

Taxonomy of Subfamily Caesalpinioideae (Fabaceae Lindl.) In Cerrado Fragment In The East From Maranhão, Northeast From Brazil

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Abstract: The objective of this research was to present a taxonomic treatment of the subfamily Caesalpinioideae (Fabaceae) in a Cerrado fragment in East from Maranhão, in Northeast Brazil. The Cerrado area sampled belongs to the municipality of São João do Sóter/Maranhão, in the East region of the State, where monthly expeditions were carried out between September 2016 and February 2017, for the observation, collection and identification of botanical material. After collection the specimens were herborized and analyzed with the help of taxonomic keys and specialized literature for identification, and consultation with specialists in the family. In the research were cataloged 12 genera, distributed in 19 species, the genus *Mimosa* L. being the most representative. The work provides description, geographic distribution and phytogeographic domains of the species for Brazil and identification key for the taxa. In this way the research contributed with the addition of botanical information to the Subfamily Caesalpinioideae in the Northeastern region of Brazil and Maranhão, serving as subsidies to fill the gaps of biodiversity in the Fabaceae family.

Keywords: Biodiversity, Geographical distribution, Legumes, *Mimosa*.

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I. Introduction

Fabaceae is one of the largest botanical families in the world, being only surpassed by Asteraceae and Orchidaceae in number of species, is constituted by 770 genera and 19,500 taxa, occurring in practically all the world's ecosystems^{1,2}. The family is the most diverse in number of trees in the world³ and the largest in number of species in the Amazon Forest, one of the largest phytogeographic domains from Brazil⁴.

In Brazil, was recognized 2848 species (1539 endemic) agrouped in 222 genera, distributed in the Northeast of the country in 171 genera and 1109 species and for the state of Maranhão the numbers are reduced to 111 genera and 408 taxa⁵. Currently the family is circumscribed in six subfamilies: Papilionoideae (503 genera and 14000 species); Caesalpinioideae (146 genera and 4400 species); (12 genera and 335 species) and Duparquetioideae (1 genus and 1 species), with the inclusion of the previous subfamily Mimosoideae, within the clade of Caesalpinioideae².

Caesalpinioideae is recognized for having rarely bilateral or symmetrically radial flowers, inner median petal (standard), or valvular petals (in the mimosoid clade); free or cast sepals; seeds without complex hilar valves, with or without pleurogram; radicle of the embryo generally straight, bipinnates leaves; Inflorescences mainly with spiral racemes, commonly composed in branched panicles or arranged in spikes or fascicles; leaves usually paripinnates with opposite leaflets, rarely bifoliolates; extra-floral nectaries (when present) on the petiole or leaf rachis between leaflet pairs².

The Caesalpinioideae subfamily has Pantropical distribution and is easily recognized by the great morphological and reproductive variability⁶. As for the distribution in Brazil, it is represented by approximately 52 genera and 810 species⁷. With the new classification of Fabaceae, Caesalpinioideae has aggregated many taxa, increasing its richness and distribution, and it is necessary to characterize the composition of this group in

priority areas as areas of the eastern Maranhão state, which have few floristic surveys generating gaps on the knowledge of the biodiversity of Caesalpinioideae. In this context the research aimed to present a taxonomic treatment of the subfamily Caesalpinioideae (Fabaceae) in a Cerrado fragment in the East region of the State of Maranhão.

II. Material And Methods

Maranhão occupies 331,983.29 km² of Brazilian territory, being the eighth largest state in Brazil and the second largest in the Northeast in territorial extension⁸. The municipality of São João do Sóter, is located in the East of Maranhão, with an area of 1,438.1 km² and 17,238 inhabitants in the last census. Located at 108 meters of altitude, in the following geographical coordinates: 5 ° 6 '28' 'S. and 43 ° 48' 34 " W (Fig. 1) ⁹.

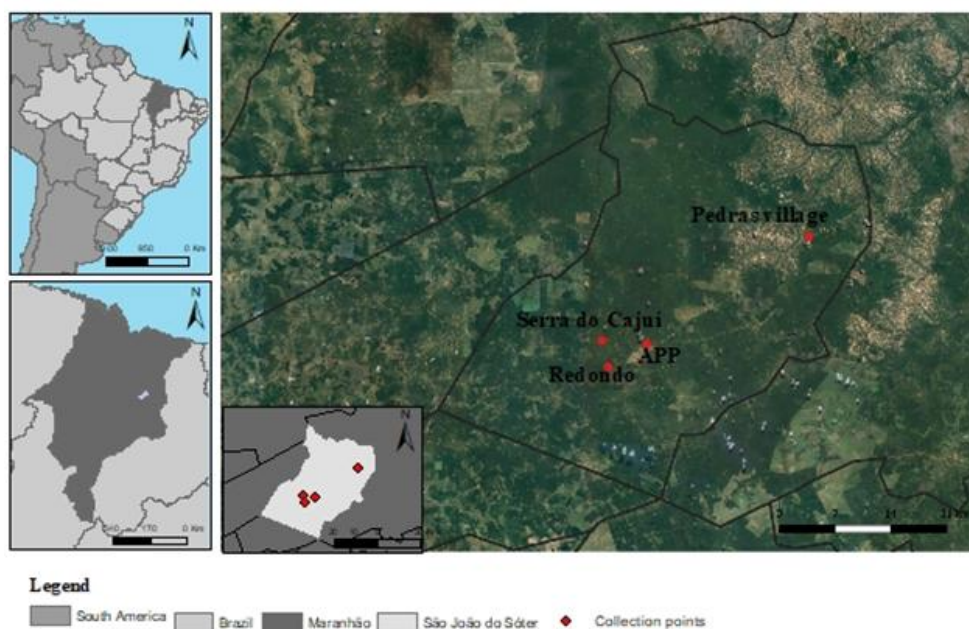


Figure 1. Map of the Municipality of São João do Sóter, Maranhão/Brazil. Source: IBGE; 2006, Google Earth 2014

Fieldwork was carried out between September 2016 and February 2017, where monthly expeditions were carried out through the active search method for observation, collection and identification of botanical material. The material collected in the field was obtained during the reproductive stage. For each specimen collected, a series of annotations were taken, such as: date and place of collection (locality, municipality, state and geographic coordinates), name of collector, and physical characteristics of the environment (such as slope, soil type, of watercourses, etc.).

