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The Fabaceae in Northeastern Mexico II (Subfamilies Caesalpinioideae, Cercidoideae, and Detarioideae)

Eduardo Estrada-Castillón [1], José Ángel Villarreal-Quintanilla [2], Gerardo Cuéllar-Rodríguez [1], Juan Antonio Encina-Domínguez [2], Jaime Sánchez-Salas [3], Gisela Muro-Pérez [3], Diego Axayácatl González-Cuéllar [1], Oralia Magaly Galván-García [4], Luis Gerardo Rubio-Pequeño [5] and Arturo Mora-Olivo [5,*]

[1] Facultad de Ciencias Forestales, Universidad Autónoma de Nuevo León, Linares 67700, Mexico; aeduardoestradac@prodigy.net.mx (E.E.-C.); luis.cuellarr@uanl.mx (G.C.-R.); diegogonzalezcu@gmail.com (D.A.G.-C.)
[2] Departamento de Botánica, Universidad Autónoma Agraria Antonio Narro, Saltillo 25315, Mexico; javillarreal00@hotmail.com (J.Á.V.-Q.); jaencinad@gmail.com (J.A.E.-D.)
[3] Facultad de Ciencias Biológicas, Universidad Juárez del Estado de Durango, Gómez Palacio 35010, Mexico; j.sanchez@ujed.mx (J. S.-S.); giselamuro@ujed.mx (G.M-P.)
[4] ELCPAPO, Xalapa, 91120, Mexico; magalydemora@hotmail.com (O.M.G-G.)
[5] Instituto de Ecología Aplicada, Universidad Autónoma de Tamaulipas, Ciudad Victoria 87019, Mexico; luisgerardoes@live.com.mx (L.G.R.-P.); amorao@docentes.uat.edu.mx (A-M.-O.)
* Correspondence: amorao@docentes.uat.edu.mx

Abstract: As part of the Fabaceae project of northeastern Mexico, today we present the compendium of legumes of the subfamilies Caesalpinioideae, Cercidoideae and Detarioideae from this region. As in our previous work on the Mimosoideae Clade, new nomenclatural changes and retypification of genera of the subfamily Caesalpinioideae are included. Also, based on new scientific information published, the taxonomic changes in new genera, recently segregated from the genus *Caesalpinia* (*Conzattia, Coulteria, Denisophytum, Erythrostemon, Guilandina, Hoffmannseggia*, and *Pomaria*) are included. Based on field work, collection of botanical samples over the past 37 years, and reviewing botanical materials in national and international herbaria, the diversity of legumes of the subfamilies Caesalpinioideae, Cercidoideae, and Detarioideae in northeastern Mexico has been recorded. The subfamily Caesalpinioideae includes two tribes, the tribe Caesalpinieae with 12 genera (*Caesalpinia, Ceratonia, Coulteria, Delonix, Denisophytum, Erythrostemon, Gleditsia, Guilandina, Hoffmannseggia, Haematoxylum, Parkinsonia,* and *Pomaria*), and 26 species and the tribe Cassieae, which includes three genera (*Cassia, Chamaecrita*, and *Senna*) and 28 species. The subfamily Cercidoideae include two genera (*Bauhinia* and *Cercis*), and eight species and the subfamily Detarioideae, includes only one genus and one species (*Tamarindus indicus*). The total flora of these three subfamilies comprize 18 genera and 63 species, it includes 56 native species and seven exotic ones: *Bauhinia variegata, Cassia fistula, Ceratonia siliqua, Delonix regia, Erythrostemon gilliesii, Senna alata,* and, *Tamarindus indicus*. The endemism of both subfamilies includes a total of 20 species and 10 infraspecific categories.

Keywords: Leguminosae; Subfamilies Caesalpinoideae, Cercidoideae and Detarioideae; taxonomy; diversity; northeastern Mexico

1. Introduction

The family Fabaceae (Leguminosae) is the third group of plants with the greatest diversification in the world, comprising 770 genera and 19,581 species [1]. As of 2017, the Fabaceae family had radical changes in its classification, the advances in molecular biology allowed the recognition of monophyletic groups, which permitted a more natural and homogeneous grouping of taxa, increasing the number of three subfamilies (Mimosoideae, Caesalpinioideae and Papilionoideae) recognized for more than 100 years, to six subfamilies (Papilionoideae, Caesalpinioideae,

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Cercidoideae, Detarioideae, Dialioideae and Duparquetioideae). This new classification has been reinforced with analysis of DNA sequences [2,3]. The subfamily Mimosoideae is, in this instance, is now circumscribed as a clade, within the Subfamily Caesalpinioideae. The Mimosoideae clade includes almost 50 genera and 3,000 species [4]. The subfamily Cercidoideae is composed by 12 genera and 335 species [1], the subfamily Detarioideae, includes 84 genera and 760 species [1], the subfamily Dialioideae, agglultinate 17 genera and 85 species [1], while the subfamily Papilionoideae with 503 genera and almost 14,000 species [1]. Coupled with the addition of the Mimosoideae clade, the subfamily Caesalpinioideae is the one that has had the greatest number of modifications with the taxonomic studies carried out between 2016-2022 [5–7], especially at the genus level. The concept of three families (Fabaceae, Mimosaceae and Caesalpiniaceae) [8–13] of the order Fabales or of three subfamilies (Lotoideae, Mimosoideae and Caesalpinioideae) [14,15] constituents of the family Fabaceae maintained for more than 100 years has been recently replaced by the concept of Family Fabaceae, made up of six subfamilies: Duparquetioideae, Cercidoideae, Detarioideae, Dialioideae, Caesalpinioideae, and Papilionoideae [1]. Among the most significant taxonomic changes within the current Caesalpinioideae Subfamily, the following stand out: the immersion of the Mimosoideae subfamily within the Caesalpinioideae as a clade related to it [1], the subtribes Dialiinae and Duparquetiinae belonging to tribe Cassieae [16] are now recognized as two different subamilies Cercidoideae and Detarioideae respectivelly. At the beginning of the XXI'st century, four tribes are recognized as part of the Caesalpinioideae family: Cercideae, Detarieae, Cassieae, and Caesalpinieae [4], and nowadays, the recognition of the six subfamilies within the Fabacae family [1].

With the recognition of these 6 subfamilies, many of the problems concerning the systematics of Fabaceae have been resolved, especially the paraphyly of the Caesalpinioideae subfamily through the inclusion of the Mimosoideae clade within it. Classification continues with tribal and generic rank within the subfamilies as Detarioideae [6] and Caesalpinioideae [7].

With the exception of subfamily Duparquetioideae, the other five subfamilies present genera and species in Mexico. According to this new classification we can morphologically distinguish new characters that merge or separate the different groups of legumes. Among the characters that clearly separate the Duparquetioideae subfamily are the marginal glands of its petals, fusion of its anthers and type of dehiscence and its restricted distribution in western and central Africa. Two of the most obvious characters that separate the Papilionoideae subfamily from the rest of the subfamilies are its almost always bilaterally symmetrical flowers, always with the banner as the outermost petals, always enclosing the wings and the keel, in addition to the fact that the sepals are always fused, and they form a tube, at least basally. The subfamily Cercidoideae is easily distinguished by its simple, entire or bilobed, or bifoliolate leaves. The members of the subfamiy Detarioideae are recognized by their extra-floral glands (nectaries), since they are always located abaxially on the edges of the leaflets. The inflorescence of members of subfamily Dialioideae have distichous anthotaxy and moslty imparipinnate leaves (rarely paripinnate in *Poeppigia* (in Mexico)), while the members of Subfamily Caesalpinioideae have inflorescences with spiral anthotaxy, commonly paripinnate leaves, and commonly seeds with open or closed pleurogram on each of the two sides.

Legumes (Fabaceae) are one of the groups most cited as useful species in different cultures of the world, and Mexico is no exception, since the enormous diversity of species [17–31] and varied ecosystems existing in this country [32]. In a compendium of the main legumes in southern Mexico, the most outstanding uses were nutritional, environmental, materials, fuel, medicinal and forage [33]. In the north of Mexico, multiple uses of different genera of legumes have been reported, among which the most prominent uses are: timber (*Neltuma, Ebenopsis, Havardia, Senegalia,* and *Vachellia*), food (*Phaseolus, Lens, Tamarindus,* and *Cicer*), medicinal (*Eysenhardtia* and *Indigofera*), forage (*Medicago, Vachellia, Neltuma* and *Leucaena*), artisanal (*Ebenopsis*), green manure (*Leucaena*), fuel (*Neltuma, Vachellia, Senegalia, Havardia* and *Ebenopsis*), and charcoal (*Neltuma* and *Vachellia*) [34–37]. For southern Mexico, several species such as *Enteroloboium cyclocarpum, Neltuma juliflora, Lonchocarpus castilloi* and *Dalbergia granadillo* are reported as timber species for making furniture, bars for train tracks, wooden floors and making guitars [38]. *Olneya tesota* is considered of a high ecological value species [39], medicinal, food, artisanal, and source for hand tools [40,41]. *Parkinsonia praecox* is widely used as food

 doi:10.20944/preprints202404.0408.v1

and medicinal [42], this species is used in southern Mexico as forage, fuel and medicinal also [43]. The fruits, seeds and leaves of species belonging to *Canavalia, Crotalaria, Glycine,* and *Lupinus* are used as source of protein, fatty acids, and healthy components [44–47]. *Lablab,* and species of *Lathyrus* and *Medicago* are widely used as source of forage, green manure, industrial, medicinal, ornamental, nitrogen fixer, and food, [48–50]. The genus *Phaseolus* has represented one of the most important food legumes for human consumption on the planet [51]. Other genera has polyfunctional species such as *Erythrina,* providing high quality protein and alcaloids [46]. The Detarioideae include many ecologically important tree species such as *Hymenaea* and *Peltogyne* are used as timber plants, and *Tamarindus* is frequently used as condiment [7] and to make flavored and sweet drinks [36].

