lacustrine Influence (Mata Ciliar) (Fig. 1), at altitudes between

73–950 m. It was registered in three Conservation Units in Ceará territory: Floresta Nacional do Araripe, Private Natural Heritage Reserve Serra das Almas and Aiuaba Ecological Station. It was collected in cultivated land, residential areas, woods and roadside.

Passiflora cincinnata is frequently cultivated near the houses with food purposes (juice and dessert), ornamental and medicinal, being its leaves and fruits used to prepare soothing teas and for treatment of insomnia and depression.

The species is collected with flowers and fruits practically all year.

Popular names: maracujá de mato, maracujá de estalo, maracujá de vaqueiro, maracujá de boi, maracujá brabo, maracujá bravo, maracujá capoeira, maracujá preto.

5. *Passiflora edulis* Sims, Bot. Mag. 45: t. 1989. 1818. Figs. 2l-n; 3

Vine woody. Stem cylindrical, striate, pubescent. Stipules 0.2–0.5 cm long, persistent, linear, glabrous, apex acute, margin entire to slightly serrate, non-glandular. Petioles 1–6.5 cm long,

glabrous to pubescent, with a pair of glands sessile near the apex, green. Leaf blade 5.7–11.5 × 3.7–10.6 cm, simple, entire, elliptical or 5.7–14.5 × 12–23.5 cm, simple, 2–3 lobed, lobes elliptical, central lobe 3.7–10.2 × 3.5–7.1 cm, lateral lobes 3.7–13.2 × 3–6.9 cm, sometimes presents polymorphism in the same individual, membranaceous, glabrous, apex acuminate, base cordate, margin serrate, penninerved or 2–3 nerved, glands absent, ocelli absent. Pedicel 3.7–6.4 cm long, glabrous to pubescent; bracts 2–3.4 × 1.6–2.2 cm, ovate, apex acute, base obtuse, sessile, margin dentate, persistent, glabrous, glands absent. Flowers 5.8–6.5 cm diam., solitary, calyx tube campanulate; sepals 2.2–4.4 × 0.8–1.5 cm, oblong, apex acute, with a horn, with a pair of glands sessile, membranaceous, glabrous, adaxial surface white, abaxial surface green; petals 2.9–3.3 × 0.5–1.2 cm, oblong, apex obtuse or rounded, membranaceous, adaxial and abaxial surface white; filaments of the corona arranged into 3–4 series, mixture of the colors purple and white, external serie 2.8–3.4 cm long, median serie 0.5–1.2 cm long, internal serie 0.1–0.2 cm long; nectariferous ring present; androgynophore

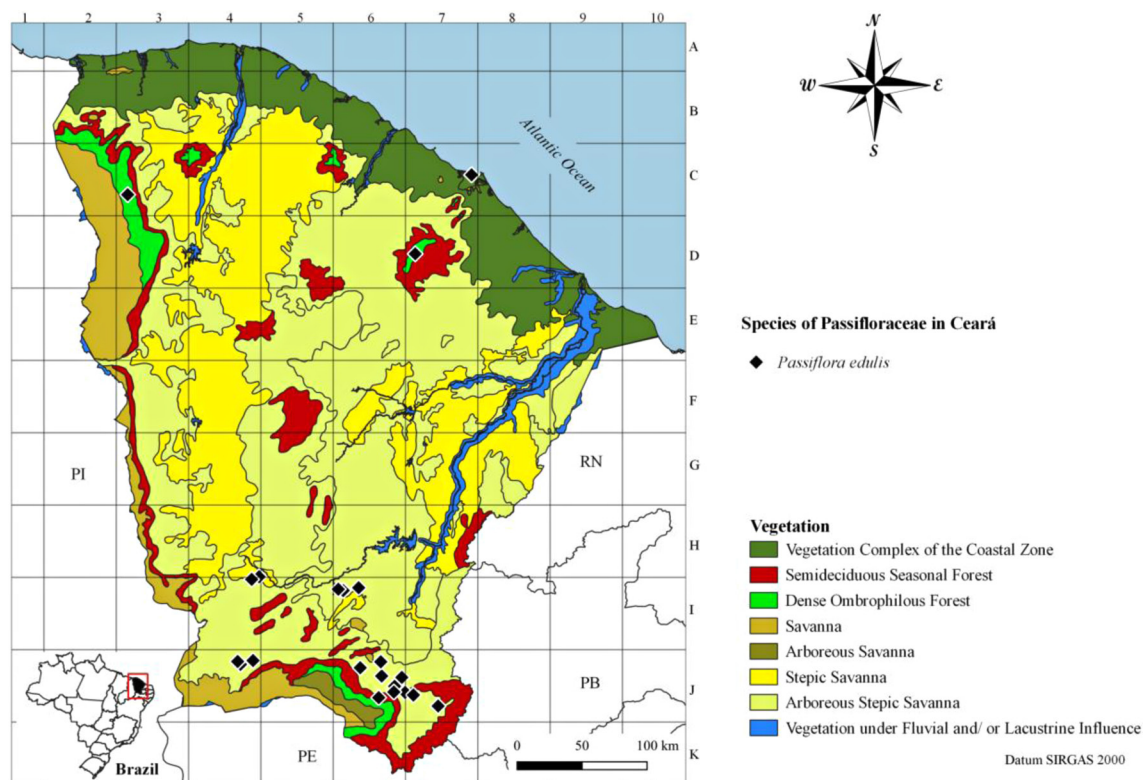


Figure 3 – Distribution of *Passiflora edulis* in Ceará state, Northeast Brazil. Source: Rebouças *et al.* (2020).

0.9–1.1 cm long; filaments 0.1–0.2 cm long, with purple spots, anthers 1.2–1.5 cm long, styles 1–1.3 cm long, green, stigma 0.5–0.7 cm long; ovary 0.4–0.6 × 0.3–0.4 cm, elliptical-ovoid, velutine. Berry 6.4–7.2 cm diam., globose, pericarp smooth, glabrous, yellow or purple when mature, ocelli white; seeds 0.4–0.7 × 0.2–0.3 cm, ovate, foveolate.

Examined material: Abaiara, Sítio Livramento, 07°19'15"S, 39°02'55"W, 7.VII.2019, fl., *F.G.L.S. Souza & V.S. Januário 33* (HCDAL). Altaneira, Sítio Serra do Valério, 06°59'10"S, 39°43'11"W, 15.VI.2019, fl., *F.G.L.S. Souza & M.G.L. Sampaio 15* (HCDAL). Antonina do Norte, Sítio Serra dos Almeidas, 06°49'57"S, 40°01'28"W, 16.VI.2019, fl., *F.G.L.S. Souza & M.G.L. Sampaio 19* (HCDAL). Araripe, Sítio Tanquinho, 07°10'16"S, 40°14'14"W, 16.VI.2019, fl., *F.G.L.S. Souza & M.G.L. Sampaio 27* (HCDAL). Assaré, Sítio São José, 06°58'21"S, 39°46'47"W, 15.VI.2019, fr., *F.G.L.S. Souza & M.G.L. Sampaio 17* (HCDAL). Barbalha, Malvinas, 07°18'20"S, 39°16'49"W, 18.IV.2019, fl., *F.G.L.S. Souza 07* (HCDAL). Brejo Santo, bairro Ladeira Vermelha, 07°29'56"S, 39°00'28"W, 25.X.2019, fl., *F.G.L.S. Souza & M.G.L. Sampaio 40* (HCDAL). Campos Sales, Sítio Lagoa Coberta, 06°51'38"S, 40°06'39"W, 16.VI.2019, fl., *F.G.L.S. Souza & M.G.L. Sampaio 22* (HCDAL). Crato, Sítio Baixa do Maracujá, 07°12'48"S, 39°31'32"W, 13.II.2020, fl., *F.G.L.S. Souza & A.B. Tavares 48* (HCDAL). Farias Brito, Sítio Lambedouro, 06°57'17"S, 39°32'40"W, 15.VI.2019, fl., *F.G.L.S. Souza & M.G.L. Sampaio 13* (HCDAL). Fortaleza, bairro Joaquim Távora, urbano, 11.IV.2008, fl., *J.F.N. Gomes Neto* (EAC 42059). Guarimiranga, terreno cultivado, 18.X.1984, fl., *F. Cavalcante* (EAC 12811). Jardim, Sítio Gravata, 07°33'13"S, 39°18'54"W, 12.III.2019, fl., *F.G.L.S. Souza & J.W.A. Bezerra 01* (HCDAL). Juazeiro do Norte, Sítio Taquari, 07°08'35"S, 39°17'11"W, 18.IV.2019, fl., *F.G.L.S. Souza & K.S. Januário 10* (HCDAL). Mauriti, Sítio Queimadas, 07°77'44"S, 38°77'44"W, 7.VII.2019, fl., *F.G.L.S. Souza & V.S. Januário 37* (HCDAL). Milagres, Sítio Nazaré, 07°31'33"S, 38°94'56"W, 7.VII.2019, fl., *F.G.L.S. Souza & V.S. Januário 35* (HCDAL). Missão Velha, Sítio Pinheira, 07°25'30"S, 39°07'56"W, 13.III.2019, fl. and fr., *F.G.L.S. Souza & M.G.L. Sampaio 03* (HCDAL). Potengi, Sítio Barreiro da Ema, 07°07'50"S, 40°05'43"W, 16.VI.2019, fl., *F.G.L.S. Souza & M.G.L. Sampaio 30* (HCDAL). Porteiras, Porteiras, Sítio Mingu, 07°29'26"S, 39°08'08"W, 8.III.2020, fl., *F.G.L.S. Souza & I.C.S. Neves 63* (HCDAL). Salitre, Sítio Jacarandá, 07°08'15"S, 40°16'08"W, 16.VI.2019, fl., *F.G.L.S. Souza & M.G.L. Sampaio 26* (HCDAL). Ubajara, 25.V.2001, fl., *J.P. Cornélio & A.C.G. Ascui* (HUVA 2389).

Passiflora edulis is easily recognized by having simple leaves, entire or 2–3 lobed, white petals, filaments of the corona mixture of the colors de purple and white, yellow or purple berry when mature, with white ocelli.