Regarding the characteristics of the plant and the collection itself, it was noted: plant habit, height, bark characteristic, color and texture of leaves, flowers and fruits and other striking features that aided the identification stage. Morphological analyzes were carried out in the laboratory with the aid of stereomicroscopes, where the specimens were identified by comparison with the type material, specialized bibliography such as ^{1,10,11,12}, virtual herbarium and taxonomic keys following the classification of ^{13,2} and sending samples to specialist in the group for confirmation of the species. The analyzed material was herborized with usual techniques and after the identification of the species and assembly of the exsiccates, they were incorporated in the Herbarium Prof. Aluizio Bittencourt (HABIT).

With the identification of the taxa, the genera, species and life habits were more representative in the survey, besides indicating physiognomy of the collection and phytogeographical domains of occurrences of the species in Brazil. In order to analyze the geographic distribution of the species, a geographic occurrence table of the taxa was elaborated in the Brazilian states, where Dispersion and Clustered plots were generated using the statistical program SPSS Statistics (*Statistics Base 22*). In the clustered column diagram was evaluated the grouping of the data from the geographic distribution of the species, observing the taxa (columns) with higher and lower distribution generating a percentage, and the dispersion diagram evaluated if the distribution data of the species establish relation, and what trend this relationship has from the geographical distribution.

Finally, a taxonomic treatment of the species cataloged together with the information of author of the species, *Opera princeps*¹⁴ and botanical description of the taxa was elaborated, elaborating a dichotomous

taxonomic key of the described species, using the taxonomic criteria already presented in the botanical description, which better identifies the species studied.

III. Results And Discussion

The Caesalpinioideae subfamily was represented by 12 genera and 19 species (Table 1). The genus *Mimosa* L. was the most representative, with four species. *Mimosa* L. comprises approximately 536 species, but works as:^{15,16,17,18,19} described new species. It is distributed mainly in the neotropical region, counting on approximately 496 endemic taxa of the Neotropics and 40 native species of the old world^{20,21}.

In representative species, *Libidibia ferrea* (Mart. Ex Tul.) L.P Queiroz, *Plathymenia reticulata* Benth. and *Chamaecrista flexuosa* (L.) Greene, were the most representative, with three specimens each. These species have a wide geographical distribution and have records in most of the phytogeographic domains of Brazil^{5,22,23}.

The most representative growth habit was the tree type, with eleven species, followed by the shrub habit with five species. The growth habit of the subfamily Caesalpinioideae is varied, ranging from trees, shrubs, sub-shrubs to upright herbs, creepers or even creepers². As for the environment where the species were collected, it was observed that the most representative was the gallery forest type with ten species, then Cerrado limpo and open field with six and three species respectively. The physiognomy of gallery forest is characterized by being associated with water courses, and this formation, although small, possesses richness, genetic diversity and acts in the protection of water resources²⁴.

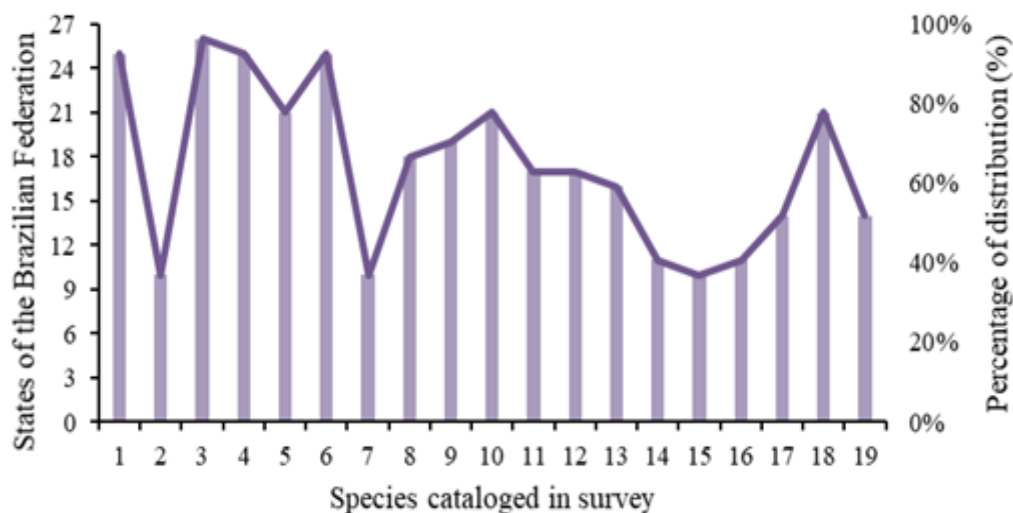
The state of Maranhão, despite having some published floristic lists, has many knowledge gaps, being only the 19th state in floristic richness of Brazil⁷, appearing in the Brazilian scenario as one of the most biodiverse areas estimated, but not cataloged²⁵. Records new occurrences of species of Papilionoideae (Fabaceae) f to the state of Maranhão, demonstrating that the Cerrado of Maranhão has a floristic richness still little known²⁶.

Table 1. List of species of Fabaceae (Caesalpinioideae) registered for the municipality of São João do Sóter/Maranhão/Brazil.