The Mexican Leguminosae flora currently consists of 1,893 species, where at least 40% of them, are endemic [33]. In northeastern Mexico, 56 genera and 134 species of legumes has been reported for the state of Coahuila [18], while 67 and 234 respectively of this family are reported for Nuevo León [17]. For Tamaulipas, 22 genera and 55 legume species of honey importance are reported [52]. Isolated studies concerning the subfamily Caesaplinoideae cite part of the diversity of genera and species of Fabaceae in the northeastern Mexico, as is the case of *Senna, Chamaecrista* and *Cassia* [16,53], the *Caesalpinia* group, *Caesalpinia, Erythrostemon* [54], *Bauhinia* [53,55], *Cercis* [53,56], *Delonix* [53], *Gleditsia* [57], *Haematoxylum* [53], *Hoffmannseggia* [53,58], *Parkinsonia* [53], *Pomaria* [59], *Tamarindus* [53], *Conzattia, Coulteria, Denisophytum,* and *Guilandina* [5].

Based on the nomencaltural changes of the new classification of legumes [1]and given the lack of a complete study of the species richness of these three subfamilies, the aims of this study are: to provide a study of the diversity of the Fabaceae Family (Subfamilies Caesalpinioideae, Cercidoideae and Detarioideae) in northeastern Mexico, providing information concerning their new nomencalture, ecology, uses, and distribution of all taxa in northeastern Mexico.

2. Results

2.1. Diversity

The flora of northeastern Mexico is represented by four (Caesalpinioideae, Cercidoideae, Detarioideae and Papilionoideae) of the six subfamilies currently recognized in the most recent taxonomic classification of the family Fabaceae [1], only the first three subfamilies are included in this study. The subfamily Caesalpinioideae (excluding the Mimosoideae clade), is composed of two tribes, the tribe Cassieae includes three genera (*Cassia, Chamaecrista*, and *Senna*) and 28 species, and the tribe Caesalpinieae which includes 12 genera (*Caesalpinia, Ceratonia, Coulteria, Delonix, Denisophytum, Erythrostemon, Gleditsia, Guilandina, Hoffmannseggia, Haematoxylum, Parkinsonia,* and *Pomaria*) (Figures 1–3), 26 species, and four subspecies. The subfamily Cercidoideae include two genera (*Bauhinia* and *Cercis*) (Figure 3) , eight species, and three subspecies, and the subfamily Detarioideae, includes only one genus and one species (*Tamarindus indicus*) (Figure 3). The total flora of these three subfamilies comprize 19 genera and 64 species, it includes 57 native species and seven exotic ones (*Bauhinia variegata, Cassia fistula, Ceratonia siliqua, Delonix regia, Erythrostemon gilliesii, Senna alata,* and, *Tamarindus indicus*), five of which belong to the subfamily Caesalpinioideae, one to Cercidoideae and one to Detarioideae. With the exception of *Bauhinia* (seven species) (Cercidieae) almost all genera with the highest number of species belong to the tribe Caesalpinieae: *Senna* (21), *Pomaria* (6), *Chamaecrista* (6), *Erythrostemon* (5), and *Hoffmannseggia* (5). Including the infraspecific taxa, the most common growth forms of the species are herbaceous (31 taxa), shrubs (25 taxa), and trees (15 taxa).

 doi:10.20944/preprints202404.0408.v1

Figure 1. Species representative of the genera of tribe Caesalpinioideae in northeastern Mexico. Tribe Cassieae: *Cassia fistula* (a), *Chamaecrista greggii* ssp. *greggii* (b), *Senna wislizeni* ssp. *wislizeni* (c). Tribe Caesalpinieae: *Caesalpinia pulcherrima* (d), *Ceratonia siliqua* leaves (e), *Ceratonia siliqua* fruits (f), and *Coulteria pringlei* (g).

 doi:10.20944/preprints202404.0408.v1

Figure 2. Species representative of the genera of tribe Caesalpinioideae in northeastern Mexico. *Delonix regia* (a), *Denisophytum sessilifolium* (b), *Erythrostemon mexicanus* flowers (c) and fruits (d), *Gleditsia triacanthos* (e), *Guilandina bonduc* leaves (f), and fruit and seeds (g), and *Hoffmannseggia glauca* (h).

 doi:10.20944/preprints202404.0408.v1

Figure 3. Species representative of the genera of tribe Caesalpinioideae in northeastern Mexico: *Haematoxylum brasiletto* (a), *Parkinsonia texana* ssp. *macra* (b), *Parkinsonia aculeata* (c), *Pomaria wootonii* (d). Species representative of the genera of tribe Cercidoideae: *Bauhinia macranthera* (e), *Cercis canadensis* flowers (f), *Cercis candensis* leaves and fruits (g). Species representative of the genera of tribe Detarioideae: *Tamarindus indicus* (h).

The Table 1 shows the diversity of genera and species of the four subfamilies in northeastern Mexico and other regions of this country, and the south of the United States (see File S1, Supplementary Material also). Based on these data, the greatest diversity of genera and species of the four subfamilies is concentrated in Chiapas, the Novo Galicia region, and the northeastern Mexico. The least diversity is recorded in the Valley of Mexico and the state of California. It is also clear that the Caesalpinioideae is the subfamily with the largest number of genera and species of all the subfamilies of Fabaceae, but also, that the greatest diversity of genera and species of this subfamily occurs in Novo Galicia region, the NE Mexico, and the state of Chiapas. However, the northeastern Mexico is the region with the greatest diversity of genera of Caesalpinioideae, followed by the state of Chiapas and the Novo Galicia region. Among the regions compared, the state of Cafornia and the Valley of Mexico region are the ones with the least generic and species diversity.

 doi:10.20944/preprints202404.0408.v1

Table 1. Diversity of the subfamilies Caesalpinioideae, Cercidoideae, Detarioideae, and Dialioideae in different areas of Mexico, and southern south USA (California and Texas), based in Megamexico 1. Gen = Genera, Spp = species, Tot = Total.

	Caesalpinioideae		Cercidoideae		Detarioideae		Dialioideae			
	Gen.	Spp.	Gen.	Spp.	Gen.	Spp.	Gen.	Spp.	Total Gen.	Total Spp.
NE Mexico (this study)	15	54	2	8	1	1	0	0	18	63
El Bajio region	8	30	2	6	0	0	0	0	10	36
State of Durango	13	30	0	0	0	0	0	0	13	30
State of Texas	8	36	0	0	0	0	0	0	8	36
State of Tabasco	10	39	1	6	1	1	1	1	13	47
State of Chiapas	15	55	1	12	3	4	2	2	21	73
Novo Galicia region	14	60	1	8	3	3	1	1	19	72
State of Quintana Roo	12	24	1	5	0	0	0	0	13	29
State of Yucatán	7	27	1	5	1	1	1	1	10	34
Chamela region	16	19	1	4	0	0	1	1	18	24
Sonoran Desert region	8	33	1	1	1	1	0	0	10	35
State of California	2	5	0	0	0	0	0	0	2	5
Valley of Mexico region	2	3	0	0	0	0	0	0	2	3
Zimatán, Oaxaca	9	28	1	4	1	1	1	1	12	34

2.2. Number of Genera and Species of the Subfamilies Caesalpinioideae, Cercidoideae and Detarioideae and NE Mexico, and Compared to Other Areas of Mexico (Including Subfamily Dialioideae), and the Southern United States

The subfamily Caesalpinioideae constitute a wide group of taxa being abundant across the main tropical biomes such as savannas, tropical forest, rain forest, and spreading to arid areas, warm and even cool areas, and most of species distributing below 2500 m elevation [7]. This same pattern of distribution and ecological behavior is repeated in the northeast of Mexico, since the diversity of species of Caesalpinoideae is distributed in practically almost all the ecosystems of this region, mainly in tropical and subtropical areas, through semi-arid scrublands and jungles. Decreasing in its diversity as humidity decreases and altitude increases into desert scrublands of the high desert and semi-desert plains.

The subfamily Cercidoideae in northeastern Mexico represents 16% and 2.3% of the total genera and species respectively for the planet. This subfamily is represented in all compared areas for a maximum of two genera, *Bauhinia* and *Cercis*, both of them occur only in the Bajio region and NE Mexico. Within this subfamily, *Bauhinia* is by far the genus with the largest number of species, and it is mostly diversified in Chiapas, NE Mexico and Novo Galicia region (see File S1, Supplementary Material). The Detarioideae is the subfamily of Fabaceae with the least diversity in northeastern Mexico, since of its 84 genera and 760 total species [1], only *Tamarindus indicus* is recorded for this area. This subamily has the largest number of genera (*Cynometra, Hymenaea*, and *Tamarindus*) and species in the state of Chiapas and the Nuevo Galicia region (see File S1, Supplementary Material). The subfamily Dialioideae is only representred by two genera in Mexico, *Dialium* and *Poeppigia*, both

 doi:10.20944/preprints202404.0408.v1

present in Chiapas, and in central-south of Mexico, and absent of the rest of the compared areas, including northeastern Mexico (see File S1, Supplementary Material).

2.3. Endemism

Two of the three subfamilies recorded have species endemic to northeastern Mexico. At least six genera of tribe Caesalpinieae, two of the tribe Cassieae, both belonging to subfamily Caealpinioideae, and only one genus of Cercideae, include species endemic to Mexico. These nine genera represent almost 60% of the total genera. The genera of the tribe Caesalpinieae in nortehastern region with endemic species in Mexico are, *Coulteria, Denisophyton, Erythrostemon, Hoffmannseggia, Parkinsonia,* and *Pomaria*. The genera of the tribe Cassieae with endemic species in Mexico are *Chamaecrista* and *Senna*. *Bauhinia* is the only genus of the tribe Cercideae with endemic species in Mexico. The endemism of both subfamilies includes a total of 20 species and 10 infraspecific categories.The Table 2 shows the total number of genera with endemic species for Mexico and southern Texas (USA) based in Megamexico 1.