It is cultivated in all tropical countries of the world (Machado *et al.* 2008). The species has distribution practically in all Brazilian territory (BFG 2018; Flora do Brasil 2020 under construction). In Ceará it has broad distribution and occurs in 21 municipalities. It is recorded in the Vegetation Complex of the Coastal Zone (Lowland Semideciduous Forest - Mata de Tabuleiro), Semideciduous Seasonal Forest (Mata Seca), Dense Ombrophilous Forest (Mata Úmida), Stepic Savanna (Caatinga/Carrasco) and Arboreous Stepic Savanna (Caatinga Arbórea) (Fig. 3), at altitudes between 357–969 m. Collected in cultivated areas and residential.

It has economic value and it is the species most cultivated in the Brazil (Junqueira *et al.* 2005) with food purposes (juice and dessert). Several producers commercialize the fruits that also are used in popular medicine, being its leaves and fruits indicated for treatment of insomnia, anxiety and nervousness.

The species is collected with flowers and fruits all year.

Popular names: maracujá, maracujá de ponche.

6. *Passiflora foetida* L. var. *foetida*, Sp. Pl. 2: 959. 1753.

Figs. 4; 5a-b

Vine herbaceous. Stem cylindrical, striate, hirsute. Stipules 0.1–1.1 × 0.7–1.1 cm, persistent, pinnatisect, tomentose, apex acute, margin laciniate, glandular. Petioles 0.3–8.6 cm long, hirsute, glandular along the petioles, green. Leaf blade 1–2 × 0.9–2.5 cm, simple, entire, ovate or 1.4–9.5 × 1.2–5.7 cm, simple, 3-lobed, lobes ovate, central lobe 0.6–4.5 × 0.6–9 cm, lateral lobes 0.5–5.8 × 0.5–5.6 cm, sometimes presents polymorphism in the same individual, lobes ovate, membranaceous, hirsute, apex acuminate, base cordate, margin serrate, penninerved or 3-nerved, glandular along the leaf, ocelli absent. Pedicel 1.5–9.8 cm long, hirsute; bracts 1.8–4.6 × 0.6–4 cm, pinnatisect, sessile, persistent, hirsute, glandular. Flowers 1.8–4 cm diam., solitary, calyx tube campanulate; sepals 1.1–2.2 × 0.3–1 cm, oblong, apex acute or rounded, with a horn, membranaceous, tomentose, adaxial surface white or blue, abaxial surface green; petals 1.1–2.2 × 0.3–1 cm, oblong, apex rounded, membranaceous, adaxial and abaxial surface white or blue; filaments of the corona arranged into five series, three external serie 1–4 cm long, two internal serie 0.1–0.2 cm long, white or mixture of the colors white and blue; nectariferous ring present;

androgynophore 0.3–0.7 cm. long; filaments 0.2–0.3 cm long, with purple spots, anthers 0.3–0.4 cm long, styles 0.3–0.4 cm long, green, stigma ca. 0.1 cm long; ovary 0.2–0.3 × 0.1–0.2 cm, elliptical, villous. Berry 1.5–3.1 cm diam., globose, pericarp smooth, glabrous, green, ocelli absent; seeds 0.4–0.5 × 0.2–0.3 cm, oblong, alveolate.

Examined material: Acaraú, próxima ao açude de Piranhas, 8.VII.2015, fl., *A.R. Silva 17* (HUVA). Aiuaba, Lagoa do Rosilho, 06°37'00"S, 40°08'00"W, 10.XII.1997, fl., *I.M. Andrade, L.W. Lima-Verde 219* (EAC). Amontada, distrito de Icarai de Amontada, praia de Icaraizinho, 03°49'44"S, 39°57'86"W, 5.IX.2015, fl. and fr., *E.B. Souza et al. 3715* (EAC, HUVA). Antonina do Norte, Sítio Macambira, 06°49'52"S, 40°04'19"W, 16.VI.2019, fl. and fr., *F.G.L.S. Souza & M..G.L. Sampaio 20* (HCDAL). Aracati, Aroeiras, 04°57'30"S, 37°98'69"W, 1.V.2015, fl. and fr., *M.I.B. Loiola et al. 2595* (EAC). Araripe, Sítio Tanquinho, às margens da estrada CE-292, 07°10'17"S, 40°14'11"W, 16.VI.2019, fr., *F.G.L.S. Souza & M..G.L. Sampaio 29* (HCDAL). Assaré, Chapada do Araripe, 26.VII.2014, fl. and fr., *B.V. Almeida* (HCDAL 10900). Aurora, Comunidade Angico de Cima, 21.III.2014, fl. and fr., *M.O. Santos* (HCDAL 10717). Barroquinha, distrito de Bitupitá,

02°92'30"S, 41°20'38"W, 10.VI.2016, fl. and fr., *E.B. Souza et al. 4241* (HUVA). Campos Sales, Sítio Lagoa Coberta, 06°51'37"S, 40°06'43"W, 16.VI.2019, fl. and fr., *F.G.L.S. Souza & M..G.L. Sampaio 24* (HCDAL). Canindé, entre Madalena e Canindé (BR-020), 11.IV.1998, fl., *E.B. Souza* (EAC 26396). Capistrano, Fazenda Araçanga, Serra de Baturité, 14.VII.1994, fl., *J.B.L.P. Medeiros & L.W. Lima-Verde* (EAC 21604). Caridade, Papagaio, Olho d'água, 11.II.1989, fl., *Angélica et al.* (EAC 17175). Caucaia, Parque Botânico de Caucaia, 17.IV.1998, fl., *L.Q. Matias* (EAC 26981). Coreaú, entrada da cidade, 03°32'29"S, 40°39'49"W, 19.VII.2014, fr., *M.I.B. Loiola et al. 2436* (EAC). Crateús, Lagoa das Pedras, Sítio Gameleira, 9.II.2008, fl. and fr., *C. Rocha* (EAC 41824). Crato, Sítio Almêcegas, 07°12'30"S, 39°26'35"W, 27.II.2020, fr., *F.G.L.S. Souza & M.G.L. Sampaio 54* (HCDAL). Forquilha, BR-222, 17.V.2015, fl., *F.A.A. Nepomuceno & J.A. Nepomuceno 90* (HUVA). Fortaleza, Cidade dos Funcionários, 26.VII.1993, fl., *I.M.B. Sá 109* (EAC). General Sampaio, Reserva Particular do Patrimônio Natural Fancy Nunes, Fazenda Natália, 27.V.2007, fl. and fr., *M.F. Moro et al. 206* (EAC). Graça, Sítio Santa Clara, 03°57'43"S, 40°49'04"W, 5.III.2017, fl. and fr., *F.F. Araújo 128* (HUVA). Granja, localidade de Papagaios, 03°11'11"S, 40°44'35"W, 22.II.2018,

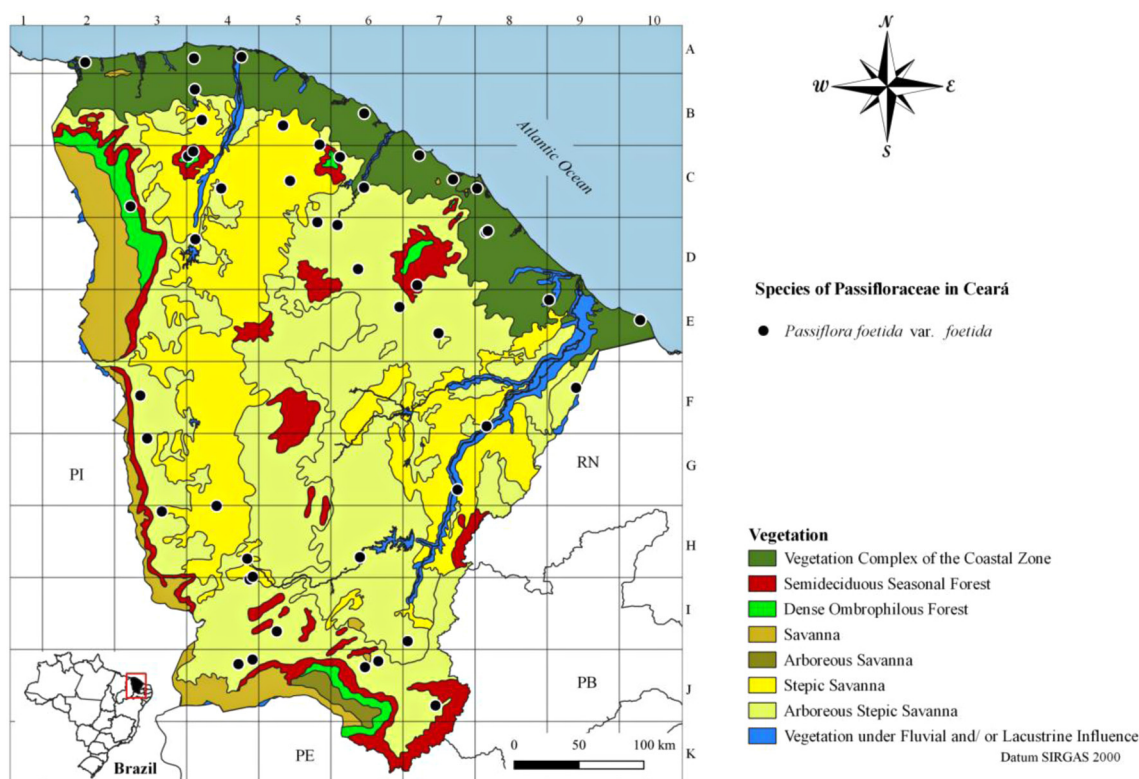


Figure 4 – Distribution of *Passiflora foetida* var. *foetida* in Ceará state, Northeast Brazil. Source: Rebouças *et al.* (2020).