Nº	SPECIES	HABIT OF LIFE	PHYTOGEOGRAPHICAL DOMAIN
1.	<i>Caesalpinia pulcherrima</i> (L.) Sw.	Tree	Amazon, Cerrado and Atlantic Forest
2.	<i>Cenostigma macrophyllum</i> Tul.	Tree	Amazon, Caatinga and Cerrado
3.	<i>Chamaecrista flexuosa</i> (L.) Greene.	Sub- shrub	Amazon, Caatinga, Cerrado, Atlantic Forest, Pampa and Pantanal
4.	<i>Chamaecrista nictitans</i> (L.) Moench.	Herb	Amazon, Caatinga, Cerrado, Atlantic Rainforest and Pantanal
5.	<i>Chamaecrista rotundifolia</i> (Pers.) Greene.	Herb	Amazon, Caatinga, Cerrado, Atlantic Forest, Pampa and Pantanal
6.	<i>Delonix regia</i> (Bojer ex Hook.) Raf.	Tree	Amazon, Caatinga, Cerrado, Atlantic Rainforest and Pantanal
7.	<i>Dimorphandra gardneriana</i> Tul.	Tree	Caatinga and Cerrado
8.	<i>Inga edulis</i> Mart.	Tree	Amazon, Caatinga, Cerrado and Atlantic Forest
9.	<i>Inga thibaudiana</i> DC.	Shrub	Amazon, Caatinga, Cerrado and Atlantic Forest
10.	<i>Mimosa caesalpinifolia</i> Benth.	Shrub	Amazon, Caatinga, Cerrado and Atlantic Forest
11.	<i>Mimosa pudica</i> L.	Shrub	Amazon, Caatinga, Cerrado and Atlantic Forest
12.	<i>Mimosa sensitiva</i> L.	Shrub	Amazon, Caatinga, Cerrado and Atlantic Forest
13.	<i>Mimosa xanthocentra</i> Mart.	Shrub	Amazon, Cerrado and Atlantic Forest
14.	<i>Parkia platycephala</i> Benth.	Tree	Amazon, Caatinga and Cerrado
15.	<i>Stryphnodendron adstringens</i> (Mart.) Coville.	Tree	Caatinga and Cerrado
16.	<i>Libidibia ferrea</i> (Mart. Ex Tul.) L.P Queiroz	Tree	Caatinga, Cerrado and Atlantic Forest
17.	<i>Plathymenia reticulata</i> Benth.	Tree	Amazon, Caatinga, Cerrado and Atlantic Forest
18.	<i>Senna multijuga</i> (Rich.) H.S. Irwin & Barneby.	Tree	Amazon, Caatinga, Cerrado and Atlantic Forest
19.	<i>Senna reticulata</i> (Willd.) H.S. Irwin & Barneby.	Tree	Amazon, Caatinga and Cerrado

As for the geographic distribution of species, it was observed with Clusterized column digrama (Fig. 1) that the 19 species cataloged in the survey have a wide geographic distribution in Brazil, where of the 27 States, only three species occur in 10 Brazilian states (37%), with the lowest distribution (*Cenostigma macrophyllum*, *Dimorphandra gardneriana* and *Stryphnodendron adstringens*). The most widely distributed species in Brazil was *Chamaecrista flexuosa*, occurring in 26 states (96.3%).

Figure 1. Cluster diagram with the geographic distribution to Brazil of the cataloged species of Caesalpinioideae in the East region from Maranhão/Brazil.



With the dispersion diagram it is observed that there is an upward relationship in the tendency line of the graph, demonstrating that the distribution tends to increase within the Brazilian states, that is, the linear trend is that the larger the number of species in the sample, the greater the geographical distribution. The analysis shows that the knowledge of biodiversity is associated with its geographic distribution, making conservation policies to be subsidized by coherent biological information, both from the taxonomic point of view (Linerian deficit) and from the biogeographical point of view (deficit Wallacian) ²⁷.

Figure 2. Dispersion diagram of the geographical distribution for Brazil of the cataloged species of Caesalpinioideae in the East from Maranhão/Brazil.

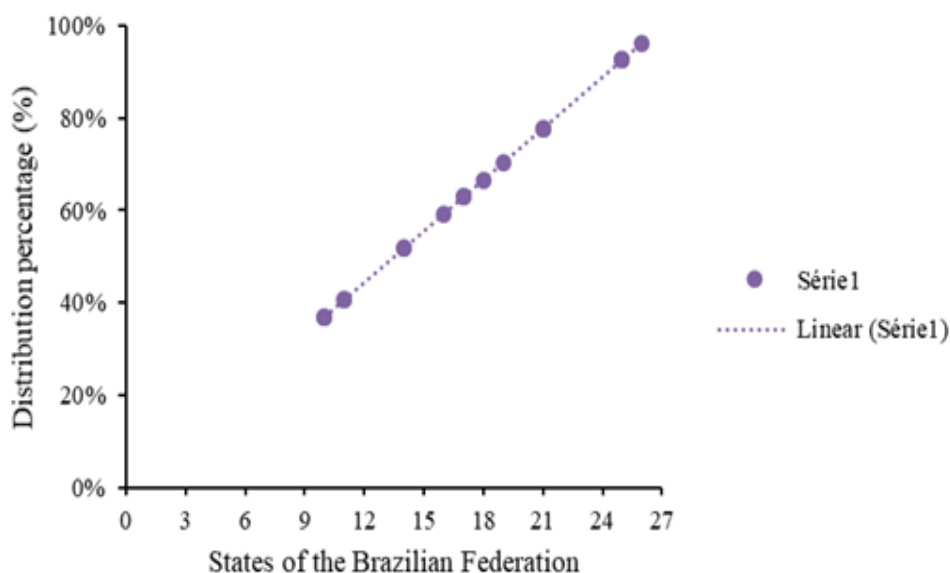


Table 2. Geographic distribution of Caesalpinioideae species (Fabaceae Lindl.) Cataloged in Northeast Brazil.