Table 1. Endemism of the tribes Caesalpinieae and Cercideae on northeastern Mexico and southern Texas (USA), based in Megamexico 1.

	Tribe Caesalpinieae	Tribe Cercidieae
Endemic to Mexico	*Coulteria pringlei*	*Bauhinia coulteri*
	Denisophytum sessilifolium	*Bauhinia ramosissima* ssp. *ramosissima*
	Hoffmannseggia watsonii	*B. ramosisisma* ssp. *uniflora*
	Chamaecrista chamaecristoides ssp. *chamaecristoides*	
	Senna crotalarioides	
	S. wislizenii ssp. *painteri*	
Endemic to the north of Mexico	*Pomaria canescens*	
	P. fruticosa	
	Senna wislizenii ssp. *villosa*	
Endemic to NE Mexico	*Erythrostemon caudatus*	
	E. phyllanthoides	
	Hoffmannseggia drummondii	
	H. oxycarpa	
	Pomaria wootonii	
	Chamecrista greggii ssp. *potosina*	
	Senna demissa ssp. *demissa*	
	S. demissa ssp. *radicans*	
Endemic to one state in Mexico	*Senna guatemalensis*	*Bauhinia bartlettii*
	S. monozyx	
Endemic to NE Mexico and Southern Texas (USA)	*Erythrostemon caudatus*	*Bauhinia lunaroides*
	E. phyllantoides	
	Hoffmannseggia drummondii	
	H. oxycarpa ssp. *oxycarpa*	
	Parkinsonia texana	
	Pomaria austrotexana	

 doi:10.20944/preprints202404.0408.v1

Chameacrista greggii ssp. *greggii*	
Senna durangensis	
S. pilosior	

Of the total taxa, 29 belong to Caesalpinieae and five to Cercideae. The genera with the highest number of endemic species and infraspecific categories respectively are *Senna* (8 and 4), *Bauhinia* (4 and 2), *Hoffmannseggia* (4), *Pomaria* (4), *Erythrostemon* (4), and *Chamaecrista* (2).

According to [1] the floral symmetry, the position of the banner with respect to the remaining petals in the flower, number of fertile stamens, and type of leaf (simple, bifoliolate, pinnate or bipinnate) it is possible to recognize the subfamilies of the family Fabaceae present in northeastern Mexico, the following dichotomous key allows us to differentiate them from each other.

2.4. Taxonomic Treatment

Subamilies of Fabaceae occurring in Northeastern Mexico

1A.	Flowers zygomorphic, rarely actinomorphic; the banner petal the outermost, enclosing the wings and the keel, or the lateral petals lacking; calyx gamosepalous, at least basally	Subfamily **Papilionoideae** (not included in this manuscript)
1B	Flowers actinomorphic, not zygomorphic, if so, the banner, the innermost or the petals valvate; calyx gamosepalous or synsepalous	2
2A.	Leaves bipinnate	Subfamily **Caesalpinioideae**
2B.	Leaves not bipinnate	3
3A.	Leaves simples, unifoliolate, entire or bilobed, or compound and bifoliolate (if so, then shrubs)	Subfamily **Cercidoideae**
3B.	Leaves bifoliolate (if so, then herbaceous) or pinnate	4
4A.	Fertile stamens 3, its filaments united; trees cultivated	Subfamily **Detarioideae**
4B.	Fertile stamens 7-10, its filaments free	Subfamily **Caesalpinioideae**

Subfamily Caesalpinioideae (DC.) K. R. Robertson & Y. T. Lee, J. Arnold Arbor 57(1):1. 1976.

Trees, shrubs, subshrubs or herbaceous, unarmed or armed with prickles or spines. Stipules absent or present. Leaves bifoliolate, pinnate or bipinnate. Inflorescences commonly in racemes or panicles, rarley solitary. Flowers hermaphroditic, less commonly unisexual, zygomorphic. Sepals 3-6, free or united. Petals present and free, rarely absent, aestivation imbricate, sometimes valvate, with the adaxial petal the innermost. Stamens 10 or less. Staminodes sometimes present. Filaments free, anthers longitudinally dehiscent or through terminal pores. Ovary 1 many-ovulate. Fruit a pod, 1 to many seeds, chartaceous or thick and woody, dehiscent inhertly o explosively or indehiscent.

The subfamily Caesalpinioideae (excluding the clade Mimosoideae) groups 62 genera and almost 1,200 species [1], distributed in tropical, subtropical and xeric regions of the world, and some species reaching temperate areas.

This is the subfamaily with the largest number of taxonomic changes, especially the *Caesalpinia* group and specifically the genus *Caesalpinia*, increasing from 21 recognized genera [4] to 26 genera [5].

Tribe Caesalpinieae Rchb., Fl. germ. excurs. 2(2): 544. 1832. Tribe Ceratonieae Rchb., 2(2): 544. 1832. , Fl. germ. excurs. 2(2): 544. 1832. Tribe Dimorphandreae Benth., in Hook., J. Bot. 2: 74. 1840.

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Tribe Sclerolobieae Benth., Gen. pl. 1: 436. 1865. Tribe Moreae Britton & Rose, N. Amer. fl. 23(4): 201. 1930 (Lewis, 2005).

Herbaceous, shrubs or trees, unarmed or armed with prickles or thorns simple or branched. Leaves pinnate or bipinnate, ending in a single pinnae or in a pair of pinnae. Pinnae 1-several pairs per leaf. Flowers with or without petals, the petals yellow, orange, red, scarlet-red, white, pink or green, hermaphrodite or unisexual. Calyx narrow to conspicuosly imbricate, the sepals persistent or caducous, the margins base entire, pubescent or glandular-pectinate. Androecium basally cupped on the lower cuculate sepal or not cupped. Stamens 5-10. Staminodes present or absent. Fruit flattened, membranous, papery chartaceous to woody, indehiscent or dehiscent, the valves curling up when opening, glabrate, simple pubescent and/or with glandular, plumose, dendritic or palmate trichomes, and sessile black to orange glands, unarmed or provided with spines.

The tribe Caesalpinieae contains at least 448 species (Lewis et al., 2005), and its number of genera has been gradually increasing as new and innovative studies have been carried out, from 12 to 21 (Lewis et al., 2015), and from 21 to 26 (Gagnon et al., 2022).

Here we includes the new taxonomic changes that have been made to the generic rank in the *Caesalpinia* group [5], where several genera such as *Pomaria* [59], *Hoffmannseggia* [58], *Erythrostemon* [4], *Coulteria* [60], *Guilandina* [5], *Denisophytum* [5], and *Conzattia* and now considered monophyletic, and also morphollogically separated and recognized as different generic entities.

The genus *Ceratonia* previously included in Cassiaeae, is now part of Caesalpinieae [4,61]. In northeastern Mexico, *Haematoxylum* has only been recorded with pinnate leaves.

Although the presence of *Conzattia arborea* has been reported for the state of Tamaulipas, no records of this species were found by the authors, nor in SEINet databases, nor in any national or foreign herbaria mentioned above, so this species is not included in this study.

1A	Petals absent; flowers unisexual; fertile stamen 5	***Ceratonia***
1B	Petals present; flowers hermaphrodite; fertile stamens 7-10.	2
2A.	Leaves pinnate	***Haematoxylum***
2B	Leaves bipinnate	3
3A.	Shrubs or trees armed with straight prickles, three branched, two lateral ones and one central terminal	***Gleditsia***
3B.	Herbaceous, shrubs or trees, unarmed or armed with prickles or thorns simple, never branched	4
4A.	Tree, unarmed; petals 3-5 cm long, scarlet-red; Fruit 30-50 cm long; cultivated species	***Delonix***
4B.	Trees, shrubs or herbaceous, petals 3 cm long or shorter, if petals longer, then fruits only 18 cm long or shorter; wild species	4
5A.	Leaves ending in a pinna	6
5B.	Leaves ending in a pair of pinnae	8
6A.	Sepals persistent in the fruits; herbaceous	***Hoffmannseggia***
6B.	Sepals caducous in the fruit; subshrubs, shrubs or trees	7
7A.	Androecium and gynoecium basally cupped on the lower cuculate sepal, lower lateral sepals forming a plataform at right angles to the abaxial cuculate sepal; pods with simple trichomes, glandular-punctate trichomes, and plumose, dendritic, and/or stellate trichomes; adaxial surface of leaflets with sessile black or orange glandular spots	***Pomaria***
7B.	Androecium and gynoecium not cupped basally, flexed at lower cuculate sepal, lateral sepals not forming a platform; pods	

 doi:10.20944/preprints202404.0408.v1

	glabrous or with simple and/or glandular-dotted trichomes, the latter sometimes also dendritic or feathery; adaxial surface of leaflets without sessile black or orange glandular spots	***Erythrostemon***
8A.	Leaves with two pairs of pinnae or less	***Parkinsonia***
8B.	Leaves with three or more pairs of pinnae	9
9A.	Unarmed plants; fruit slender, flattened, elliptical to oblong-elliptical, membranous or papery, indehiscent; margin of the base of the sepals glandular-pectinate; unisexual flowers; leaflets without glands	***Coulteria***
9B.	Plants armed with thorns; fruit oblong-elliptic, elastically dehiscent, broadly elliptic, its valves curling up when opening, unarmed or armed with spines; base margins of sepals entire; hermaphrodite flowers; leaflets without glands or with red glands	10
10A.	Creeping shrubs; fruit broadly elliptical or circular, armed with spines	***Guilandina***
10B.	Shrubs or erect trees; fruit elliptical-oblong, without prickles	11
11A.	Flowers yellow; pinnae 1 pair per leaf; leaflets 2-3 pairs per pinnae	***Denisophytum***
11B.	Flowers orange, red, or yellow; pinnae 8-18 pairs per leaf; leaflets 7-24 pairs per pinnae	***Caesalpinia***

Caesalpinia L. Sp. Pl. 1: 380 1753, descr. emended E. Gagnon & G. P. Lewis

Type: *Caesalpinia brasiliensis* L. Sp. Pl. 1: 380. 1753.