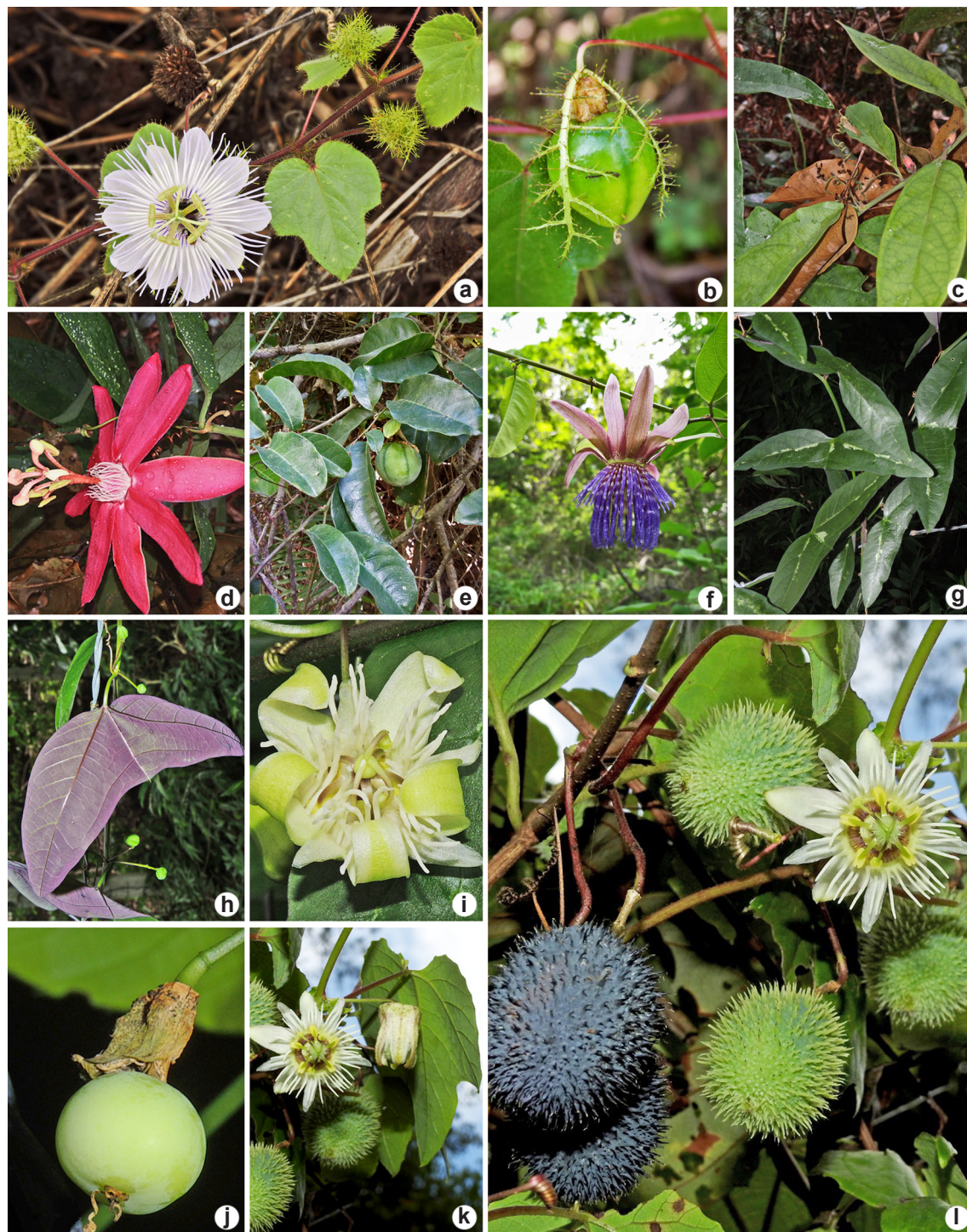


Figure 5 – a-l. *Passiflora* in Ceará state, Northeast Brazil – a-b. *Passiflora foetida* var. *foetida* – a. branch with leaves, buds and flower; b. pinatissecta bract and fruit; c-d. *P. glandulosa* – c. leaves and buds; d. flower; e-f. *P. laurifolia* – e. branch with leaves and fruit; f. flower; g-j. *P. misera* – g. leaf (adaxial surface); h. leaf (abaxial surface) and buds; i. flower; j. fruit; k-l. *P. morifolia* – k. leaf, bud and flower; l. flower and fruits. (a, g-j. RT Queiroz; f. FWS Machi; k-l. André Neto).

fl., *E.B. Souza et al.* 4923 (HUVA). Groeiras, distrito de Itamaracá, 24.III.2017, fl., *C. Brasileiro* (HUVA 21885). Guaiúba, Água Verde, 04°09'35"S, 38°41'18"W, 17.V.2017, fl., *J.C.M.S.M. Sobczak* 622 (EAC). Ibaratema, Fazenda Triunfo, 2.VI.2016, fl., *L.B. Silva & M.P.M. Gonçalves* 2 (HST). Ibiapina, 4.V.1995, fl., *M.F. Mata & C.A.O. Alves* 326 (HUVA). Icapuí, Área de Proteção Ambiental de Redonda, 9.IX.2000, fl., *Lima et al.* 02 (EAC). Icó, 89 km ao N de Icó, BR-116, 05°45'S, 38°42'W, 14.II.1985, fl., *E. Zardini & A. Fernandes* 50095 (EAC, MO). Iguatu, Sítio Bravo, 25.II.2011, fl., (HCDAL 6194). Ipu, distrito Ingazeiras, Sítio Coqueiros, 04°15'18"S, 40°44'00"W, 25.II.2018, fl., *J.B.S. Nascimento & A.L.S. Sales* 210 (HUVA). Irauçuba, num pequeno Serrote, 25.XI.1978, fl., *A. Fernandes & P. Bezerra* (EAC 5203). Itapipoca, Maciço de Uruburetama, 12.III.2016, fl., *F.D.S.* 497 (HUVA). Jaguaribe, Fazenda Mulungu, 20.XII.1994, fl. and fr., *M.A. Figueiredo* (EAC 21782). Jijoca de Jericoacoara, Área de Proteção Ambiental de Jericoacoara, 9.III.1997, fl., *L.Q. Matias* (EAC 25003). Juazeiro do Norte, Sítio Taquari, 07°08'15"S, 39°17'13"W, 18.IV.2019, fl., *F.G.L.S. Souza & K.S. Januário* 09 (HCDAL). Mauriti, Sítio Queimadas, encontrada às margens da estrada CE-192, 07°38'92"S, 38°77'44"W, 7.VII.2019, fr., *F.G.L.S. Souza & V.S. Januário* 38 (HCDAL). Meruoca, Sítio Santo Antônio, Serra da Meruoca, 9.III.1981, fl. and fr., *A. Fernandes & E. Nunes* (EAC 9920). Missão Velha, Sítio Pinheira, 07°12'30"S, 39°26'35"W, 8.III.2020, fl., *F.G.L.S. Souza & M.G.L. Sampaio* 56 (HCDAL). Novo Oriente, 21.VII.1989, fl. and fr., *M.A. Figueiredo et al.* (EAC 15978). Parambu, Fazenda Pau Preto, 22.V.1982, fl. and fr., *E. Nunes* (EAC 11471). Pentecoste, Serrote de Tamanduá, 31.III.2001, fl., *A. Andrade* (EAC 30579). Potengi, Sítio Barreiro da Ema, 07°07'01"S, 40°04'34"W, 16.VI.2019, fr., *F.G.L.S. Souza & M.G.L. Sampaio* 32 (HCDAL). Quixadá, Fazenda Não Me Deixes, 4.IX.2000, fl. and fr., *R.C. Costa* (EAC 32002). Quixerê, Fazenda Mato Alto, 05°18'33"S, 37°80'00"W, 13.VI.1996, fl., *L.W. Lima-Verde & M.A. Figueiredo* 260 (EAC). Redenção, Manoel Dias, Sítio Furna da Onça, 04°10'29"S, 38°42'56"W, 29.III.2015, fr., *M.I.B. Loiola et al.* 2572 (EAC). São Gonçalo do Amarante, Dunas do Pecém, 13.I.2004, fl., *A.V. Vieira & M.F. Lima* (EAC 33535). Sobral, distrito de Taperauba, 04°03'32"S, 39°59'35"W, 1.III.2018, fl. and fr., *E.B. Souza et al.* 4968 (HUVA). Tauá, 31.X.1985, fl. and fr., *A. Fernandes & Matos* (EAC 13865). Trairi, Flexeiras, terreno baldio próximo à igreja (pracinha), 19.IV.1999, fl., *R. Amado* 121 (EAC). Tururu, comunidade quilombola de Água Preta, 21.III.2015, fl., *J.C.M.S.M. Sobczak* 26 (EAC).

Passiflora foetida var. *foetida* is easily recognized by having glandular trichomes in the vegetative and reproductive parts, pinnatisect bracts and stipules, petals white or blue with filaments of the corona white or mixture of the colors white and blue.

It is recorded in Dominica, Martinique, Curacao, Venezuela, Surinam Guiana, French Guiana, in Caribbean islands, Mexico and Colombia (Vanderplank 2013). It occurs in all Brazilian territory (BFG 2018; Flora do Brasil 2020 under construction). In Brazil, there are records of two others variations: *Passiflora foetida* var. *baraquiniana* (Lem.) Vanderplank with occurrence in the state of Amazon and *Passiflora foetida* var. *nigelliflora* (Hook.) Mast. with occurrence for South region of the country. In Ceará it has broad distribution and occurs in 50 municipalities. It was found in the Vegetation Complex of the Coastal Zone (Pioneer Psamophilous Vegetation/Forest behind the Dunes/Lowland Semideciduous Forest-Mata de Tabuleiro), Semideciduous Seasonal Forest (Mata Seca), Dense Ombrophilous Forest (Mata Úmida), Stepic Savanna (Caatinga/Carrasco), Arboreous Stepic Savanna Caatinga Arbórea) and Vegetation under Fluvial and/or Lacustrine Influence (Mata Ciliar) (Fig. 4), from sea level to 804 m. It occurs in five Conservation Units of Ceará state: Private Natural Heritage Reserve Serra das Almas, Aiuaba Ecological Station, Jericoacoara Environmental Protection Area, Private Natural Heritage Reserve Fancy Nunes and Redonda Environmental Protection Area. It was collected agricultural areas and roadside.

Its leaves and fruits has antimicrobial activity (Mohanasundari *et al.* 2007).

The species is collected with flowers and fruits practically all year.

Popular names: maracujá do mato, maracujá silvestre, maracujá de estalo, maracujá de estralo, campú-de-rato, maracujá bravo, maracujá brabo, maracujá de estrada, maracujá raposa.