ESPECIES	UF	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
<i>Caesalpinia pulcherrima</i> (L.) SW.		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Cenostigma macrophyllum</i> TUL.						•	•	•	•	•	•	•	•	•						•								•	
<i>Chamaecrista flexuosa</i> (L.) Greene		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<i>Chamaecrista nictitans</i> (L.) Moench.		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Chamaecrista rotundifolia</i> (PERS) Greene.		•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Delonix regia</i> (Bojer) EX Hook. Raf.		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Dimorphandra gardneriana</i> Tul.						•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Inga edulis</i> Mart.		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Inga thibaudiana</i> DC.		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Mimosa caesalpinifolia</i> Benth.					•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Mimosa pudica</i> L.					•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Mimosa sensitiva</i> L.					•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Mimosa xanthocentra</i> Mart.					•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Parkia platycephala</i> Benth.						•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Stryphnodendron adstringens</i> (Mart.) Coville.						•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Libidibia ferrea</i> (Mart. Ex Tul) L.P Queiroz			•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Plathymenia reticulata</i> BENTH.						•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Senna multijuga</i> (RICH.) H.S. Irwin & Barneby.		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<i>Senna reticulata</i> (WILLD.) H.S. Irwin & Barneby.		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	

Subtitle. 1. Acre-AC; 2. Alagoas-AL; 3. Amapá-AP; 4. Amazonas-AM; 5. Bahia-BA; 6. Ceará-CE; 7. Distrito Federal-DF; 8. Espírito Santo-ES; 9. Goiás-GO; 10. Maranhão-MA; 11. Mato Grosso-MT; 12. Mato Grosso do Sul-MS; 13. Minas Gerais-MG; 14. Pará PA; 15. Paraíba-PB; 16. Paraná-PR; 17. Pernambuco-PE; 18. Piauí-PI; 19. Rio de Janeiro-RJ; 20. Rio Grande do Norte-RN; 21. Rio Grande do Sul-RS; 22. Rondônia-RO; 23. Roraima-RR; 24. Santa Catarina-SC; 25. São Paulo-SP; 26. Sergipe-SE; 27. Tocantins-TO.

KEY OF SUBFAMILY CAESALPINIOIDEAE

1. Herb, shrub or tree with leaves always bipinnates with inflorescence of the glomerule or raceme type.....2
 2. Trees with more than 10 m in height, always woody stem.....3
 3. Puberulent rusty branches, lower crown, 30 to 45 leaflets per leaf, apex of rounded leaflet, leaflet with 0.4 cm of length. and 0.1 cm wide..... **1** *Stryphnodendron adstringens*
 3. Grayish, not pubertal branches, high crown, 35 to 50 leaflets per leaf, apex of acute leaflet, leaflet with 0.6 cm of length. and 0.2 cm long..... **2.** *Parkia platycephala*
2. Herbs or subshrub less than 10 m high, woody or herbaceous stem.....4
 4. Individuals less than 1m in height, small leaflets less than 1cm in length and less than 0.5cm in width.....5
 5. Symmetrical lanceolate leaflets, dry fruit type crusty, 1.5 cm long and 0.3 cm wide.....**3** *Mimosa pudica*
 5. Leaflets oblong-lanceolates, fruit legume dry with indumentum, with 9 cm of comp. and 0.3cm wide.....**4** *Mimosa xanthocentra*
 4. Individuals over 1m in height, large leaflets larger than 1cm in length and more than 0.5cm wide.....6
 6. Leaflets tetrafoliolates, asymmetric, 2 pairs of leaflets for leaf, dry fruit of the craspedium type, with approximately 2,5cm of length. and 0.3 cm long.....**5** *Mimosa sensitiva*
 6. Leaflets symmetricals, with 6 to 12 pairs of leaflets for leaf, fruit, legume, with 5cm of length. and 0.3cm wide.....**6** *Mimosa caesalpinifolia*
1. Herb, shrub, or trees with leaves bipinnates or imparipinnates with inflorescences type raceme, never glomerule.....7
 7. Tree or shrub, with woody stem..... 8
 8. Trees with pubertals branches..... 9

9. Stipules rudimentary or without the presence of nectary, fruit of the legume type with falcate apex..... **7 *Cenostigma macrophyllum***
9. Sticks not rudimentary or with the presence of nectary, legume fruit without falcate apex..... 10
10. Winged petiole with petiole nectary..... 11
11. Nectary greater than 2mm, rounded longitudinal at the base of the rachis petioles..... **8 *Inga edulis***
11. Nectary less than 2mm, rounded not longitudinal at the base of the rakers petiole..... **9 *Inga thibaudiana***
10. Absence of winged petiole, absence of nectary petiole..... 12
12. Presence of long stipules in the shape of an orange sickle, with leaflets 10 cm long. and 4.2 cm long..... **10 *Senna reticulata***
12. Presence of small elongated stipules, leaflets 6.7 cm long, and 2.6 cm long..... **11 *Senna multijuga***
8. Trees with glabrous branches a little puberulent..... 13
13. Inflorescence raceme with red or yellow flowers..... 14
14. Flowers with red petals, lush banner, legume 10 cm..... **12 *Delonix regia***
14. Flowers with yellow petals with reddish banner..... **13 *Libidibia ferrea***
13. Inflorescence not raceme with green or white flowers..... 15
15. Inflorescence with more than 10 racemes, green with presence of stamens and staminoids..... **14 *Dimorphnadra gardneriana***
15. Inflorescence with less than 10 racemes, white without the presence of stamens and staminoids..... **15 *Plathymenia reticulata***
7. Subshrub or herb..... 16
16. Presence of aculeus in the branches, showy red flowers, legume fruit with long apex..... **16 *Caesalpinia pulcherrima***
16. Absence of aculeus in the branches, luxuriant flowers, legume fruit without long apex..... 17
17. Prostrate growth, bipinnates leaves, legume fruit with 2 to 3 items..... **17 *Chamaecrista nictitans***
17. Growth creep or erect decumbent, bifoliolates leaves, legume fruit with more than 3 items..... 19
18. Creeping growth, leaflets 3.2 cm in length. and 3 cm long, linear type fruit with 2.2 cm long and fruit petiole extended with 1.5 cm of comp..... **18 *Chamaecrista rotundifolia***
18. Decumbent erect growth, leaflets with 4 cm of length. and 1.2 cm long, a linear fruit legume type of 4.5 cm length with fruit petiole not very extended with 0.5 cm of length..... **19 *Chamaecrista flexuosa***