Shrubs or trees, armed with curved prickles scattered on stems, leaves, leaf rachis, and leaflets or in pairs (base of leaves). Leaves alternate, bipinnate, paripinnate. Pinnae most frequently 2-6 pairs per leaf, rarely 1 pair. Leaflets 3-13 pairs per pinnae, opposite or alternate. Inflorescences terminal or axillar, arranged in racemes or panicles. Flowers zygomorphic, bisexual, yellow to orange or red (in NE Mexico). Calyx 5-merous, caducous, the sepals free, the lower one cucullate (in the form of a cap). Petals 5, free, longer than sepals. Stamens 10, free, the filaments pubescent. Fruit 3-12 × 0.7-2.6 cm, linear, oblong to elliptic, coriaceous, compressed, glabrous, explosively dehiscent, the valves twisted after dehiscence. Seeds obovoid, laterally compressed.

Of the approximately 20 species of *Caeslapinia* recorded for northeastern Mexico, today 19 of them are included within other genera such as *Conzattia, Coulteria*, *Denisophytum*, *Erythrostemon*, *Guilandina*, *Hoffmannseggia,* and *Pomaria.*

Currently, nine species of *Caesalpinia* are recognized [5], distributed in neotropical region, inhabiting in tropical, subtropical woods, and coastal areas. Only one species is recorded from northeastern Mexico.

Caesalpinia pulcherrima (L.) Sw., Observ. Bot. (Swartz) 166. 1791. Basionym: *Poinciana pulcherrima* L., Sp. Pl. p. 380. 1753.

Type: Mexico, *non date, J.A. Pavón s.n.* (BM952034!).

Distinguishing features: Shrub or tree, 3-7 m tall, armed with straight and sharp prickles, rarely unarmed. Leaves bipinnate. Pinnae 8-18 pairs per leaf. Leaflets 7-24 pairs per pinnae. Inflorescences axillary or terminal, arranged in long racemes or panicles. Flowers red or yellow. Sepals oblong or oblanceolate, much shorter than the petals. The banner generally longer, with tubular and revolute claw. Stamens 10, free, protruding of petals, filaments red. Fruit 6-16 × 1.3-2.0 cm, linear-oblong, with straight upper margin, slightly curved lower margin, dark-brown or black when mature.

 doi:10.20944/preprints202404.0408.v1

Representative examined material: Coahuila: 12-IX-1991, *M.A. Carranza s.n*. (ANSM). Nuevo León: 23-VII-2002, *E. Estrada 15007* (CFNL); 15-XI-2009, *E. Estrada s.n.* (CFNL). Tamaulipas: 8-VII-1986, *C.G. Romo 59* (UAT); 29-IX-1996, *C. Ramos 135* (UAT); 22-IX-1999, *A. Mora-Olivo 7595* (UAT); 17-VIII-1985, *M. Martínez 804* (UAT).

Comments: Apparently native from northwestern Mexico (Sonora) (Gagnon et al., 2016). Due to the colorful and showy nature of its red or yellow flowers and its elegant foliage, this species is used as ornamental in patios and private and public gardens. In northeastern Mexico is popularly known as *tabachin*.

Ceratonia L., Sp. Pl. 2: 1026. 1753.

Type: *Ceratonia siliqua* L., Sp. Pl. 2: 1026. 1753.

Shrubs or trees, dioecious, evergreen. Leaves pinnate, paripinnate. Leaflets 3-6 pairs per leaf, opposite or subopposite, leathery, elliptical-oval to suborbicular, emarginate or obtuse, adaxially shiny, abaxially opaque. Inflorescences regularly borne on old branches, arranged in fasciculated racemes. Perianth poorly developed, cup-shaped, with 5-7 tepals. Stamens 2-8, free, the ones of female flower without pollen, the ones of male flowers well developed, with long filamentes and long anthers. Receptacle disc well developed. Flowers unisexual. Fruit linear, compressed, thick, indehiscent, leathery, black-reddish, pericarp fleshy-fibrous, sweet, internally pulpy. Seeds arranged transversely.

Genus represented by 2 species, one *C. oreothauma* [62], restricted in the south of the Arabian Peninsula (Oman and Yemen), and Somalia (eastern Africa), and the other, *C. siliqua*, species widely distributed worldwide, this one is recorded in the northeastern Mexico.

Ceratonia siliqua L., Sp. Pl. 2: 1026. 1753.

Type: Country unknown, date unknown, *Anon. s.n.* (Lectotype: LINN-HL1239-1!)

Distinguishing features: Tree or shrub, 5-8 m high, Leaflets 2-6 × 1.8-5 cm, leathery, elliptic to suborbicular. Inflorescences arranged in fasciculated racemes. Corolla absent, male flowers with 5 free stamens and a rudimentary ovary, female flowers with 5 small staminodes. Fruit 8-14 × 1.0-1.5 cm, linear, compressed, thick, indehiscent, leathery, reddish-black, straight or slightly curved, internally pulpy.

Representative examined material: Nuevo León: 15-IV-02, *E. Estrada 14532* (CFNL); 16-V-1982, *G. Alanís s.n.* (CFNL). Tamaulipas: 27-III-2024, *A. Mora-Olivo s.n.* (UAT).

Comments: Native to the Mediterranean region. In northeastern Mexico it is used as ornamental in public and private gardens, it is called *algarrobo*.

Coulteria Kunth, Nov. Gen. Sp. 6 ed. fol. 258. 1824, 6 ed. qu. 328. 1824., exclud. t. 568 & 569 which = *Tara spinosa* (Molina) Britton & Rose; descr. emend. E. Gagnon, Sotuyo & G.P. Lewis, Phytokeys 71: 51-53. 2016. *Brasilettia* sensu Britton & Rose in N. Amer. Fl. 23(5): 320. 1930, non *Brasilettia* (DC.) Kuntze, Rev. Gen. 1: 164. 1891, nec *Caesalpinia* Sect. *Brasilettia* DC., Prodr. 2: 481. 1825. *Guaymasia* Britton & Rose in N. Amer. Fl. 23(5): 322. 1930.

Type: *Coulteria mollis* Kunth, Nov. Gen. Sp. 6: 330. 1824.

Trees or shrubs, unarmed, dioecious, young parts bronze velvety pubescent. Leaves bipinnate. Pinnae 2-6 pairs per leaf. Leaflets 2-14 pairs per pinnae. Inflorescences axillar or terminal, arranged in racemes Flowers zygomorphic, unisexual. Calyx gamosepalous, 5-merous, velvety pubescent, 5-lobed, the lower sepal cucullate, glandular pectinate. Corolla with 5 petals. Staminate flowers with pubescent filaments, similar or longer than petals and a rudimentary sterile ovary. Female flowers with ovary and style well developed, longer than stamen filaments, anthers lacking pollen. Fruit pendulous, flattened, oblong to elliptic, rarely suborbicular, chartaceous, papery or membranaceous, indehiscent or tardily so along one suture, spongy-septate or not internally, sometimes persisting to the next season. Seeds transversally arranged.

Genus of 7 species [5,65], inhabiting subtropical deciduous woods, seasonal tropical forest, and scrublands in semiarid areas in Mexico, Central America to north of South America. Genus easily distinguishable from its relatives of the former *Caesalpinia* group (*Caesalpinia, Conzattia, Denisophytum,* and *Guilandina*) by its unarmed stems and branches, and its unisexual flowers.

 doi:10.20944/preprints202404.0408.v1

Coulteria pringlei (Britton & Rose) J.L. Contreras, S. Sotuyo & G.P. Lewis. Phytotaxa 291(1): 39. 2016. Basionym: *Brasilettia pringlei* Britton & Rose, in N. Amer. Fl. 23(5): 322 1930. *Caesalpinia pringlei* (Britton & Rose) Standl., in Trop. Woods 34: 40. 1933.

Type: Mexico, San Luis Potosi, Las Palmas, 8-VII-1896, *C. G. Pringle 6356* (Isotype: P2142666!, M111307!).

Distinguishing features: Shrub or tree up to 7 m tall. Pinnae 1-3 pairs per leaf. Leaflets 6-12 pairs per pinnae, commonly alternate along the rachis, abaxially yellowish, prominently veined. Inflorescence axillar, arranged in racemes. Pedicels joined. Calyx yellowish, lower sepal cucullate, larger than the others, marginally eroso-glandulous. Flowers unisexual. Corolla yellow, banner with tick texture, flabelled, strongly recurved. Stamens basally widened and pubescent. Fruit 5-8 cm × 2-3 cm, compressed, oblong to elliptical, indehiscent, the sutures thickened, light-brown when mature.

Representative examined material: Tamaulipas: 25-I-1985, *L. Hernández 1389* (UAT, MEXU); 15-VIII-1930, *H.H. Bartlett 10964* (NY3196585!).

Comments: Endemic to Mexico. Easy to identify by its long, abaxially strongly veined leaflets, unisexual yellow flowers, and the cucullate lower sepal. Recorded only in the state of Tamaulipas, in piedmont scrub, 300 (Sierra de San Carlos) - 800 (Municipality of Abasolo) m altitude, out of the area also in San Luis Potosi, Guanajuato, Querétaro, Guerrero, Sinaloa, Oaxaca, and Hidalgo.

Delonix Raf., Fl. Tellur. 2: 92. 1836. *Aprevalia* Baill., Bull. Mens. Soc. Linn. 428. 1884.

Type: *Delonix regia* (Boj. ex Hook.) Raf. Fl. Tellur. 2: 92. 1837. *Delonix regia* var. *flavida* Stehlé, Bull. Mus. Natl. Hist. Nat., sér. 2, 18: 186. 1946. *Poinciana regia* Boj. ex Hook.) Bot. Mag. 56: pl. 2884. 1829.