7. *Passiflora glandulosa* Cav., Diss. 10: 453. t. 281. 1790. Figs. 5c-d; 6

Vine woody. Stem cylindrical, striate, glabrous. Stipules 0.2–0.4 cm long, caducous, linear, glabrous, apex acute, margin entire, non-glandular. Petioles, 0.5–0.8 cm long, glabrous, with a pair of glands sessile between median to basal regions of petioles, green. Leaf blade 4.3–11.5 × 1.1–4.3 cm, simple, entire, oblong-lanceolate, chartaceous, glabrous, apex acuminate, base obtuse or rounded, margin entire to undulate, penninerved, glands absent, ocelli absent. Pedicel 4–6.5 cm long, glabrous; bracts 0.2–0.4 × 0.1–0.2 cm, linear, apex acute, sessile, margin entire, glandular, persistent, glabrous. Flowers 7.6–9 cm diam., solitary, calyx tube cylindrical; sepals 3.3–4 × 0.6–0.8 cm, oblong-

lanceolate, apex acute or obtuse, with a horn, thick, glabrous, adaxial and abaxial surface pink; petals 2.5–4 × 0.6–0.9 cm, oblong-lanceolate, apex acute or obtuse, membranaceous, pink; filaments of the corona arranged into two series, external serie 1–1.2 cm long, internal serie 0.6–0.8 cm long, white; nectariferous ring absent; androgynophore 1.5–2.4 cm long; filaments 0.5–0.7 cm long, pink, anthers ca. 0.6 cm long, styles 0.6–0.8, pink, stigma ca. 0.3 cm long; ovary 1–1.3 × 0.2–0.3 cm, elliptical-ovoid, glabrous. Berry ca. 6–7.4 × 4.4–6.7 cm, ovoid, pericarp smooth, glabrous, yellow when mature, ocelli white; seeds 0.7–0.8 × ca. 0.3 cm, oblong-cordate, foveolate.

Examined material: Guaraciaba do Norte, rodovia para Ipu, 3.I.1998, fl., *A.S.F. Castro* (EAC 26033). Ibiapina, 18.VII.2007, fl. and fr., *A.A. Leopoldino 4* (HUVA). São Benedito, Serra da Ibiapaba, numa capoeira, 7.I.1942, fr., *P. Bezerra* (EAC 489). Tianguá, entre Tianguá e Viçosa do Ceará, 13.I.1985, fl., *A. Fernandes & J. Georgen* (EAC 12969). Ubajara, Parque Nacional de Ubajara, 26.XII.2005, fl., *A.S.F. Castro 39026* (EAC). Viçosa do Ceará, Chapada do Ibiapaba, 3.I.1984, fl. and fr., *A. Fernandes* (EAC 12276).

Passiflora glandulosa distinguished from the others species by having oblong-lanceolate leaves, pink flowers, filaments of the corona white, yellow berry when mature, white ocelli.

It occurs from Guyanas to Brazil (Killip 1938b). In Brazil it was citad for the Northeast, North and Center-West regions (BFG 2018; Flora do Brasil 2020 under construction). In Ceará territory it has distribution moderate and it was collected in six municipalities. It was found in the Dense Ombrophilous Forest (Mata Úmida) and Savana (Cerrado) (Fig. 6), at altitudes between 870–940 m. It occurs in one Conservation Unit of Ceará territory: Ubajara National Park.

The species flowers in January, September, October and December, fruits in January, October and December.

Popular name: maracujá.

8. *Passiflora kermesina* Link & Otto, Verh. Vereins Beford. Gartenbaues Konigl. Preuss. Staaten. 2: 403. t. 15. 1826. Fig. 6

Vine herbaceous. Stem cylindrical, striate, glabrous. Stipules 1.4–2 × 0.7–0.9 cm, persistent, lanceolate, glabrous, entire, apex rounded, margin entire, non-glandular. Petioles 1.3–2.4 cm long, glabrous with two to five glands stipitate at the median region of petiole, green. Leaf blade 3.2–5.2 × 4.2–7.2 cm, simple, 3-lobed, central lobe 1.7–3.1 × 2–3 cm, lateral lobes 2.2–3.9 × 1.5–2.4 cm,

lobes oblong, membranaceous, glabrous, apex rounded, mucronate, base truncate, glandular, margin denticulate, 3-nerved, ocelli absent. Pedicel 6.7–12 cm long, glabrous; bracts 1–3.3 × 1.1–2.2 cm, linear, apex acute, base obtuse, sessile, margin entire, caducous, glabrous, glands absent. Flowers 7.8–8.1 cm diam., solitary, calyx tube cylindrical-campanulate; sepals 2.4–3.6 × 0.5–0.6 cm, linear, apex obtuse, without horn, membranaceous, glabrous, adaxial and abaxial surface pink; petals 2.1–3.5 × 0.5–0.6 cm, linear, apex obtuse, membranaceous, adaxial and abaxial surface pink; filaments of the corona arranged into three series, external series 0.8–1 cm long, internal serie 0.3–0.5 cm long, purple; nectariferous ring present; androgynophore 4–5.1 cm long.; filaments 0.8–0.9 cm long, with purple spots, anthers 0.7–0.9 cm long, styles ca. 0.5 cm long, with purple spots, stigma ca. 0.2 cm long; ovary 0.6–0.9 cm long, elliptical, glabrous, glaucous. Berry 6.3–7.3 × 2.3–3.1 cm long, ellipsoid, pericarp smooth, glabrous, green, ocelli absent, seeds ca. 0.3 × 0.2 cm, ovate, alveolate.

Examined material: Guaramiranga, estrada para o Pico Alto, 04°21'56"S, 38°95'40"W, 24.IV.2010, fl., *M. Milward-de-Azevedo & D.J.L. Souza 205* (UEC). Ubajara, Sítio Buriti, 03°82'61"S, 40°93'05"W, 19.IV.2010, fl., *M. Milward-de-Azevedo & D.J.L. Souza 192* (UEC).

Additional material examined: BRAZIL. ESPÍRITO SANTO: Linhares, Reserva Florestal da Cia. Vale do Rio Doce, 10.V.1977, fl., *G. Martinelli et al. 1875* (RB). MINAS GERAIS: Carangola, Fazenda São Martinho, 20°43'S, 42°01'W, 21.XI.1991, fl., *L.S. Leoni* (RB 735266, GFJP 1711). Francisco de Sá, 10 km nordeste de Francisco de Sá, Serra do Espinhaço, 12.II.1969, fr., *H.S. Irwin et al.* (HUEFS 191671, NY 23137).

Passiflora kermesina has diagnostic characters of denticulate margin, cylindrical-campanulate calyx tube, pink flowers, filaments of the corona purple and ellipsoid berry. It is frequently confused with *P. castellanosii* and *P. picturata* (view comments).

Species endemic to Brazil (BFG 2018; Flora do Brasil 2020 under construction). It was recorded only in the Southeast region in the states of Espírito Santo, Minas Gerais and Rio de Janeiro, in the Caatinga, Cerrado, Atlantic Forest phytogeographic domains (BFG 2018; Flora do Brasil 2020 under construction). Therefore, *P. kermesina* is new occurrence for the Ceará, with restricted distribution to two municipalities. It occurs in the Dense Ombrophilous Forest (Mata Úmida) and Stepic Savanna (Caatinga/Carrasco) (Fig. 6), at altitudes between 829–885 m.

The species flowers and fruits in April.

9. *Passiflora laurifolia* L., Sp. Pl. 2: 956. 1753.

Figs. 5e-f; 6

Vine woody. Stem cylindrical, striate, glabrous. Stipules 0.2–0.7 cm long, persistent linear, glabrous, apex acute, margin entire, non-glandular. Petioles 0.4–1.8 cm long, glabrous, with a pair of glands sessile at the apex of petioles, green. Leaf blade 4.4–14.3 × 1.8–6.9 cm, simple, entire, oblong, coriaceous, glabrous, apex rounded, acute or obtuse, mucronate, base acute or rounded, margin entire to undulate, penninerved with central vein excentric, glands absent, ocelli absent. Pedicel 1.3–2.4 cm long, glabrous to pubescent; bracts 2–3.4 × 1–1.8 cm, oblong, apex obtuse, base obtuse, sessile, margin entire to slightly serrate, glandular, persistent, pubescent. Flowers 7.3–10.6 cm diam., solitary, calyx tube cylindrical-campanulate; sepals 3.4–4 × 1.1–5.1 cm, oblong, apex obtuse, with a horn, membranaceous, tomentose, adaxial and abaxial surface red; petals 2.4–4.5 × 1–1.1 cm, oblong, apex obtuse, membranaceous, adaxial and abaxial

surface red; filaments of the corona arranged into six series, external serie 1.4–2 cm long, two median series 2.6–4 cm long, three internal series 0.1–2.8 cm long, mixture of the colors red, white, lilac, blue and purple; nectariferous ring present; androgynophore 1–1.5 cm long; filaments 0.6–0.8 cm long, green, anthers 0.6–0.8 cm long, styles 0.3–0.5 cm long, green, stigma 0.2–0.3 cm long; ovary 0.7–0.9 × 0.3–0.4 cm, ovoid, pubescent. Berry 3.9–5.3 cm diam., globose, pericarp smooth, glabrous, yellow or orange when mature, ocelli absent; seeds 0.5–0.6 × ca. 0.3 cm, ovate, foveolate.

Examined material: Barbalha, geossítio Riacho do Meio, 07°21'52"S, 39°19'48"W, 11.III.2020, fr., *F.G.L.S. & A.B. Tavares 68* (HCDAL). Caucaia, Sargento Mor, 9.XI.2008, fr., *A.S.F. Castro 2139* (EAC). Crato, antigo aeroporto, 07°15'01"S, 39°30'03"W, 10.II.2020, fr., *F.G.L.S. & A.B. Tavares 45* (HCDAL). Ibiapina, Sítio Boa Água, 03°53'05"S, 40°53'42"W, 27.XII.2013, fr., *E.B. Souza et al. 2956* (HUVA). Missão Velha, Sítio Pinheira, 07°25'19"S, 39°07'43"W, 27.VI.2019, fr., *F.G.L.S. Souza & M.G.L. Sampaio 12* (HCDAL).