DESCRIPTION OF SUBFAMILY CAESALPINIOIDEAE

1. *Stryphnodendron adstringens* (Mart.) Coville (Century Dict.) 11: 111, 1910.

Common Name: Barbatimão

Specie description: Tree with woody trunk fissured with approximately 10m of height, sympodial growth, branches blackish parts, absence of stipules, inerms, cylindrical, glabrescent branches, glandular trichomes in the branches with 0.3 cm of length. 0.4 inches long. composites bipinnates leaves, alternating between 5,5 cm of length. and 0.3 of long, deciduous, presents of 30 to 45 pairs of leaflets, leaflets with 0.4 cm of lengthlength. and 0.1 cm wide, rounded apex, smooth margin, paraleinnerved vein, absent flower, absent fruit.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23/VI/17, G. S. Gomes; G. M. Conceição, 43 (HABIT).

Geographical distribution: North (Tocantins); Northeast (Bahia); Center-West (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso); Southeast (Minas Gerais, São Paulo); South (Paraná) (Flora do Brasil 2020).

2. *Parkia platycephala* Benth. J. Bot. (Hooker) 4 (30): 329, 1841.

Common Name: Faveira-de-bolota, Visgueiro.

Specie description: Tree with woody stem, sympodial growth of tall crown with 15m of height, grayish branches, abstact stipules, composite bipinnates leaves, presence of 35 to 50 pairs of leaflets, spiral alternate

phyllotaxy, diminutive lanceolate leaflets, 6cm of length. and 0.2 cm wide, petiole with 7 cm, long leaves with 19.5 cm showing pulvinus, whole margin, acute leaf apex, penninerved vein, cuminous inflorescence, dry fruit type legume, with approximately 10 cm of length and 2.5 cm wide.

Material Examined: Brazil. Maranhão: São João do Sóter, Permanent Protection Area, 08/X/16, G. S. Gomes; G. M. Conceição, 4 (HABIT).

Geographic Distribution: North (Pará, Tocantins); Northeast (Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte); Center-West (Distrito Federal, Goiás, Mato Grosso) (Flora do Brasil 2020).

3. *Mimosa pudica* L. Gard. Dict. (Ed. 8) no. 4, 1768.

Common Name: Dormideira, Sensitiva, Dorme-dorme, Mulher-fecha-porta, Malícia-de-mulher.

Specie description: Shrub with woody stem, it presents 20 cm of height, aculeous in the form of sickle with 0,5cm of length, and 0.2 mm long, bipinnates composite leaves with 6 to 10 pairs of leaflets, 3,2 cm long pinnae, phyllotaxy alternate distical, lanceolate leaflet, with 0.9 cm of length, and 0.2 cm wide, 2.3 cm petiole, 3.9 cm leaf, whole margin, lanceolate leaf apex, paraleinnerved vein, glomerule cimose inflorescence, dichlamydeous, heterochlamydeous, zygomorphic symmetry, polystemone free stamens, pink color, fruit legume craspedium type, 1.5 cm long and 0.3 cm wide.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23/VI/17, G. S. Gomes; G. M. Conceição 42 (HABIT).

Geographic Distribution: North (Amazonas, Pará, Rondônia, Roraima); Northeast (Bahia, Maranhão, Pernambuco); Center-West (Distrito Federal, Mato Grosso do Sul, Mato Grosso); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo); South (Paraná, Rio Grande do Sul, Santa Catarina) (Flora Do Brasil 2020).

4. *Mimosa xanthocentra* Mart. Flora 21 (2, Biebl.): 50.1838.

Common Name: Dorme-dorme

Specie description: Subshrub with approximately 60 cm of height, woody stem, prostrate sympodial growth, inermous, cylindrical branches, aculeous of 0,2cm length, and 0.2cm wide, on the stem; stiples with 0.3cm of length, and 0.2cm wide, triangular, alternate composite sheets with 2 cm long. and 0.4 cm wide, bipinnates, with 10 to 15 pairs of leaflets, petioles 0.2 cm in length, absent extraphleic nectaries; leaflets 0.7 cm in length and 0.4 mm long, oblong-lanceolate, flower absent, legume fruit with indumentum, indescent, with 9 cm of comp. and 0.3 cm wide.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23/VI/17, G. S. Gomes; G. M. Conceição, 41 (HABIT).

Geographic Distribution: North (Pará, Rondônia, Tocantins); Northeast (Bahia, Ceará, Maranhão, Piauí); Center-West (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso); Southeast (Minas Gerais, Rio de Janeiro, São Paulo); South (Paraná, Santa Catarina) (Flora do Brasil 2020).

5. *Mimosa Sensitiva* L. Sp. Pl. 1: 518, 1753.

Common Name: Malícia.