Small trees, unarmed, evergreen or deciduous for a short time. Pinnae 10-25 pairs per leaf. Leaflets 10-40 pairs per pinna. Inflorescences arranged in terminal racemes. Flowers large and showy, scarlet or red-orange. Calyx gamosepalous, 5-lobed, green with yellow and red tones, equal or half the length of the petals. Corolla with 5 petals, long unguiculate, reflexed with age, equal. Stamens 10, free, exert, filaments of different sizes, curved and hairy. Fruit pendulous, broadly linear, sometimes greater than 50 cm, flattened, long, woody, septate between the seeds, persistent, tardly dehiscent or indehiscent. Seeds elliptical.

Genus represented by 11 species, nine endemic to Madagascar, also in Africa, Arabia, and India [4]. One species (*Delonix regia*) widely distributed worldwide.

Delonix regia (Bojer ex Hook.) Raf. Raf., Fl. Tellur. 2: 92. 1837. Basionym: *Poinciana regia* Bojer ex Hook. in Bot. Mag. 56, Table 2884. 1829.

Type: Martinique (Martinique), 14-VII-1939, *M. Stehlé, H. Stehlé 4534* (Holotype: US00376297).

Distinguishing features: Tree 4-8 m tall, sometimes wider than long. Leaves bipinnate, Pinnae 11-35 pairs per leaf. Leaflets 28-40 pairs per pinnae. Inflorescences axillar, in the distal parts of the branches, arranged in short racemes. Calyx 5-merous, sepals much shorter than petals. Corolla of 5 scarlet red, free, long unguiculate petals. The banner with yellow tones and different shape and color of the other petals. Fruit pendulous, 20-50 cm long, linear, laterally compressed, indehiscent, woody, persistent, multi seeded.

Representative examined material: Nuevo León: 21-VII-87, *E. Estrada 661* (CFNL). Tamaulipas: 2-V-1985, *C.G. Romo 457* (UAT).

Comments: In northeastern *Delonix regia*, is known as *framboyán* or *flamboyán*, it is widely used as ornamental species in public and private gardens; its fruits are called "sonajas" (rattles), and used as musical instrument.

Denisophytum R. Vig., Notul. Syst. (Paris) 13(4): 349. 1948, descr. emended E. Gagnon & G. P. Lewis, PhytoKeys 71: 43-46. 2016.

Type. *Denisophytum madagascariense* R. Vig. Notul. Syst. 13: 349. 1949.

Shrubs or trees up to 5 m tall, armed with scattered curved or straight prickles, sometimes a pair of prickles below the petiole. Leaves bipinnate. Stipels spinose arising in the insertion of pinnae on the leaf rachis, and also, occasionally arising at the base of leaflets. Pinnae 1-6 pairs per leaf. Leaflets 2-11 pairs per pinnae. Inflorescences axillar or terminal, arranged in racemes. Flowers yellow, hermaphrodite, zygomorphic. Calyx dialysepal, 5-lobed, the lower one marginally entire, cucullate. Corolla of 5 petals, free, the banner (central petal) with red tones in the center adaxially. Stamens 10,

 doi:10.20944/preprints202404.0408.v1

free, hairy. Fruit 1.5-5 × 0.5-1.5 cm, flattened, coriaceous, explosively dehiscent, valves twisted after dehiscence. Seeds compressed, ovoid.

Genus of 8 species of North and South America, Madagascar and Africa [5]. A genus almost similar in morphology to *Caesalpinia*, the only one striking difference between them is the color of flowers, more variable in *Caesalpinia* (orange, red, green, white).

Denisophytum sessilifolium (S. Watson) E. Gagnon & G.P. Lewis, PhytoKeys 1(1): 47. 2016. Basionym: *Caesalpinia sessilifolia* S. Watson, Proc. Amer. Acad. Arts and Sci. 21: 450. 1886. *Poinciana sessilifolia* (S. Watson) Rose, in Contrib. U. S. Nat. Herb. 13(9): 303. *1911.*

Type: Mexico, Coahuila de Zaragoza, Hills and Mesas, Jimulco, 16-V-1885, *C.G. Pringle 202* (Isotype: MO-125071!, F0057403F!, P02940718!; Syntype: E00178608!, GH00059873!, UVMVT026012).

Distinguishing features: Shrub, 1-1.8 m tall, glabrous, armed with a pair of straight or curved prickles at the insertion of the petiole or immediately below. Pinnae 1 (almost sessile) pair per leaf, accompanied by a pair of prickles at the base. Petiolules with spiny stipels. Leaflets 2-3 pairs per pinnae. Inflorescences axillar or terminal, arranged in racemes, the pedicels subtended by a pair of prickles. Corolla yellow. Stamens 10, free, filaments hairy, same size as petals or little longer. Calyx dialyspeal, 5 sepals, as long as petals. Fruit 2-3 × 1-1.5 cm, compressed, oblong to rhomboid-trapezoid, coriaceous, dehiscent, reddish-brown. Seeds 1-3.

Representative examined material: Coahuila: 18-VII-2007, *J. A. Alba 110* (CFNL); 18-VII-2007, *J. A. Alba 148* (CFNL); 25-VIII-1988, *J.A. Villarreal 4386* (ANSM).

Comments: Endemic to north of Mexico, recorded only in the state of Coahuila in arid shrublands. Outside the study area, recorded in Durango and Chihuahua.

Erythrostemon Klotzsch, in Link, Klotzsch & Otto, Icon. Pl. Rar. Horti. Berol. 2: 97, t. 39. 1844, descr. emended E. Gagnon & G. P. Lewis, Phytokeys 71: 115. 2016. *Poincianella* Britton & Rose (1930), pro parte, including the type species *Caesalpinia mexicana* A. Gray, Proc. Amer. Acad. Arts 5: 157. 1861. *Poincianella mexicana* (A. Gray) Britton & Rose, N. Amer. Fl. 23(5): 330. 1930.

Type: *Erythrostemon gilliesii* (Hook.) Klotzsch, Icon. Pl. Rar. [Link, Klotzsch & Otto] 1: 97, t. 39. 1844.

Subshrubs, shrubs or trees up to 18 m tall, unarmed, glabrous or pubescent with or without stipitate glands. Leaves bipinnate. Pinnae 1-15 pairs per leaf, plus a terminal one. Leaflets 2-20 pairs per pinnae, leaf margin with black sessile gland, with a crenulated appearance or glandless. Inflorescences axillar or terminal, arranged in racemes. Flowers hermaphrodite, zygomorphic, bright-yellow to whitish-yellow or pink, the banner sometimes dyed red-orange. Calyx dialysepal, sepals 5, with or without stipitate glands. Corolla of 5 free reflexed petals, with or without stipitate glands abaxially. Stamens 10, free, the filaments hairy, with or without stipitate glands. Ovary pubescent, with or without stipitate glands, both, androecium and gynoecium free, not cupped in the lower cucullate sepal. Pod 2.5–12 × 1–3 cm, oblong to elliptic, coriaceous, with or without stipitate glands.

An American genus of 31 species in which the species previously belonging to *Poincianella* are included [5], distributed from south USA, through Mexico and Central America to South America.

1A.	Herbaceous perennial or subshrubs; many stems rising from the base; terminal pinna much larger than lateral pinnae; leaflets abaxially with dark glands, or only one at apex	***E. caudatus***
1B.	Shrubs; stems woody; terminal pinnae equal in size to lateral pinnae or only slightly longer; leaflets abaxially without dark glands	2
2A.	Flowers laterally compressed	***E. exostemma*** ssp. ***tampicoana***
2B.	Flowers not laterally compressed	3
3A.	Flowers 2.2-3.2 cm long; stamen filaments 7-12 cm long; exotic species	***E. gilliesii***

 doi:10.20944/preprints202404.0408.v1

3B.	Flowers 12 mm long or shorter; stamen filaments 13 mm long or shorter; native species	4
4A.	Perennial herbaceous or subshrub, 80 cm tall or less, rhizomatous, colonial habit; leaflets obovate-elliptic; inflorescence without glands, except at the base of the calyx and apex of the pedicels (glandular-stipitate); stamens 9-10 mm long; fruits orbicular, 2.5 cm long; seeds 1-2	***E. phyllantoides***
4B.	Shrubs or trees, 1 m tall or more, never rhizomatous; leaflets obovate-elliptic, oblong-elliptic to orbicular; inflorescence rachis and pedicels without glands; stamens 10 mm long or longer; fruit oblong, 4-8 cm long; seeds 3-6	***E. mexicanus***

Erythrostemon caudatus (A. Gray) E. Gagnon & G. P. Lewis, Phytokeys 71. 120. 2016. Basionym. *Hoffmannseggia caudata* A. Gray, Boston J. Nat. Hist. 6: 179. 1850. *Caesalpinia caudata* (A. Gray) E. M. Fisher, Bot. Gaz. 18: 123. 1893. *Schrammia caudata* (A. Gray) Britton & Rose, N. Amer. Flora 23(5): 317. 1930.

Type: USA, Texas, western Texas to El Paso, New Mexico, V-1849, *Wright 146* (Isotype: K81717!).

Distinguishing features: Herbaceous, perennial, woody at base, up to 1 m tall, glabrate and sparsely glandular. Pinnaea 2-4 pairs per leaf, plus one terminal pinnae longer than the lateral ones: Leaflets 3-7 pairs in the lateral pinnae, and 8-20 pairs in the terminal pinnae, glabrous, prominently veined and with dark glands abaxially or glands absent but their apex gland-tipped, also, a gland present at base of each insertion of each pair of petiolules. Inflorescences axillar or terminal, arranged in racemes. Flowers yellow. Calyx 5-merous, the lobes fimbriate, the lower sepal cucullate. Corolla of 5 petals, the blades glabrous, the claws marginally pubescent and densely glandular with subglobose glands dorsally. Stamens 10, hairy basally. Fruit 2.5-4.5 cm long, flattened, explosively dehiscent, with sparse pubescence and sessile and stalked glands.