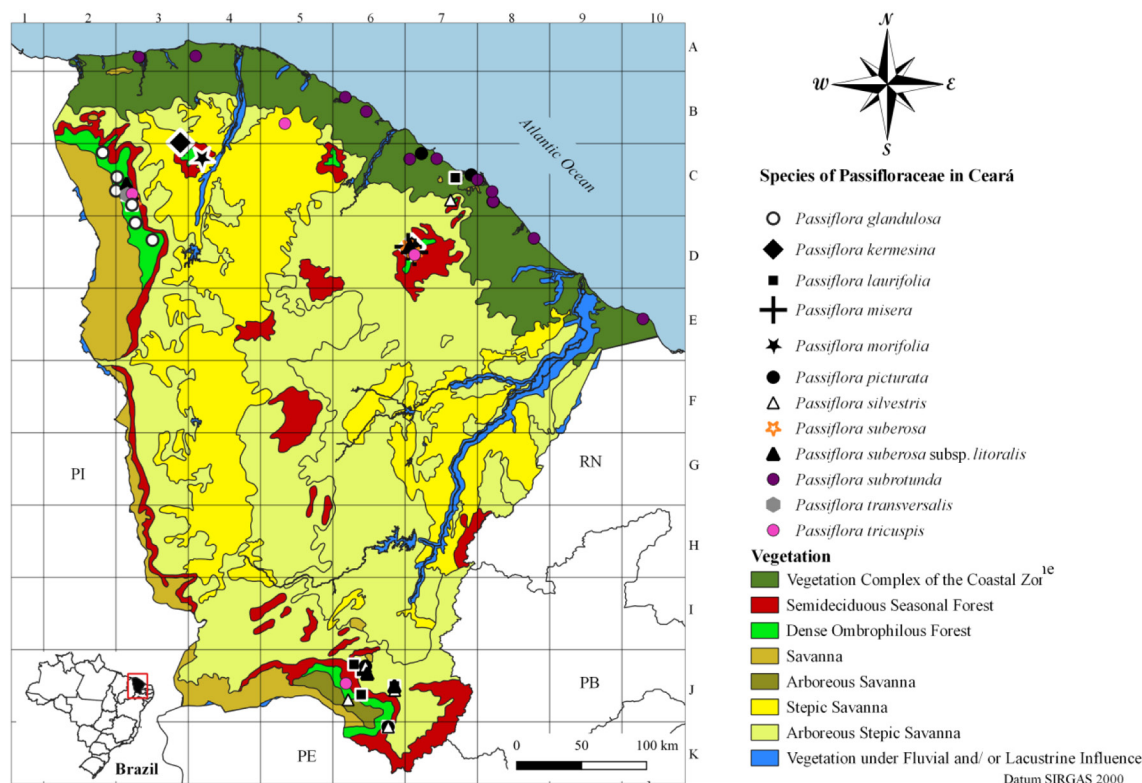


Figure 6 – Distribution of *Passiflora glandulosa*, *P. kermesina*, *P. laurifolia*, *P. misera*, *P. morifolia*, *P. picturata*, *P. silvestris*, *P. suberosa*, *P. suberosa* subsp. *litoralis*, *P. subrotunda*, *P. transversalis* and *P. tricuspis* in Ceará state, Northeast Brazil. Source: Rebouças *et al.* (2020).

Nova Olinda, Sítio Zabelê, 07°10'24"S, 39°35'37"W, 14.II.2013, fl. and fr., *A.B.M. Lima-Neto* (HCDAL 9983). Porteiras, estrada Jamacaru a Porteiras, 07°29'14"S, 39°08'42"W, 8.III.2020, fr., *F.G.L.S. Souza & I.C.S. Neves 57* (HCDAL). Ubajara, Planalto Cafundó, Planalto da Ibiapaba- Parque Nacional de Ubajara, 22.I.1999, fl., *A. Fernandes et al.* (EAC 27825).

Passiflora laurifolia is characterized by coriaceous leaf, red flowers, filaments of the corona arranged into six series mixture of the colors red, white, lilac, blue and purple.

Species cultivated in the Central America (Killip 1938a, 1941). In Brazil it was registered mainly in the North, Northeast and Center-West regions (BFG 2018; Flora do Brasil 2020 under construction). In Ceará it has moderate distribution and occurs in eight municipalities. It was found in the Vegetation Complex of the Coastal Zone (Lowland Semideciduous Forest - Mata de Tabuleiro), Semideciduous Seasonal Forest (Mata Seca), Dense Ombrophilous Forest (Mata Úmida) and Arboreous Stepic Savanna (Caatinga Arbórea) (Fig. 6), at altitudes between 126–972 m. It occurs in two Conservation Units in Ceará: Araripe-Apodi National Forest and Ubajara National Park. The species was collected near the residential areas, woods and wetlands.

It is used to prepare juice.

The species flowers in January, February, September, November and December, fruits in January, February, March, May, June, November and December.

Popular names: maracujá, maracujá brabo, maracujá bravo, maracujá peroba, maracujá de estralo, maracujá do mato, suspiro.

10. *Passiflora misera* Kunth, Gen. Sp. Nov. 2: 136. 1817. Figs. 5g-j; 6

Vine herbaceous. Stem flattened, striate, glabrous to pubescent. Stipules 0.2–0.4 cm long, caducous, linear, glabrous, apex acute, margin entire, non-glandular. Petioles 1.1–3.2 cm long, glabrous, non-glandular. Leaf blade 2.3–6 × 5.7–15.7 cm, simple, 2–3 lobed with central lobe atrophied, central lobe 0.1–0.2 × 1.2–1.7 cm, lateral lobes 5–7.3 × 2.3–3.1 cm, lobes oblong, membranaceous, pubescent, apex central lobe acute or obtuse, acuminate, apex lateral lobes acute, base truncate, margin undulate, 2–3 nerved, adaxial surface green, abaxial surface purple, glands absent, two ocelli at the base and four at the median region of leaf. Pedicel 3–4.7 cm long, pubescent; bracts 0.2–0.4 cm long, linear, apex

acute, sessile, margin entire, caducous, glabrous, glands absent. Flowers ca. 2.5 diam., solitary, calyx tube campanulate; sepals 0.9–1.2 × 0.5–0.6 cm, oblong-lanceolate, apex acute, with a horn, thick, glabrous, adaxial surface white, abaxial surface green; petals 0.9–1 × 0.3–0.4, oblong-lanceolate, apex acute, membranaceous, adaxial and abaxial surface white; filaments of the corona arranged into two series, external serie 0.8–1.1 cm long, internal serie 0.2–0.3 cm long, white; nectariferous ring present; androgynophore 0.5–0.8 cm long; filaments ca. 0.3 cm, green, anthers ca. 0.3 cm long, styles 0.3–0.4 cm long, green, stigma ca 0.1 cm long; ovary 0.2–0.3 × ca. 0.1 cm long, elliptical, glabrous. Berry 1–1.6 cm diam., globose, pericarp smooth, glabrous, black, ocelli absent; seeds ca. 0.2–0.3 × 0.1 cm, ovate, transversally sulcate.

Examined material: Guarimiranga, quase no topo do Pico Alto, na beira da estrada, 11.II.2009, fr., *M.F. Moro 710* (EAC). Pacoti, Pico Alto, 04°12'49"S, 38°58'45"W, 12.VIII.2012, fl., *M.L. Guedes 19273* (ALCB).

Additional material examined: BRAZIL. BAHIA: Prado, km 15-25 da rodovia para Itamaraju, 12.VIII.1995, fl. and fr., *G.M. Hatschbach & J.T. Motta 62999* (MBM).

Passiflora misera is distinguished by a flattened stem, leaf 2–3 lobed with central lobe atrophied, Petioles non-glandular, small diameter flowers (ca 2.5 diam.), filaments of the corona white, berry black when mature. *Passiflora misera* is confused with *P. transversalis*, but the first presents stipules, petioles and glabrous berry (vs. pubescent), elliptical ovary (vs. oblong).

Passiflora misera occurs in Nicaragua, Costa Rica, Panama, Guyana, Venezuela, Colombia, Bolivia, Brazil, Paraguay, and Argentina (Milward-de-Azevedo *et al.* 2012). It has broad distribution in the Brazilian territory (BFG 2018; Flora do Brasil 2020 under construction). In Ceará it has restricted distribution and occurs in two municipalities. It was found in the Dense Ombrophilous Forest (Mata úmida) and Semideciduous Seasonal Forest (Mata Seca) (Fig. 6), at altitudes between 876–970 m.

The species collected with fruit in February and with flower in August.

11. *Passiflora morifolia* Mast., *Fl. bras.* 13(1): 555. 1872. Figs. 5k-l; 6

Vine herbaceous. Stem angular, striate, pubescent. Stipules 0.2–0.3 × 0.5–0.7 cm, persistent, semi-ovate, pubescent, entire, apex acute, margin entire, non-glandular. Petioles 3.7–5.7 cm long, pubescent, with a pair of glands

sessile at the apex, green. Leaf blade 6.3–7 × 6.5–6.9 cm, simple, 3-lobed, central lobe 3–3.4 × 2.9–3.1 cm, lateral lobes 4.2–5 × 3.3–3.7 cm, lobes ovate, membranaceous, pubescent, apex acute, base cordate, margin dentate, 3-nerved, glands absent, ocelli absent. Pedicel 2.5–3 cm long, pubescent; bracts 0.2–0.5 × 0.2–0.3 cm, falciform, apex acute, base truncate, sessile, margin entire, persistent, pubescent. Flowers 2.6–3.7 cm diam., solitary, calyx tube campanulate; sepals 1.2–1.3 × 0.5–0.6 cm, oblong, apex obtuse, without horn, membranaceous, glabrous, adaxial and abaxial surface white; petals 0.7–0.9 × 0.4–0.5 cm, lanceolate, apex acute, membranaceous, adaxial and abaxial surface white; filaments of the corona arranged into one serie 0.6–0.9 cm long, white; nectariferous ring present; androgynophore 0.5–0.7 cm long; filaments 0.3–0.7 cm long, green, anthers 0.3–0.4 cm long, styles 0.3–0.5 cm long, green, stigma ca. 0.1 cm long; ovary 0.3–0.5 × 0.2–0.3 cm, oblong, hirsute. Berry 2.2–3.4 × 2.2–2.6 cm, ovoid, pericarp with hispid and thickened trichomes, glabrous, purple to black when mature, ocelli absent; seeds 0.3–0.5 × 0.2–0.3 cm, oblong, foveolate.

Examined material: Meruoca, Serra de Meruoca, 03°60'25"S, 40°40'38"W, 27.IV.2019, fr., *M.I.B. Loiola & A. Neto 2819* (EAC).

Additional material examined: BRAZIL. PARANÁ: Siqueira Campos, arredores, 29.III.1971, fl., *R. Kummrow 486* (MBM). RIO GRANDE DO SUL: Grúa, 15.III.1965, fl., *K. Hagelund 3443* (ICN).