Specie description: Shrub with 2 m length, branched sympodial growth, woody stem, rudimentary aculeous branches present in every branch of the shrub with 0.2 cm of length, and 0.1 cm wide, greenish branches, tetrafoliolate composite leaves, alternate phyllotaxy, asymmetrical leaflets, unbalanced, 2.6 x 1.0 cm, petiole with 3.0 cm of length, leaf 5.6 cm, whole leaf margin, acute leaf apex, penninerved vein, cimose, spiky, white, flower absent, fruit craspedium type, with approximately 2,5cm of length. and 0.3 cm wide.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23/VI/17, G. S. Gomes; G. M. Conceição, 15, 39 (HABIT).

Geographic Distribution: North (Amazonas, Pará, Rondônia, Tocantins); Northeast (Alagoas, Bahia, Ceará, Maranhão, Pernambuco, Piauí, Rio Grande do Norte, Sergipe); Center-West (Distrito Federal, Mato Grosso do Sul, Mato Grosso); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo) (Flora do Brasil 2020).

6. *Mimosa caesalpiniiifolia* Benth. (J. Bot. (Hooker) 4 (31): 392, 1841.

Common Name: Unha de gato.

Specie description: Shrub with woody stem, with 3m height, branched sympodial growth, prostrate, grayish branches to blackened form rope, aculeous in sickle were present with 0.8cm of length and 0.2cm wide. bipinnates composite leaves with 6 to 12 pairs of pinnae, alternate phyllotaxy, ovate leaflet, 2.6 cm long and 1.6 cm wide, petiole with 0.2 cm of length, leaf approximately 8.0 cm, whole margin, rounded leaf apex, penninerved groove, cumin-shaped, spiky inflorescence, white coloring, absent flower, legume fruit, with 5cm of legth. and 0.3cm wide.

Material Examined: Brazil. Maranhão: São João do Sóter, Permanent Protection Area, 08/X/16, G. S. Gomes; G. M. Conceição, 13, 14 (HABIT).

Geographical Distribution: North (Amazonas, Pará, Rondônia); Northeast (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte); Center-West (Distrito Federal, Goiás, Mato Grosso do Sul); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo); South (Paraná, Santa Catarina) (Flora do Brasil 2020).

7. *Cenostigma macrophyllum* Tul. Ann. Sci. Nat., Bot., Ser. 2, 20: 141, pl. 3, 1843.

Common Name: Caneleiro, Canela de Velho, Maraximbé or Fava do Campo.

Specie description: Tree with woody stem with approximately 10m of height, sympodial growth; rudimentary stipules present with 0.3 cm of length, with puberulent garments; petiole with approximately 3.0 cm of length, and 0.4cm wide; bipinnates composite leaves with 5 to 8 pairs of leaflets, alternate phyllotaxy, absence of nectaries, 13 cm length; ovate leaflets, 9.7 cm long, 2.6 cm long, whole leaf margin, mucronate leaf apex; flower absent and cimose inflorescence with floral buds with 0.9 cm of length; fruit of the fallow legume type, 12.7 cm long and 1.2 cm long.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23/VI/17, G. S. Gomes; G. M. Conceição, 27 (HABIT).

Geographical distribution: North (Tocantins); Northeast (Bahia, Ceará, Maranhão, Piauí); Center-West (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso); Southeast (Minas Gerais); South (Paraná) (Flora do Brasil 2020).

8. *Inga edulis* Mart. Flora 20 (2, Beibl.): 113-114, 1837.

Common Name: Ingá de metro

Specie description: Trees of 7m high, sympodial growth of low branch, woody stem, branches with attached structures, tomentose stipules, cylindrical pebbles of 0,2cm of length and 0,2 of width. winged deciduous, bipinnates composite leaves, with 3 to 8 pairs of leaflets, smooth margin, acute apex, penninerved vein, petioles with 0.4cm of length and 0.2cm wide, petiolate with 13.5cm of length, and 8 cm in length winged leaf 4.6 cm., nectary leaves of 0.1cm in length and 0.1 of width. broad, concave, sessile in the circular shaped stem, absent flowers and absent fruits.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23 / VI / 17, G. S. Gomes; G. M. Conceição, 37, 38 (HABIT).

Geographical distribution: North (Acre, Amazonas, Amapá, Pará, Rondônia, Roraima); Northeast (Bahia, Paraíba, Pernambuco); Center-West (Mato Grosso); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo); South (Paraná, Santa Catarina) (Flora do Brasil 2020).

9. *Senna reticulata* (Willd.) H. S. Irwin & Barneby. Mem. New York Bot. Gard. 35: 458, 1982.

Common Name: Maria-mole, Mata-pasto.

Specie description: Tree with woody stem, approximately 5m high, sympodial growth, puberulent blackish branches, sickle type stipules, orange, present with 0.8 cm of length, and 0.3cm wide, composite leaves with 15 to 20 pairs of pinnas, spiral alternating phyllotaxy, oblong leaflets, 10 cm in length and 4.2 cm wide, petiole with 4.5 cm of length, leaf with approximately 18 cm, whole margin with emarginated leaf apex, penninerved vein, raceme inflorescence with several racemes produced, dioecious, complete, heterochlamydeous, dialystemonous, free stamens, fruit dehiscent legume, with 14 cm of length and 2.2 cm wide.

Material Examined: Brazil. Maranhão: São João do Sóter, Serra do Cajuí Village, 14/II/17, G. S. Gomes; G. M. Conceição, 22 (HABIT).

Geographic distribution: North (Acre, Amazonas, Amapá, Pará, Rondônia); Northeast (Bahia, Ceará, Maranhão, Pernambuco, Piauí); Center-west (Goiás, Mato Grosso); Southeast (Minas Gerais, São Paulo) (Flora do Brasil 2020).

10. *Senna multijuga* (Rich.) H.S. Irwin & Barneby Mem. New York Bot. Gard. 35: 492, 1982.

Common Name: Canafístula, Aleluia.