Representative examined material: Coahuila: 15-IV-1999, *A. Mora-Olivo 7519* (UAT). Nuevo León: 17-IV-1939, *T.C. Frye 2380* (IND-49057!); 26-XI-1966, *Ripley & Barneby 14783a* (NY!); 17-III-1962, *J.G. Rivas* (TEX260203!); 24-III-1062, *M. Dominguez M. 8206* (TEX260204!).

Comments: Endemic to northeastern Mexico and south of Texas. In low plains, with Tamaulipan thornscrub and mezquite woods, 80-300 m. In Mexico, recorded only in the states of Nuevo León and Coahuila.

Erythrostemon exostemma ssp. ***tampicoanus*** (Britton & Rose) E. Gagnon & G. P. Lewis. PhytoKeys 71: 122. 2016. Basionym. *Poincianella tampicoana* Britton & Rose, N. Amer. Fl. 23(5): 330. 1930. *Caesalpinia tampicoana* (Britton & Rose) Standl., Publ. Field Mus. Nat. Hist., Bot. Ser. 11(5): 159. 1936. *Caesalpinia exostemma* subsp. *tampicoana* (Britton & Rose) G. P. Lewis), Roy. Bot. Gard. 72. 1998.

Type. Mexico, Veracruz, vicinity of Pueblo Viejo, 2 km S of Tampico, 1/2-VI-1910. *Palmer 556* (Holotype: NY4615!).

Distinguishing features: Shrub or tree, up to 10 m tall, with simple and stellate or plumose hairs mixed with stipitate glands. Pinnae 2-5 pairs per leaf, plus one terminal. Leaflets 3-6 pairs per pinnae, without glands, but the margin revolute and sparsely glandular. Inflorescences terminal or lateral, arranged in racemes. Flowers yellow, laterally compressed. Calyx soon caducous, gibbous, pink-salmon to orange. Banner orbicular to ovate, lacking apical appendage, stained dark scarlet and orange in the central part, the lateral petals with stipitate glands on claw margin and in the lower part of the blade margin. Stamen filaments bicolored, hairy white basally, red in the distal half. Fruit 6-7.8 × 1.5-1.8 cm, dehiscent explosively, with or without glands.

Representative examined material: Tamaulipas: 3-I-1939, *LeSueur 188* (F!); 3-III-1961, *King 4015* (NY3570607!); 15/I-1/VI-1910, *E. Palmer 556* (NY4615!, in Pueblo Viejo, Veracruz, town adjacent to Tampico, separted only by the Pánuco river).

 doi:10.20944/preprints202404.0408.v1

Comments: Recorded only in the south of the state of Tamaulipas, in deciduous woodlands, 30-100 m. Out of the area, it distributes in Veracruz.

Erythrostemon gilliesii (Hook.) Klotzsch, Ic. Pl. Rar. Horti. Berol. 2 (3): 97, t. 39. 1844. Basionym. *Poinciana gilliesii* Wall. ex Hook., Bot. Misc. 1: 129. 1830. *Caesalpinia gilliesii* (Hook.) D. Dietr., Synop. Pl. 2: 1495. 1840.

Type: France, Hort. Monsp., 2-VIII.1836, non collector (Isonsyntype: MPU023330!)

Distinguishing features: Shurb, 1-3 m tall, unarmed. Stems and branches glandular-pubescent: Pinnae 7-15 pairs plus one terminal per leaf. Leaflets 7-12 pairs per pinnae, subfleshy. Inflorescences terminal, arranged in racemes, with abundant stipitate glands. Flowers yellow with light red tones. Calyx 5-merous, up to 2.5 cm long. Petals obovate, up to 3 cm long. Stamens 10, the filaments red, 7-11 cm long, basally hairy. Fruit 5-7 × 1-2 cm, flattened, oblong, straight or falcate, elastically dehiscent, with abundant yellow, red or brown pedicellate glands.

Representative examined material: Coahuila: 8-VI-1984, *A. Rodríguez 123 (*ANSM*)*; 9-V-1987, *A. Rodríguez 3697 (*ANSM). Nuevo León: 15-X-1987, *E. Estrada 362* (ANSM).

Comments: Exotic species, native of South America (Argentina or Uruguay) (Lewis, 1998). Widely used in northeatetern Mexico as ornamental, in private and public gardens. Sometimes growing in disturbed places.

Erythrostemon mexicanus (A. Gray) E. Gagnon & G. P. Lewis, PhytoKeys 71: 124. 2016. Basionym. *Caesalpinia mexicana* A. Gray, Proc. Amer. Acad. Arts 5: 157. 1861. *Poinciana mexicana* (A. Gray) Rose, Contr. U.S. Natl. Herb. 13: 303. 1911. *Poincianella mexicana* (A. Gray) Britton & Rose, N. Amer. Fl. 23(5): 330. 1930.

Type: Mexico, Nuevo León, near Monterrey, 11-II-1847, *Gregg s.n.* (lectotype GH59862!). Mexico, *non date, Berlandier 341* (Syntype: K81700!).

Distinguishing features: Shrub or tree up to 7 m tall, unarmed. Leaves bipinnate. Pinnae 2-3 pairs per leaf plus 1 terminal. Leaflets 3-5 pairs per pinna. Inflorescences axillar and/or terminal, arranged in racemes. Flowers yellow. Calyx 5-merous, sepals 6-10 mm long, densely pubescent internally. The largest petal (banner) with reddish tones at the base, the remaining subequal, obovate, short and widely unguiculated, with stipitate glands at the base. Stamens 10, free, the filaments broadened and pubescent at the base. Fruit 4-7 × 1.5-2.2 cm, oblong, straight, flattened, with sessile or pedicellate glands, elastically dehiscent.

Representative examined material: Coahuila**:** 12-IX-1991, *M.A. Carranza s.n.* (ANSM)**.** Nuevo León: Agualeguas: 2-IV-2002, *E. Estrada 13400* (CFNL); 21-III-2002, *E. Estrada 13316* (CFNL); 5-VII-2001, *C. Yen y E. Estrada 12860* (CFNL); 5-VII-2001, *C. Yen y E. Estrada 12846* (CFNL). Tamaulipas: 10-XI-2006, *J. Encina 1674, I Ramirez, F.J. Diaz* (CFNL); 9-III-1985, *J. Jimenez 002* (CFNL); 21-VIII-1991, *E Estrada 2093, J. Fairey, C. Schoenfeld* (CFNL); 23-IV-2009, *E. Estrada 20774* (CFNL); 6-VI-1987, *A. Mora-Olivo 7246* (UAT); 4-IX-1985, *M. Martínez 849* (UAT); 21-II-1998, *M. Galván* 690 (UAT).

Comments: From southeastern Texas, through NE Mexico to Querétaro, Hidalgo, and Veracruz. In Tamaulipan thornscrub, piedmont scrub, and sometimes in desert scrublands, 290-1500 m. It is popularly known as "*potro*'' or "*yerba del potro*". Used as ornamental in private, public gardens, and sidewalks.

Erythrostemon phyllanthoides (Standl.) E. Gagnon & G. P. Lewis, 71: 12-126. 2016. Basionym: *Caesalpinia phyllanthoides* Standl., Contr. U.S. Natl. Herb. 23: 425. 1922. *Poincianella phyllanthoides* (Standl.) Britton & Rose, N. Amer. Fl. 23(5): 332. 1930.

Type: Mexico, Tamaulipas, Hacienda Buena Vista, 18-VI-1919, *Wooton s.n.* (Holotype: US2606!; Isotype NY22389!).

Distinguishing features: Herbaceous to subshrub, rhizomatous, forming colonies, up to 80 cm tall. Leaves bipinnate with 3-4 pairs of pinnae per leaf. Leaflets 2-3 pairs per pinnae, glabrous, with a minute gland at base of each petiolule. Inflorescences axillar or distal, arranged in racemes, lacking glands, except at the base of the calyx and apex of the pedicels (glandular-stipitate). Flowers yellow. Calyx stipitate glandular, the lobes fimbriate-glandular marginally. Petals obovate, the banner claw pubescent marginally, its blade with few glands marginally near base. Fruit 2.5 cm long, orbicular.

 doi:10.20944/preprints202404.0408.v1

Representative examined material: Tamaulipas: 26-IV-1960, *Crutchfield & Johnston 5343* (MEXU); 8-II-1960, *Crutchfield & Johnston 5071* (MEXU); 18-VI-1914, *E.O. Norton?* (NYBG).

Comments: endemic to southeastern Texas and Tamaulipas, in Tamaulipan thornscrub, 100-300 m.

Gleditsia L., Sp. Pl. 2: 1056-1057. 1753.

Shrubs or trees, commonly dioecious, deciduous. Trunks and branches are sometimes armed with strong thorns, simple or branched. Branches flexouse (zigzag). Leaves alternate or apparently fasciculated, pinnate or bipinnate. Leaflets with entire or crenate margin. Inflorescences axillar, arranged in racemes, panicles, or solitary. Flowers unisexual, with separate sexes or polygamous. Staminate inflorescences with abundant congested flowers. Calyx 3-5-merous. Petals as many as the teeth of the calyx, greenish or light yellow, inserted on the margin of the throat. Pistillate flowers with 4-10 staminodes, tiny and abortive anthers. Fruit elliptical, compressed, straight or curved, leathery, indehiscent or tardly dehiscent, septate between the interseminal spaces or continuous.

Genus of 13-16 species; three in northeastern North America, five in eastern and southeastern Asia, two in China, one in Burma and Vietnam [4].

Only one species recorded in Mexico, *Gleditsia triacanthos* L.