Passiflora morifolia is distinguished by having angular stem, leaf blade 3-lobed with dentate margin, bracts falciform, white flowers and filaments of the corona into one serie, white, hirsute ovary and mainly by berry with hispid and thickened trichomes, black when mature. This type of berry is an exclusive characteristic this species among the others registered in Ceará.

It occurs in Guatemala, Venezuela, Colombia, Ecuador, Peru, Bolivia, Brazil, Paraguay and Argentina (Milward-de-Azevedo *et al.* 2012). In Brazil it was registered only in the Center-West, Southeast and South regions, in the Cerrado and Atlantic Forest phytogeographic domains (BFG 2018; Flora do Brasil 2020 under construction). Therefore, it is new occurrence in Ceará, with restricted distribution and it was considered rare by having confirmed occurrence only in the municipality of Meruoca, in the Semideciduous Seasonal Forest (Mata Seca) (Fig. 6), at altitude 796 m.

The species fruits in April.

12. *Passiflora picturata* Ker Gawl., Bot. Reg. 8: t. 673. 1822.

Figs. 6; 7a-d

Vine woody. Stem cylindrical, striate, glabrous. Stipules 1–2.1 × 0.7–2.8 cm, persistent, ovate, glabrous, entire, apex rounded, mucronate, margin entire to slightly serrate, non-glandular. Petioles 1.5–5.2 cm long, glabrous, with a pair of glands stipitate at the median region of petiole, green. Leaf blade 3.9–6.9 × 4.9–5.9 cm, simple, entire or 3.1–8 × 3.8–6.9 cm, simple, 3-lobed, central lobe 1.9–3.7 × 1.6–3.5 cm, lateral lobes 1.9–5.5 × 3.3–4 cm, sometimes presents polymorphism in the same individual, lobes ovate, membranaceous, glabrous, apex obtuse or rounded, mucronate, base subcordate, margin undulate, glandular, penninerved or 3-nerved, adaxial surface green, abaxial surface purple, ocelli absent. Pedicel 5.6–8.9 cm long, glabrous; bracts 2.6–3.3 × 1.6–1.8 cm, elliptical, apex rounded, base rounded, petiolates, margin entire, caducous, glabrous, glands absent. Flowers 4.2–7 cm diam., solitary, calyx tube campanulate; sepals 1.7–2.6 × 0.5–0.9 cm, oblong, apex obtuse, with a horn, thick, glabrous, adaxial surface pink, abaxial surface green; petals 1.5–1.8 × 0.5–1 cm, oblong, apex obtuse, membranaceous, adaxial and abaxial surface pink; filaments of the corona arranged into two series, external serie 0.7–0.9 cm long, internal serie 0.6–1.1 cm long, mixture of the colors purple and white; nectariferous ring present; filaments 0.4–0.7 cm long, anthers 0.6–0.8 cm long, styles ca. 0.7 cm long, with purple spots, stigma ca. 0.2 cm long; ovary 0.2–0.4 × 0.2–0.3 cm, ovoid, glabrous, glaucous. Berry 4–5.5 cm diam., globose, pericarp smooth, glabrous, green, ocelli absent; seeds ca. 0.5 × 0.2 cm, oblong, foveolate.

Examined material: Aquiraz, Berra Bode, 12.III.2005, fl., *A.S.F. Castro 1558* (EAC). Crato, Sítio Boa Vista, 07°11'46"S, 39°27'44"W, 27.II.2020, fr., *F.G.L.S. Souza & M.G.L. Sampaio 50* (HCDAL). Fortaleza, campus do Pici, 21.VIII.1985, *M.F. Mata* (EAC 13529). Porteiras, estrada Jamararu a Porteiras, 07°29'36"S, 39°07'57"W, 8.III.2020, fr., *F.G.L.S. Souza & I.C.S. Neves 61* (HCDAL). São Gonçalo do Amarante, Jardim Botânico de São Gonçalo do Amarante, 03°56'88"S, 38°88'73"W, 8.II.2018, fl., *V.S. Sampaio & L.F. Pinheiro 223* (EAC).

Passiflora picturata is identified by its petiolates bracts, restricted characteristic this species, among the others species registered in Ceará, simple leaf blade, 3-lobed with ovate lobes, adaxial surface of the sepals and pink petals, filaments of the corona arranged into two series mixture of the colors purple and white and glaucous ovary. It can be confused with *P. castellanosii* and *P. kermesina* (view comments).

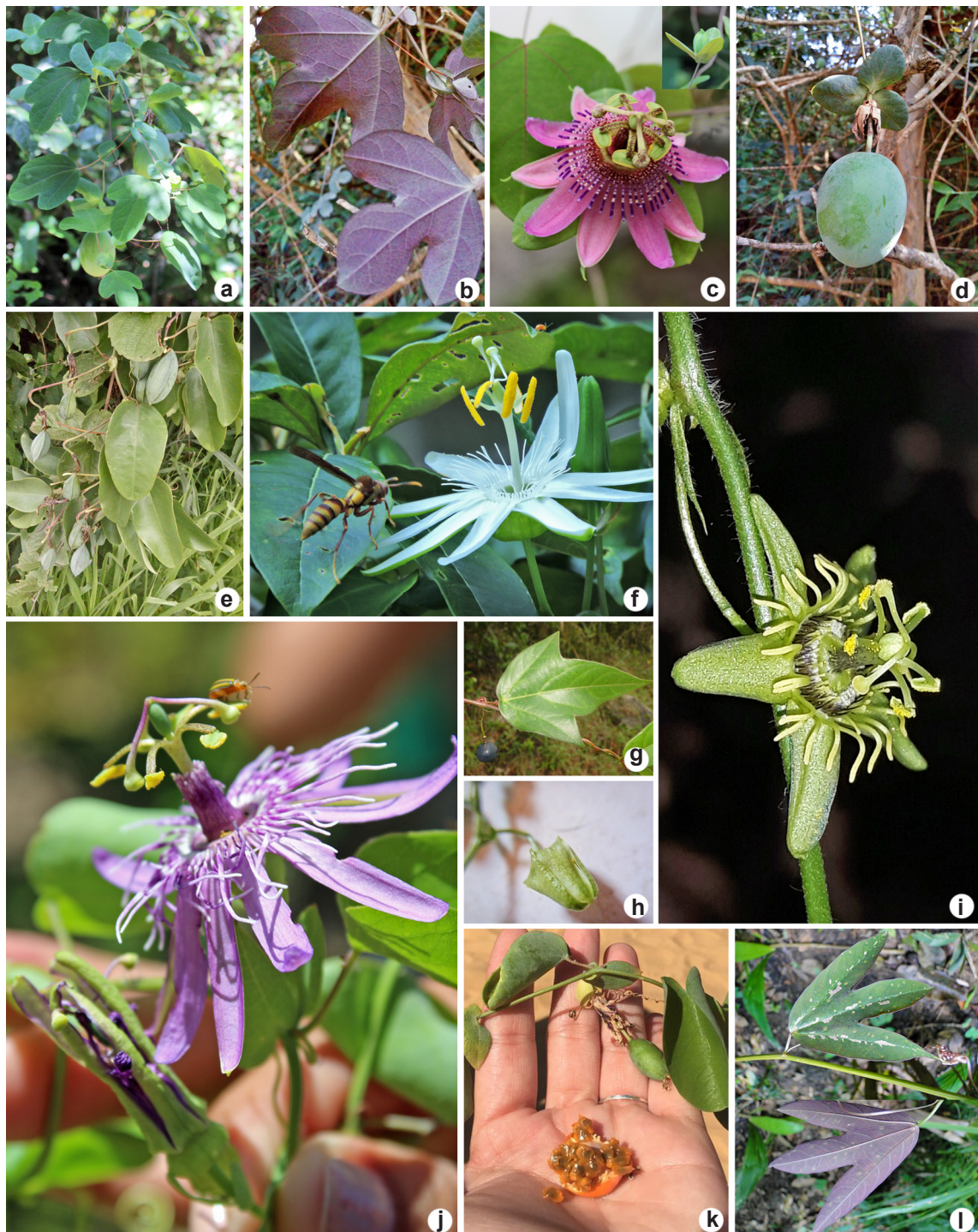


Figure 7 – a-l. *Passiflora* in Ceará state, Northeast Brazil – a-d. *Passiflora picturata* – a. leaf (adaxial surface); b. leaf (abaxial surface); c. bud and flower; d. fruit; e-f. *P. silvestris* – e. leaves and fruits; f. bud and flower; g-i. *P. suberosa* subsp. *litoralis* – g. leaf (adaxial surface) and fruit; h. bud; i. flower; j-k. *P. subrotunda* – j. branch with bud and flower; k. leaves, fruit and dehiscence of fruit; l. *P. tricuspis* – leaf (adaxial surface and abaxial surface). (f, i. RT Queiroz).

It was recorded in the Suriname and Brazil (Killip 1938a). In Brazil it has records in the North, Center-West and Northeast regions, in the states of Alagoas, Ceará, Maranhão and Piauí (BFG 2018; Flora do Brasil 2020 under construction). In Ceará, it has distribution restricted and occurs in five municipalities. It was found in the Vegetation Complex of the Coastal Zone (Lowland Semideciduous Forest - Mata de Tabuleiro), Semideciduous Seasonal Forest (Mata Seca) and Arboreous Stepic Savanna (Caatinga Arbórea) (Fig. 6), at altitudes between 28–966 m. It was recorded in one Conservation Unit of State: Floresta Nacional do Araripe.

The species flowers in January, February, March and August, fruits in February, March and April.

Popular names: maracujá, maracujá de estalo, maracujá de boi.