Specie description: Tree with woody stem, 7m high with sympodial growth, with grayish parts about 10m, grayish branches, composite leaves, 8 to 12 pairs of pinnas, petiole with up to 2 cm of length, and 0.9 cm wide, leaflets of 6.7 cm in length and 2.6 cm of length. petiolate, oblong, glabrous or puberulent tops, nectary 0.2 cm in length, the raceme spinal cord at the base of the petiole in the first jug; canaliculate petiole with 0.2 cm of length, and 0,1 of width., yellow dioecious flower, complete (sepals and petals), dichlamydeous, heterochlamydeous, dialystemonous, free stamens, absent fruit.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23/VI/17, G. S. Gomes; G. M. Conceição, 25, 26 (HABIT).

Geographical Distribution: North (Acre, Amazonas, Amapá, Pará, Rondônia, Roraima, Tocantins); Northeast (Alagoas, Bahia, Maranhão, Rio Grande do Norte); Center-West (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo); South (Paraná, Rio Grande do Sul, Santa Catarina) (Flora do Brasil 2020).

11. *Dimorphandra gardneriana* Tul. Arch. Mus. Hist. Nat., 4: 185, 1844.

Common Name: Fava d'anta.

Specie description: Tree with stem trunk with 12m long, sympodial growth, woody stem, shape rope, abstipate stipules, composite leaves with 30 cm of length and 14cm long, bipinnates, opposite phyllotaxy, oblong leaflet shape, with 1.8 cm of length. and 1.0 cm wide, presents about 15 to 25 pairs of leaflets, whole leaf margin, rounded leaf apex, truncated base, diminutive petiole with approximately 0.2 cm of length, raceme inflorescence, with approximately 10 racemes, with approximately 10cm of length. and 3cm wide, shows a light greenish color with a crescent, showing stamens and tiny staminoids, absent fruit.

Material Examined: BRAZIL. Maranhão: São João do Sóter, Pedras Village, 23 / VI / 17, G. S. Gomes; G. M. Conceição, 32, 33 (HABIT).

Geographic Distribution: North (Pará, Tocantins); Northeast (Bahia, Ceará, Maranhão, Pernambuco, Piauí); Center-west (Goiás, Mato Grosso); Southeast (Minas Gerais) (Flora do Brasil, 2017).

12. *Plathymania reticulata* Benth. J. Bot. (Hooker) 4 (30): 334, 1841.

Common Name: Amarelo acende-candeia, Amarelinho, Candeia, Oiteira, Paricazinho, Pau-amarelo, Pau-de-candeia, Vinhático-branco, Vinhático-castanho, Vinhático-da-mata, Vinhático-do-campo, Vinhático-do-mato, Vinhático-rajado e Vinhático-testa-de-boi.

Specie description: Tree with woody stem, sympodial growth, height of 12m, form rope, abstact stipules, absent nectary, leaves composed of approximately 20 to 30 pairs of leaflets, bipinnates with pulvinus, alternate phyllotaxy, oblong leaflet, 2 cm long and 0.6 cm long, petiole with 3.0 cm, long leaves with 14 cm approximately, whole margin, emarginated leaf apex, penninerved vein, raceme inflorescence approximately 4 cm long. and 0.3 wide, single racemes, miniature white flowers, absent fruit.

Material Examined: Brazil. Maranhão: São João do Sóter, Permanent Protection Area; Redondo Village; Populated Stones, 08/X/16; 13/II/2016; 23/VI/2017, G. S. Gomes; G. M. Conceição, 16, 24, 68 (HABIT).

Geographic Distribution: North (Pará); Northeast (Bahia, Ceará, Maranhão, Piauí); Center-West (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo); South (Paraná) (Flora do Brasil 2020).

Phytogeographical Domains: Amazon forest, Caatinga, Cerrado, Atlantic forest (Flora do Brasil 2020).

13. *Delonix regia* (Bojer ex Hook.) Raf. Fl. Tellur. 2: 92, 1836 [1837].

Common Name: Flamboyant

Specie description: Tree with sympodial growth, woody stem, approximately 15m high, shape rope, absence stipules, composite bipinnates leaves with 30cm of length. and 15cm wide, alternate phyllotaxy, oblong leaflet shape, with 30 to 50 pairs of leaflets, with 7 mm of length. and 0,2 cm long, rounded apex, smooth margin, symmetrical base, petiole with 2,5 cm of length. and 0.4 cm wide, petiole with 0.3 cm. and 0.1 cm long, absent flower, fruit of the dehiscent type, with 15 cm of length. and 3cm wide.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23/VI/17, G. S. Gomes; G. M. Conceição, 40 (HABIT).

Geographical Distribution: North (Acre, Amazonas, Amapá, Pará, Rondônia, Roraima, Tocantins); Northeast (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe); Center-west (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo); South (Paraná, Rio Grande do Sul, Santa Catarina) (Flora do Brasil 2020).

14. *Libidibia ferrea* (Mart. Ex Tul.) LP Queiroz Legum. Caatinga 130, 2009.

Common Name: Pau-Ferro.

Specie description: Tree with woody stem, 5m high, sympodial growth, absent stipules, puberulent branches rusty, bipinnates composite leaves with approximately 10 to 15 pairs of leaflets, alternate phyllotaxy, leaflets oblong, with 3.6 cm of length., and 1.0 cm wide, petiole with 1.1 cm of length and 0.3 cm wide, leaf with approximately 6.5 cm, whole leaf margin, rounded leaf apex, penninerved vein, glabrous leaflets, indeterminate inflorescence, flower with approximately 1.0 cm of length. and 0.5 cm wide, yellow flowers, complete, dichlamydeous, heterochlamydeous, showy standard, dialysemons, legume fruit dry type, with 7.3 cm of length. and 2.0 cm wide.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23/VI/17, G. S. Gomes; G. M. Conceição, 28, 29, 30 (HABIT).

Geographic Distribution: Northeast (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro) (Flora do Brasil 2020).