Gleditsia triacanthos L., Sp. Pl. 2: 1056. 1753. Basionym: *Acacia triacantha* Hochst. ex A. Rich., Tent. Fl. Abyss. 1: 244. 1847. *Caesalpiniodes triacanthum* (L.) Kuntze, Revis. Gen. Pl. 1: 167. 1891. *Gleditsia ferox* Desf., Hist. Arb. ii. 247. Rehder. *Gleditsia triacanthos* L. var. *brachycarpos* Michx., Fl. Bor.-Amer. (Michaux) 2: 257. 1803. *Gleditsia triacanthos* var. *aquatica* (Marshall) Castigl., Viagg. Stati Uniti 2: 249. 1790. *Gleditsia triacanthos* var. *bujotii* Rehder in L.H.Bailey, Cycl. Amer. Hort. [L.H.Bailey] 2: 650. 1900. *Gleditsia triacanthos* var. *horrida* Aiton, Hort. Kew. [W. Aiton] 3: 444. 1789. *Gleditsia triacanthos* var. *inermis* (L.) Castigl., Viagg. Stati Uniti 2: 249. 1790. *Gleditsia triacanthos* var. *laevis* Sudw., Bull. Div. Forest. U.S.D.A. 14: 254. 1897. *Gleditsia triacanthos* var. *monosperma* Aiton, Hort. Kew. [W. Aiton] 3: 444.1789. *Gleditsia triacanthos* var. *macrocarpos* Michx., Fl. Bor.-Amer. (Michaux) 2: 257. 1803. *Gleditsia triacanthos* var. *polysperma* Aiton, Hort. Kew. [W. Aiton] 3: 444. 1789.

Type*:* France, Hort. Paris, non date, non colector (Isotype: A00066187!).

Distinguishing features: shrub or tree, up to 8 m tall, stems and branches armed with simple or branched spines in cross shape. Leaves pinnate or bipinnate. Pinnae 4-8 pairs per leaf. Leaflets 11-25 per pinna, margin entire or slightly crenulate. Inflorescences axillar, arranged in spiked racemes. Calyx 5-merous, the sepals free. Petals 4-5, up to 3-5 mm long, longer than calyx, yellowish-green or yellow. Stamens 10, free, inserted in the calyx tube, anthers of the pistillate flowers abortive. Fruit 10-35 cm long, flattened, linear-oblong, indehiscent, dark brown, shiny, leathery, with succulent pulp between the seeds.

Representative examined material: Coahuila: 20-IV-2011, *J.A. Encina 2872* (ANSM). 4-VIII-1984, *M.A. Carranza 150* (ANSM). Nuevo León: 16-IV-01, *C. Yen y E. Estrada 12378* (CFNL); 10-IV-2008, *E. Estrada 20170* (CFNL); 8-II-2009, *E. Estrada 20736* (CFNL). Tamaulipas: 6-VIII-1985, *E.M. Marsh 2006* (TEX-LL); 15-VI-1985, *O. Briones 1795* (CFNL); 27-IV-1988, *E. Estrada 1417* (CFNL).

Comments: In the state of Nuevo León it is known from isolated localities, from the Villadlama County [66], and Juarez County (Cerro La Silla), associated to *Quercus, Juniperus* and *Fraxinus* forest. In Tamaulipas it is recorded for the Sierra de San Carlos [57], adjacent to the state of Nuevo León, 950-1300 m. En Coahuila it is recorded from the Sierra Santas Rosa (Municipality of Muzquiz), inhabiting Juniperus-oak forest.

Guilandina L., Sp. Pl.: 381. 1753. *Bonduc* Mill., Gard. Dict. Abr., ed. 4. [textus s.n.] 1754. *Caesalpinia* subgenus *Guilandina* (L.) Gillis & Proctor, J. Arnold Arbor. 55(3): 426 1974.

Type: *Guilandina bonduc* L., Sp. Pl. 1: 381. 1753.

Monoecious climbers, lianas or trailing shrubs, armed with prickles, commonly forming dense colonies. Stems and branches armed with curved spines, and a pair of spines below leaf base. Leaves bipinnate, with a pair of prickles in the insertion of pinnae and leaflets. Inflorescences supra-axillar or distal, arranged in racemes. Flowers yellow, unisexual, zygomorphic to sub-actinomorphic, the female ones staminate but sterile, the male ones with not functional pistil. Calyx 5-merous, the sepals valvate in bud, the lower one cucullate. Corolla zygomorphic or sub-actinomorphic, petals 5, similar

 doi:10.20944/preprints202404.0408.v1

or frequently longer than sepals. Stamens 10, free, basally hairy. Fruit oblong to elliptic, swollen, frequently armed with spines (spinescent bristles). Seeds 1-4, ellipsoid, subspheric to obovoid, orange, gray to brown, shiny.

Genus not fully studied is its taxonomy, still with an indeterminate number of species, varying between 7 to 19 [5], with pantropical distribution, the species are widely distributed in Asia, Indo-China, Japan, South Africa, Central America, Caribbean region, Madagascar and Australia.

In northeastern Mexico only one species is recorded, *Guilandina bonduc.*

Guilandina bonduc L. Sp. Pl. 1: 381. 1753.

Type: Sri Lanka, *P. Herman, s.n.* (Lectotype: BM621929!)

Distinguishing features: Subshrubs, creeping, up to 6 m long, forming dense colonies. Stems and leaves armed with recurved prickles, the young branches setoso-spinescent. Leaves bipinnate. Pinnae 4-8 pairs per leaf. Leaflets 4–8 pairs per pinnae. Inflorescences axillar, arranged in racemes. Flowers yellow to green-yellow. Calyx pubescent. Fruit 5-10 × 4–6 cm, ovate, compressed but little swollen, spinescent, brown, tardly dehiscent. Seeds usually 2, up to 2 cm diameter, obovoid, gray, shiny.

Representative examined material: Tamaulipas: 14-IV-2023, *E Estrada 26080, C. Yen* (CFNL); 30-IX-1986, *D. Baro 900* (UAT); 18-VII-2018, *Castillo Campos J. Pale 26710* (MEXU).

Comments: recorded only in the state of Tamaulipas, in coastal areas, forming dense tickets. Pantropical distribution, in coasts and evergreen tropical forest, and along streams. In Mexico along the Pacific and Gulf of Mexico coasts, also in Puebla, and San Luis Potosí.

Haematoxylum L., Sp. Pl. 1: 384. 1753. *Cymbosepalum* Baker, Bull. Misc. Inform. Kew 1895(100-101): 103. 1895.

Type: *Haematoxylum campechianum* L., Sp. Pl. 1: 384. 1753.

Shrubs or trees, up to 13 m tall. Branches armed, the spines straight and triangular. Leaves alternate, pinnate (in northeastern Mexico), leaflets 2-6 pairs per leaf, obovate, when bipinnate (very rarely so) leaves, pinnae 1–3 pairs per leaf plus one terminal pinnae. Leaflets 2-6 pairs per pinnae, obovate. Inflorescences axillar or distal, arranged in racemes or panicles. Flowers yellow, light-yellow to white, hermaphrodite. Calyx 5-merous, sepals caducous, eglandular or glandular, the lower sepal cucullate and slightly covering the other 4 sepals in bud. Corolla of 5 petals, obovate. Stamens 10, free, filaments hairy in the basal half. Fruit 1-5 × 0.5-1.5 cm, flattened, chartaceous to membranaceous, dehiscing along the middle of the valves or near the margin, never along the sutures. Seeds 1-3, flattened.

Genus of five species, four in the tropics of America and one endemic to Namibia [67] in semi-deciduous woods, dry tropical scrublands, thorn scrub, riparian areas.

Haematoxylum brasiletto H. Karst., Fl. Columb. (H. Karst.) 2(1): 27, t. 114. 1862. Basionym. *Haematoxylum boreale* S. Watson. Proc. Amer. Acad. 21: 426. 1886.

Type: Mexico, SW Chihuahua, VIII-1885, *E. Palmer 247-G* (MEXU53568!; GH00066159!; US375571!).

Distinguishing features: Shrub or tree, up to 10 m tall, armed with dark, straight prickles. Leaves pinnate, very rarely bipinnate, up to 7 cm long. Leaflets 3-4 pairs per leaf, obovate. Calyx red, the sepals caducous. Petals as long as the stamens. Fruit 2-6 cm long, oblong, flattened, straight, glabrous, opening along the middle of the valves or parallel to the margin chartaceous, acute at both ends.

Representative examined material: Tamaulipas: 1-V-1969, *F. González M. 2303* (MEXU).

Comments: Rare in northeastern Mexico, only one collection of the central-south in the state of Tamaulipas, near Cruillas town, with tall sub thorn scrub, 500 m.

Hoffmannseggia Cav., Icon 4: 63. Table 392. 1798. *Larrea* Ort., Nov. Pl. Descr. Dec. : 15, t. 2. 1797.

Type: *Hoffmannseggia glauca* (Ortega) Eifert. Sida 5: 43. 1972.

Herbaceous perennials or unarmed subshrubs, frequently with orange glands. leaves bipinnate, imparipinnate. Pinnae 1-13 pairs per leaf. Leaflets 4-13 pairs per pinnae. Inflorescences arranged in terminal racemes, with or without pedicellate glands. Flowers 5-merous, yellow or reddish-yellow or salmon color, hermaphrodite, zygomorphic. Calyx with a short tube, the lobes slightly imbricate or

 doi:10.20944/preprints202404.0408.v1

valvate, pubescent with simple trichomes, glandular-multicellular or both, abaxially and on margins, generally persistent even in fruiting. Petals 5, free, subequal, unguiculate and spatulate, with glandular hairs at the base. Stamens 10, subequal, free, as long as the corolla, filaments with glandular or villous. Fruit lunate, arched, rectangular, straight or oblong, reticulate, glabrous or pubescent with simple and/or glandular trichomes, these usually capitate and subsessile.

Based on molecular studies (plastid and ribosomal marker) [5], evidence the affinities between genera of the *Caesalpinia* group, showing that although *Pomaria* and *Hoffmannseggia* are closely related phylogenetically, *Pomaria* is more closely related to *Caesalpinia* (*Erythrostemon* group) than to *Hoffmannseggia*, while the latter is more phylogenetically related to others genera such as *Balsamocapron* (endemic to Chile), *Zuccagnia* (endemic to Chile and Argentina), *Libidibia* (neotropical genus), and *Stenodrepanum* (endemic to Argentina). In their dichotomous keys to recognize the genera of the *Caesalpinia* group, *Hoffmannseggia* and *Pomaria* share similar morphological characters such as bipinnate, odd-pinnate leaves, herbaceous and unarmed habit, and differentiated by the persistence of the sepals during fruit development, persistent in *Hoffmannseggia* and deciduous in *Pomaria*.