13. *Passiflora silvestris* Vell., Fl. Flumin. Icon. 9: t. 74. 1831. Figs. 6; 7e-f

Vine herbaceous. Stem cylindrical, striate, glabrous. Stipules 1–1.7 × 0.5–1.1 cm, persistent, ovate, entire, glabrous, apex acute, mucronate, margin entire, non-glandular. Petioles 0.7–2.2 cm long, glabrous, with a pair of glands stipitate at the median region of petiole, green. Leaf blade 5.1–11.2 × 2.4–6.9 cm, simple, entire, oblong, chartaceous, glabrous, apex obtuse, mucronate, base subcordate, margin entire, reticulate, glands absent, ocelli absent. Pedicel 1.9–3.5 cm long, glabrous; bracts 1.2–1.9 × 0.6–0.9 cm, oval-lanceolate, apex acute, acuminate, base truncate, sessile, margin entire, persistent, glabrous, glands absent. Flowers 6.3–7.2 cm diam., solitary, calyx tube cylindrical-campanulate; sepals 2.7–3.5 × 0.3–0.5 cm, lanceolate, apex acute or obtuse, with a horn, membranaceous, glabrous, adaxial surface white, abaxial surface green with central arista reddish; petals 1.8–2 × 0.2–0.4 cm, oblong, apex obtuse or rounded, membranaceous, white; filaments of the corona arranged into two series, external serie 1.3–1.5 cm long, internal serie 0.3–0.4 cm long, white; nectariferous ring present; androgynophore 1.5–2 cm long; filaments 0.5–0.6 cm long, white anthers ca. 0.3 cm long, styles 0.3–0.5 cm long, white, stigma ca. 0.1 cm long; ovary ca. 0.5 × 0.2 cm, ellipsoid, glabrous. Berry 3–4.9 × 1.7–2.9 cm, ovoid, 6-costate, glabrous, green, ocelli absent; seeds 0.3–0.4 cm, ovate, alveolate.

Passiflora silvestris is distinguished by ovate stipules, chartaceous leaf blade, sepals with abaxial

surface with central arista reddish, petals and filaments of the corona white and ellipsoid berry, 6-costate. *Passiflora silvestris* can be confused with *P. subrotunda*, but the first presents chartaceous leaves (vs. membranaceous), white petals (vs. purple); filaments of the corona white (vs. mixture of the colors purple, white and blue) and ellipsoid berry, 6-costate, green (vs. ovoid, pericarp smooth, orange).

Examined material: Barbalha, BR-CE, 07°34'74"S, 39°39'44"W, 31.II.2013, fl., L.Z.O. Campos 120 (EAC). Crato, Sítio Boa Vista, 07°11'46"S, 39°27'44"W, 27.II.2020, fr., F.G.L.S. Souza & M.G.L. Sampaio 52 (HCDAL). Maranguape, Serra da Aratanha, Espírito Santo, 2.XI.2015, fl., A.S.F. Castro 2898 (EAC). Missão Velha, estrada Porteiras a Jamacaru, 07°28'20"S, 39°07'24"W, 8.III.2020, fr., F.G.L.S. Souza & I.C.S. Neves 66 (HCDAL). Porteiras, estrada Jamacaru a Porteiras, às margens da estrada, 07°29'15"S, 39°07'59"W, 8.III.2020, fl. and fr., F.G.L.S. Souza & I.C.S. 59 (HCDAL).

Species endemic to Brazil with records in the Northeast and Southeast regions (BFG 2018; Flora do Brasil 2020 under construction). In Ceará it has restricted distribution and occurs in five municipalities. It was collected in the Vegetation Complex of the Coastal Zone (Lowland Semideciduous Forest - Mata de Tabuleiro), Semideciduous Seasonal Forest (Mata Seca), Florested Savanna (Cerradão) and Arboreous Stepic Savanna (Caatinga Arbórea) (Fig. 6), at altitudes between 740–920 m. It was recorded in one Conservation Unit of State: Araripe-Apodi National Forest.

The species is collected with flowers in January, February, March, October and November and with fruits in January, February, March, October and November.

Popular names: gitirana branca, maracujá, maracujá de estalo.

14. *Passiflora suberosa* L., Sp. Pl. 2: 958. 1753.

Fig. 6

Vine herbaceous. Stem cylindrical to flattened, striate, pubescent. Stipules 0.3–0.6 × 0.2–0.3 cm, persistent, linear, glabrous, apex acute, margin entire, non-glandular. Petioles 0.6–2.5 cm long, pubescent, with a pair of glands stipitate at the median region of petiole, green. Leaf blade 6.3–8.2 × 2–3.3 cm, simple, entire, oval-lanceolate or 4.7–16.4 × 2.9–10 cm, 2–3 lobed, with central lobe prominent, lobes oval-lanceolate, central lobe 2.1–8 × 1.9–6.1 cm, lateral lobes 3.1–9.6 × 2–6 cm, sometimes presents polymorphism in the

same individual, membranaceous, pubescent, apex acute, base rounded, margin undulate, penninerved or 3-nerved, glands absent, ocelli absent. Pedicel 2.1–2.4 cm long, tomentose; bracts 0.3–0.5 cm long, linear, apex acute, base truncate, sessile, margin entire, caducous, tomentose, glands absent. Flowers 2–2.2 cm diam., inflorescence biflorous, calyx tube campanulate; sepals 0.7–0.9 × 0.2–0.4 cm, oblong, apex acute or obtuse, without horn, membranaceous, adaxial surface glabrous, abaxial surface tomentose, adaxial and abaxial surface green; petals absent; filaments of the corona arranged into two series, external serie 0.3–0.5 cm long, internal serie 0.1–0.2 cm long, both green-yellowish; nectariferous ring present; androgynophore 0.2–0.3 cm long; filaments 0.2–0.3 cm long, green, anthers ca 0.2 cm long, styles 0.2–0.3 cm long, green, stigma ca. 0.1 cm long; ovary ca. 0.1 × 0.2 cm, ovoid, glabrous. Berry 1.1–1.6 cm diam., globose, pericarp smooth, glabrous, black when mature, ocelli sometimes presents, white; seeds 0.2–0.4 × ca. 0.2 cm, cordate, alveolate.

Examined material: Guaramiranga, 04°26'33"S, 38°93'31"W, 9.VI.2012, fl. and fr., *A.S.F. Castro 2651* (EAC). Ibiapina, beira da estrada, 03°54'10"S, 40°52'37"W, 17.IV.2010, fr., *M. Milward-de-Azevedo & D.J.L. Souza 177* (UEC, ALCB). Pacoti, Pico Alto, 04°21'36"S, 38°97'91"W, 12.VIII.2012, fr., *M.L. Guedes et al. 19274* (EAC, ALCB).

Passiflora suberosa characterized by having leaves 3-lobed, being central lobe prominent, inflorescence biflorous, small diameter (2–2.2 cm), thick sepals, green, without petals and black berry when mature.

It was found in all Tropical America (Killip 1938b). In Brazil it has occurrence confirmed in all regions (BFG 2018; Flora do Brasil 2020 under construction). In Ceará state it has restricted distribution and occurs in three municipalities. It was recorded in the Semideciduous Seasonal Forest (Mata Seca) and Dense Ombrophilous Forest (Mata Úmida) (Fig. 6), at altitudes between 901–1,078 m.

The species is collected with flowers in June and with fruits in March, April, May, June and August.

14.1. *Passiflora suberosa* subsp. *litoralis* (Kunth) Port.-Utl. ex M.A.M. Azevedo, Baumgratz & Gonç.-Estev., Phytotaxa 53: 47. 2012.

Figs. 6; 7g-i

It has calyx tube patelliform, sepals adaxial surface of yellow, filamentos of the corona arranged

into two series, external serie green-purplish, internal serie purple.

Examined material: Crato, trilha do Granjeiro, 07°16'50"S, 39°26'20"W, 13.III.20, fl. and fr., *F.G.L.S. & L.S. Cordeiro 69* (HCDAL). Guaramiranga, estrada para o Pico Alto, 04°20'93"S, 38°96'73"W, 24.IV.2010, fl. and fr., *M. Milward-de-Azevedo & D.J.L. Souza 211* (UEC). Missão Velha, Sítio Pinheira, 07°25'19"S, 39°07'43"W, 13.VII.2019, fl. and fr., *F.G.L.S. Souza & V.L. Sampaio 39* (HCDAL). Tianguá, Sítio Santa Maria, 03°77'71"S, 40°92'70"W, 19.IV.2010, fr., *M. Milward-de-Azevedo & D.J.L. Souza 184* (UEC). Ubajara, Sítio Buriti, estrada para Ubajara, 03°84'75"S, 40°89'05"W, 19.IV.2010, fr., *M. Milward-de-Azevedo & D.J.L. Souza 192* (UEC).

It occurs in Mexico, Costa Rica, Guatemala, Honduras, Nicaragua, Venezuela, Colombia, Ecuador, Peru, Bolivia, Brazil, Paraguay, and Argentina, and introduced in the Old World (Milward-de-Azevedo *et al.* 2012). In Brazil, it has record in all regions (BFG 2018; Flora do Brasil 2020 under construction). In Ceará state it has restricted distribution and occurs in five municipalities. It was recorded in the Semideciduous Seasonal Forest (Mata Seca), Dense Ombrophilous Forest (Mata Úmida) and Arboreous Stepic Savanna (Caatinga Arbórea) (Fig. 6), at altitudes between 746 a 921 m.

The species flowers in March, April, July and fruits in March, April and July.

15. *Passiflora subrotunda* Mast., *Fl. bras.* 13(1): 601. 1872. Figs. 6; 7j-k

Vine woody. Stem cylindrical, striate, glabrous. Stipules 1.2–2.2 × 0.7–2 cm, persistent, ovate-lanceolate, glabrous, entire, apex acute, mucronate, margin entire. Petioles 1–1.4 cm long, glabrous, with a pair of glands stipitate at the median region of petiole, green. Leaf blade 2.4–4.7 × 2.2–4.9 cm, simple, entire, cordate, membranaceous, glabrous, apex emarginate, mucronate, base cordate, margin entire to undulate, 3-nerved, glands sometimes present, ocelli absent. Pedicel 1.6–3 cm long, glabrous; bracts 0.6–0.8 × 0.4–0.5 cm, ovate-lanceolate, apex acuminate, base obtuse, sessile, margin entire, persistent, glabrous, glands absent. Flowers 3.5–4.3 cm diam., solitary, calyx tube campanulate; sepals 2.5–2.8 × 0.3–0.4 cm, linear, apex obtuse, with a horn, membranaceous, glabrous, adaxial and abaxial surface purple; petals 1.5–1.8 × 0.2–0.3 cm, linear, apex obtuse, membranaceous, adaxial and abaxial surface purple; filaments of the corona arranged into two series, external serie 1.5–1.7 cm

long, internal serie 1.1–1.2 cm long, mixture of the colors purple, white and blue; nectariferous ring absent; filaments 0.6–0.7 cm long, with purple spots, anthers 0.3–0.4 cm long, styles 0.3–0.6 cm long, purple, stigma ca. 0.2 cm long; ovary 0.1–0.5 × 0.2–0.3 cm, ovoid, glabrous. Berry 1.5–2.3 × 1.1–1.3 cm, ovoid, pericarp smooth, glabrous, orange when mature, ocelli absent; seeds ca. 0.4 × 0.3 cm, ovate, foveolate.