15. *Caesalpinia pulcherrima* (L.) Sw. Observ. Bot. 166, 1791.

Common name: Flamboyanzinho.

Specie description: Woody trunk tree, 3 to 4m high, shows sympodial growth, presence of aculeous in the trunk with 0,4 cm of length, and 0.2 cm wide, composite leaves bipinnates with 5 pairs of pinnae, 30 cm in length, phyllotaxy alternates, without stipules, petiole with 0,5 cm of length. and 0.3 cm wide, green leaflets of 7 to 11 pairs, with 6.1 cm of length. and 3.4 cm wide, red flower with long stamens of 4 cm of length. zygomorph symmetry. legume fruit dry type with 9,3 cm of length. and 2.5 cm wide.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 13/II/17, G. S. Gomes; G. M. Conceição, 31 (Habit).

Geographical Distribution: North (Acre, Amazonas, Amapá, Pará, Rondônia, Roraima, Tocantins); Northeast (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe); Center-West (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo); South (Paraná, Rio Grande do Sul, Santa Catarina) (Flora do Brasil 2020).

16. *Inga thibaudiana* DC. Prodr. 2: 434-435, 1825.

Common name: unknown

Specie description: Shrub with 3m height, woody stem, simpodial growth, with cylindrical root, presents indumentum in the branches, form rope, compound leaves with 11,1 cm of length. and 9.5 cm wide, with 3 to 8 pairs of leaflets, alternating leaflets with 4.9 cm of comp. and 3.8 cm wide. Coriaceous in the abaxial surface, with a smooth margin, penninerved vein, petiole with tiny extraphallic nectaries, at the base of the leaflets, with a rounded nectary, fruit absent.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23/VI/17, G. S. Gomes; G. M. Conceição, 34, 35 (HABIT).

Geographical distribution: North (Acre, Amazonas, Amapá, Pará, Rondônia, Roraima); Northeast (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco); Center-West (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo) (Flora do Brasil 2020).

17. *Chamaecrista nictitans* (L.) Moench. Methodus 272, 1794.

Common name: unknown

Specie description: Herb with approximately 40cm of height, herbaceous stem, prostrate growth, branches of 28 cm of length. and 16.5 inches wide. stipules on the petiole with approximately 0.4 cm of length. and 1 cm long. composite leaves, bipinnates, oblong leaflets of approximately 0.1 cm in length, and 0.1 cm wide. rachis with 0.3 cm of length. absent flower and legume fruit with 3.5 cm of length and 0.3 cm wide.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23/VI/17, G. S. Gomes; G. M. Conceição, 58 (HABIT).

Geographical Distribution: North (Acre, Amazonas, Amapá, Pará, Rondônia, Roraima, Tocantins); Northeast (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Sergipe); Center-West (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo); South (Paraná, Rio Grande do Sul, Santa Catarina) (Flora do Brasil 2020).

18. *Chamaecrista rotundifolia* (Pers.) Greene. Pittonia 4 (20D): 31, 1899.

Common Name: Erva-de-Coração, Pasto-Rasteiro, Coração, Alfafa-Nativa, Mata-Pasto, Acácia-Rasteira, Fedegoso.

Specie description: Herb stem, triangular stipules present with 0.1 cm of length. and 0.2 cm wide. bifoliate composite leaves, alternate phyllotaxy, 3.2 cm obovate leaf, and 3 cm wide, whole leaf margin, obtuse apex, yellow zygomorphic flower, aclamydeous, legume fruit dry type with 2.2 cm in length and fruit petiole extended with 1.5 cm of length.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23/V /17, G. S. Gomes; G. M. Conceição, 66 (HABIT).

Geographic Distribution: North (Rondônia, Tocantins); Northeast (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe); Center-West (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo); South (Paraná, Rio Grande do Sul) (Flora do Brasil, 2017).

19. *Chamaecrista flexuosa* (L.) Greene Pittonia 4 (20D): 27, 1899.

Common name: Peninha

Specie description: Shrubs with woody stem, erect to decumbent growth, approximately 20cm in length, perennial, erect, with triangular stipules of 5 cm of length. and 3.2cm wide, bilobate leaves with 4cm of length. leaflets, with 5 to 10 pairs, with 4cm of length. and 1,2 cm long, extrafollicular nectary leaflets linear-lanceolate to linear oblong or closely oblong-elliptic, straight to slightly distally falcate, persistent, heteromorphic and asymmetric stipules, lanceolate acuminate or ovate acuminate, absent flower, legume fruit with 4.5 cm of length. and 0.5cm wide.

Material Examined: Brazil. Maranhão: São João do Sóter, Pedras Village, 23/VI/17, G. S. Gomes; G. M. Conceição, 48, 49, 50 (HABIT).

Geographical Distribution: North (Acre, Amazonas, Amapá, Pará, Rondônia, Roraima, Tocantins); Northeast (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe); Center-West (Distrito Federal, Goiás, Mato Grosso do Sul, Mato Grosso); Southeast (Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo); South (Paraná, Rio Grande do Sul, Santa Catarina) (Flora do Brasil 2020).

IV. Conclusion

In the research were registered 19 species, distributed in 12 genera, where the genus *Mimosa* was the most representative in number of species, with four taxa. In representative of the species *Libidibia ferrea*, *Plathymenia reticulata* and *Chamaecrista flexuosa* were the most representative. The habit of tree growth was predominant within the species and the physiognomy of gallery forest was more common for the occurrence of taxon. It was observed that the cataloged species present a relation of geographic distribution, describing an ascending trend to wide distribution in Brazil, being that *Chamaecrista flexuosa* is the species with the largest geographic distribution in Brazil. The taxonomic treatment of the species for the researched area contributed to the knowledge of the flora of the East of Maranhão and Northeast of Brazil.

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