Examined material: Aquiraz, 4.XI.1992, fl., *L.P. Félix 5507* (HST, EAN). Beberibe, Morro Branco, 04°15'55"S, 38°10'90"W, 21.IV.2010, fl., *M. Milward-de-Azevedo & D.J.L. Souza 194* (UEC). Camocim, praia do Farol, 02°90'22"S, 40°84'11"W, 14.X.2018, fl. and fr., *E.B. Souza et al. 5556* (HUVA). Caucaia, Área de Proteção Ambiental Lagamar do Cauípe, 03°60'48"S, 38°78'16"W, 1.XI.2014, fl. and fr., *F.R.S. Tabosa 05* (EAC). Eusébio, Área de Proteção Ambiental do Rio Pacoti, 03°83'18"S, 38°39'83"W, 16.VIII.2018, fl. and fr., *S.T. Rabelo 62* (EAC). Fortaleza, dunas de Papicu, 26.I.1968, fl., *J.S. Sobrinho 405* (HST). Icapuí, Área de Proteção Ambiental de Ponta Grossa, 8.IX.2000, fl., *Lima et al.* (EAC 30410). Itaipoca, praia da Baleia, 3.IX.2010, fr., *M.F. Mata 2168* (HUVA). Jijoca de Jericoacoara, Área de Proteção Ambiental de Jericoacoara, Serrote, 7.III.1997, fl. and fr., *L.Q. Matias* (EAC 25000). São Gonçalo do Amarante, X.2007, fl., *M.F. Moro et al. 256* (EAC). Trairi, área de dunas, área interdunares, 23.IX.1999, fl., *L.Q. Matias et al. 120* (EAC).

Passiflora subrotunda is distinguished by having ovate-lanceolate stipules, sepals and petals linear, purple, filaments of the corona mixture of the colors purple, white and blue, purple styles, ovoid berry and orange when mature.

Species with confirmed occurrence to Northeast region of the Brazil in the Caatinga and Atlantic Forest phytogeographic domains (BFG 2018; Flora do Brasil 2020 under construction). In Ceará it has broad distribution, collected in 11 municipalities. It was found in the Vegetation Complex of the Coastal Zone (Pioneer Psamophilous Vegetation/Forest behind the Dunes/Lowland Semideciduous Forest- Mata de Tabuleiro) (Fig. 6), at altitudes between two to 32 m. It occurs in four Conservation Units do Estado: Lagamar do Cauípe Environmental Protection Area, Rio Pacoti Environmental Protection Area, Jericoacoara Environmental Protection Area and Ponta Grossa Environmental Protection Area. It was found frequently on dunes or near to these.

The species is collected with flowers and fruits practically all year.

Popular names: maracujá, maracujá do mato.

16. *Passiflora transversalis* M.A. Milward-de-Azevedo, Brittonia, 60:4. 2008. Fig. 6

Vine herbaceous. Stem flattened, striate, pubescent. Stipules 1–3 cm long, caducous, linear, pubescent, apex acute, margin entire, non-glandular. Petioles 0.8–1.5 cm comp., pubescent, non-glandular. Leaf blade 1–1.6 × 4.5–5.9 cm, simple, 2–3 lobed with central lobe atrophied, central lobe 0.2–0.4 × 0.7–1.2 cm, lateral lobes 2.8–3.4 × 0.9–1.3 cm, lobes oblong, membranaceous, pubescent, apex central lobe acute, acuminate, apex lateral lobes acute or rounded, base truncate, margin entire, 2–3 nervada, glands absent, 5–8 ocelli along the leaf blade. Pedicel 2.3–3.1 cm long, pubescent; bracts 0.3–0.4 cm long, linear, apex acute, sessile, margin entire, caducous, pubescent, glands absent. Flowers 2.7–3.2 cm diam., solitary, calyx tube campanulate; sepals 1.3–1.6 × 0.3–0.4 cm, lanceolate, apex obtuse, with a horn, thick, glabrous, adaxial and abaxial surface white; petals 1.1–1.4 × 0.2–0.3 cm, lanceolate, apex acute, membranaceous, adaxial and abaxial surface white; filaments of the corona arranged into two series, green, external serie 0.6–1.4 cm long, internal serie 0.2–0.5 cm long; nectariferous ring present; androgynophore 0.5–0.8 cm long; filaments 0.2–0.6 cm long, green, anthers 0.2–0.5 cm long, styles 0.2–0.6 cm long, green, stigma 0.1–0.2 cm long; ovary 0.2–0.3 × 0.1–0.2 cm, oblong, pubescent. Berry ca. 0.8 cm diam., globose, pericarp smooth, pubescent, black when mature, ocelli absent; seeds ca. 0.3 × 0.2 cm, ovate, transversally sulcate.

Examined material: Ubajara, Parque Nacional de Ubajara, caminho da Gruta de Ubajara, 27.I.1968, fl. and fr., *A. Castellanos 26908* (HB).

Additional material examined: BRAZIL. PARANÁ: Ponta Grossa, Rio Guabiroba, 14.VI.1994, fl., *J. Cordeiro & E. Barbosa 1185* (HUEFS, MBM). RIO GRANDE DO SUL: Cachoeira do Sul, km 272, Capané, 30°16'27"S, 52°57'03"W, 2.III.2002, fl., *A.P. Lorenz* (ICN 12630). Porto Alegre, Lami, 9.VI.1973, fr., *A.R. Schultz & L.R. Baptista* (ICN 12582).

Passiflora transversalis is characterized principally by its flattened stem, leaves 2–3 lobed with central lobe atrophied, petioles non-glandular, white flowers, filaments of the corona green, pubescent berry and black when mature.

The species present disjunct distribution in Brazil, with records in the South and Southeast regions with distribution limit in the state of Minas Gerais, in the Northeast region it has occurrence only in Ceará state, in the Cerrado and Atlantic Forest phytogeographic domains (BFG 2018; Flora

do Brasil 2020 under construction). In Ceará territory it has restricted distribution, considered rare by having one record only in the municipality of Ubajara. It occurs in one Conservation Unit of Ceará state: Ubajara National Park, in the Dense Ombrophilous Forest (Mata Úmida) (Fig. 6).

The species flowers and fruits in January.

17. *Passiflora tricuspis* Mast., *Fl. bras.* 13(1): 587. 1872. Fig. 6; 7I

Vine herbaceous. Stem flattened, striate, glabrous. Stipules 0.2–0.7 cm long, persistent, linear, glabrous, apex acute, margin entire, non-glandular. Petioles 1.8–3.9 cm long, glabrous, non-glandular. Leaf blade 6–15 × 7.5–14 cm, simple, 3-lobed, central lobe 4.2–9.2 × 1.7–3.8 cm, lateral lobes 6–12.5 × 2–3.9 cm, lobes oblong, chartaceous, glabrous, apex acute, obtuse or rounded, base obtuse, margin entire, 3-nerved, adaxial surface green with white spot, abaxial surface purple, glands absent, two ocelli at the base and 13–15 along the leaf blade. Pedicel 4.5–5 cm long, glabrous; bracts 0.1–0.3 × 0.1–0.2 cm, linear, apex acuminate, base truncate, sessile, margin entire, persistent, glabrous, glands absent. Flowers 3.2–4 cm diam., solitary, calyx tube campanulate; sepals 1.1–1.4 × 0.3–0.4 cm, oblong, apex obtuse, without horn, membranaceous, glabrous, adaxial and abaxial surface white; petals 0.7–0.9 × 0.2–0.3 cm, oblong, apex obtuse, membranaceous, adaxial and abaxial surface white; filaments of the corona arranged into two series, external serie 0.9–1.1 cm, internal serie long, 0.6–0.7 cm long, white; nectariferous ring absent; filaments 0.4–0.6 cm long, green, anthers ca. 0.4 cm comp., styles 0.4–0.5 cm long, green, stigma ca. 0.1 cm long; ovary 0.3–0.5 × 0.2–0.4 cm, elliptical, glabrous. Berry 1.3–1.8 cm, globose, pericarp smooth, glabrous, black when mature, ocelli absent; seeds 0.3–0.4 × 0.1–0.2 cm, elliptical, transversally sulcate.

Examined material: Crato, Floresta Nacional do Araripe-Apodi, Guaribas, 07°23'41"S, 39°40'94"W, 14.I.1999, fl. and fr., *A.M. Miranda & D. Lima 3139* (HST). Guaramiranga, Parque das trilhas, 04°26'99"S, 38°93'46"W, 24.IV.2010, *M. Milward-de-Azevedo & D.J.L. Souza 198* (UEC). Itapipoca, maciço de Uruburetama, serra de Itacoatiara, 3.VI.2015, fl. and fr., *F.D. Santos 366* (HUYA). Ubajara, Sítio do Alemão, trilha para o Mirante, 03°84'71"S, 40°88'85"W, 18.IV.2010, fl., *M. Milward-de-Azevedo & D.J.L. Souza 178* (UEC).

Additional material examined: BRAZIL. MATO GROSSO DO SUL: Antônio João, 5 km O, 15.III.1985,

fl., *G. Hatschbach & F.J. Zilma 49044* (MBM). SÃO PAULO: Pindorama, Fazenda Ribeiro, ao lado da estação do IAC, 21°14'26"S, 48°53'03"W, 16.IV.1994, fr., *V.C. Souza et al. 5779* (ESA).

Passiflora tricuspis is distinguished by having flattened stem, ocelli presents along the leaf blade, linear bracts, flowers and filaments of the corona white, black berry and seeds transversally sulcate.

It occurs in Peru, Bolivia, Brazil, and Paraguay (Milward-de-Azevedo *et al.* 2012). In Brazil it has records in all regions of the country and to Northeast region it has confirmed occurrence to states of Bahia, Ceará and Piauí (BFG 2018; Flora do Brasil 2020 under construction). In Ceará it has restricted distribution and occurs in four municipalities and it was found in the Dense Ombrophilous Forest (Mata Úmida) and Stepic Savanna (Caatinga/Carrasco) (Fig. 6), at altitudes between 730–925 m. It was recorded in two Conservation Units of State: Araripe-Apodi National Forest and Ubajara National Park.

The species is collected with flowers in January, April and June, with fruits in January, March and June.

Popular name: maracujá de estalo.

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