Genus of 22 species [68] with amphitropical distribution; 11 species recorded for Mexico and 11 in South America [58].

1A.	Subshrubs, woody at least basally; flowers arising on the branches; fruit ovate-angled, lunate or arched, dehiscent, its valves rarely curling longitudinally after dehiscence	***H. drummondii***
1B.	Perennial herbaceous; flowers arising on peduncles from the base of the plant; fruit lunate, arched, orbicular to unequally ovate-angled in profile, indehiscent or dehiscent with the valves curling longitudinally after dehiscence	2
2A.	Sepals and pedicels strigose or tomentose, without obvious glandular trichomes	3
3A	Fruit oblong, rectangular, straight, apically acute	***H. watsonii***
3B	Fruit strongly arcuate, apically rounded	***H. drepanocarpa***
2B.	Sepals and pedicels with evident glandular multicellular trichomes	4
3A.	Petals with evident glandular trichomes in the base; legume slightly arched, indehiscent, sparsely tomentose	***H. glauca***
3B.	Petals without glandular trichomes in the base, or only the banner with few glandular trichomes; legume rectangular or arched, with abundant glandular trichomes	4
4A.	Legume rectangular, reticulate-veined, indehiscent; leaflets usually strigous or villous	***H. gladiata***
4B.	Legume arched, dark reticulate-veined, dehiscent; leaflets generally glabrous	***H. oxycarpa*** ssp. ***oxycarpa***

Hoffmannseggia drepanocarpa A, Gray, Pl. Wright. 1; 58, 1852. Basionym: *Caesalpinia drepanocarpa* (A. Gray) Fisher, Bot. Gaz, 18: 122. 1893. *Larrea drepanocarpa* (A. Gray) Britton & Rose, N. Am. Fl. 23(5); 312. 1930.

Type: USA, El Paso, V-1851, *C. Wright 1027* (Isotype: K000264559!, K000264555!; NY00431789!; GH00103085!. Lectotype: GH00263369!. Isolectotype: GH00103085!).

Distinguishing features: Herbaceous, perennial. Interondes very short. Stems up to 30 cm long, young stems and leaf rachis glabrescent. Pinnae 4-9 pairs plus one terminal per leaf. Leaflets 6-9 pairs per pinnae, 1-5.5 x 1-2.3 mm, glabrous or pubescent. Inflorescences arranged in terminal racemes, 6-27 cm long, the rachis and pedicels strigose. Flowers yellow, commonly tinged with red, turbinate in

 doi:10.20944/preprints202404.0408.v1

lateral view. Calyx lobes 3-5 mm long. Banner 5-8 mm long, with a small tuft of trichomes in the claw adaxially. Lateral petals 6.5-8 x 2-5 mm. Stamnes 3-5 mm long, with projections in the lower half. Ovary glabrate. Style shortly pubescent. Fruit 2-4 x 0.5-0.8 cm, falcate or forming a complete circle, parallel margined, recticulately veined, light-brown to reddish, apically rounded, pulverulent. Seeds 6-10, 4 x 2.5 mm, ovate, brown.

Representative examined material: Coahuila: 1-IX-1938, *I.M. Johnston 7280* (GH).

Hoffmannseggia drummondii Torr. & A. Gray, Fl. N. Amer. 1(3): 393. 1840. Basionym: *Caesalpinia drummondii* (Torr. & A. Gray) Fisher, Bot. Gaz. 18: 123. 1893. *Larrea drummondii* (Torr. & A. Gray) Britton, N. Amer. Fl. 23(5): 311. 1930. *Hoffmannseggia texensis* Fisher, Contr. U.S. Natl. Herb. 1: 147. 1892. *Caesalpinia texensis* (Fisher) Fisher, Bot. Gaz. 18: 123. 1893. *Larrea texensis* (Torr. & A. Gray) Britton, N. Amer. Fl. 23(5): 311. 1930.

Type: USA, New Mexico, Piedernales, *T.S. Drummond s.n.* (Holotype: NY431810!). Isotype: USA, United States, 1835, *Drummond 149* K264552!, GH103086!).

Distinguishing features: Dwarf subshrub, woody basally, young parts and leaf rachis with multicellular glandular trichomes. Pinnae 1 pair, plus one terminal per leaf. Leaflets 3-6 pairs per pinnae, sometimes with few multicellular glandular trichomes abaxially. Inflorescences lateral or terminal, arranged in racemes, the rachis and pedicels with multicellular glandular trichomes. Flowers turbinate in lateral view. Calyx persistent along with the fruit, the sepals with few multicellular glandular trichomes. Petals yellow, the banner with additional red tones, its claw with few multicellular glandular trichomes dorsally, lateral petals with similar trichomes. The filaments (stamens) with retrorse dendritic trichomes. Fruit lunate or arched, broadest in the middle, dehiscent, the valves brown, subglabrous, coiled outward.

Representative examined material: Tamaulipas: 10-XII-1959, *M.C. Johnston 4934* (MEXU); 12-XII-1959, *M.C. Johnston 4987, J. Crutchfield* (TEX).

Comments: Endemic to northeastern Mexico and southeastern Texas, in scrublands, 200-600 m.

Hoffmannseggia glauca (Ort.) Eifert, Sida 5(1): 43. 1972. Basionym: *Larrea glauca* Ort., Nov. Pl. Descr. Dec. 2: 15-16, pl. 2. 1797. *Caesapinia glauca* (Ortega) O. Kuntze, Revis. gen. pl. 3(2): 52. 1898. *Hoffmannseggia falcaria* Cav. Icon. Descr. Pl. 4: 63. Tab 392. 1798. *Hoffmannseggia stricta* Benth., in A. Gray, Pl. wright 1: 56. 1852. *Hoffmannseggia falcaria* Cav. var. *stricta* (Bent. In A. Gray) Fisher, Contr. U.S: Natl. Herb. 1: 144. 1892. *Hoffmannseggia densiflora* Benth. in A. Gray. Pl. wright. 1: 55. 1852. *Larrea densiflora* (Benth.) Britton. N. Amer. Fl. 23(5): 311. 1930.

Type: Unknown Country [Perú?], 1794, *L. Née, s.n.* (MA654597!)

Distinguishing features: Perennial, herbaceous, up to 30 cm tall, erect, subscapose or caulescent, pubescent and with glandular trichomes. Pinnae 3-13 pairs per leaf, plus one terminal one. Leaflets 4-13 pairs per pinna, pubescent, with pedicellate orange glands. Inflorescences terminal, arranged in racemes. Flowers yellow, bending down with age. Calyx 5-merous, sepals free, glandular-pubescent. Petlas free, sub-equal, sometimes red-dyed, banner with few simple trichomes on the internal base, and glandular trichomes on the base and back, lateral petals with multicellular glandular trichomes on margin and base of dorsal surface. Stamens subequal to the petals, with dendritic trichomes basally and middle portion. Fruit 2-4 × 0.5-0.8 cm, falcate or rectangular, flattened, indehiscent, tomentose, with few glandular trichomes, persistent, light or dark brown.

Representative examined material: Coahuila: Coahuila: 1-IX-2007, J.I. *Calzada 24965* (ANSM), 7-VIII-1973. *J. Henrickson 12093b* (ANSM). Nuevo León: 5-VIII-1993, *E. Estrada 2452* (CFNL); 1-VII-1999, *E. Estrada 10963* (CFNL); 31-V-2003, 21-VI-2003, *E. Estrada 15772* (CFNL); 7-IV-1999, *E. Estrada 10143* (CFNL). Tamaulipas 24-V-1959, *D. Seigler, E. Rodríguez 1286* (TEX); 7-XII-1993, *A. Mora-Olivo 5033* (UAT).

Comments: Widely distributed in southern USA, frequent in north of Mexico and extending to the south, through the states that are along the high plains to Puebla. Frequent in desert scrublands, halophytic grasslands, and Tamaulipan thorn scrub, 280-2200 m. In South Amercica distirbuted in Perú, Chile and Argentina (Simpson, 1999).

Hoffmannseggia gladiata Benth. in A. Gray, Pl. wright. 1: 57. 1852. Basionym: *Caesalpinia gladiata* (Benth.) Fisher, Bot. Gaz. 18: 122. 1893. *Larrea gladiata* (Benth.) Britton; N. Amer. Fl. 23(5): 314. 1930.

 doi:10.20944/preprints202404.0408.v1

Hoffmannseggia platycarpa Benth., in A. Gray, Pl. Wright. 1: 57. 1852. *Larrea platycarpa* (Benth.) Britton, N. Amer. Fl. 23(5): 314. 1930. *Pomaria humilis* M. Martens & Galeotti. Bull. Acad. Roy. Sci. Bruxelles 19 (Ser. 1) Par. 2: 303. 1843. *Hoffmannseggia humilis* (M. Martens & Galeotti) Hemsley, Biol. Centr.-Amer. Bot. 1: 326. 1880. *Larrea humlis* (M. Martens & Galeotti) Britton, N. Amer. Fl. 23(5): 316. 1930. *Larrea potosina* Britton, N. Amer. Fl. 23(5): 313. 1930. *Larrea pueblana* Britton, N. Amer. Fl. 23(5): 313. 1930. *Hoffmannseggia pueblana* (Britton) Britton, Publ. Field. Mus. Nat. Hist. Bot. Ser. 11(5): 160. 1936. *Larrea villosa* Britton, N. Amerc. Fl. 23(5): 313. 1930.

Type: Mexico, *Coulter s.n.* (Isotype: K264535!).

Distinguishing features: Herbaceous perennial. Stems up to 18 cm long, pubescent, mixed with glandular trichomes. Pinnae 3-13 pairs per leaf, plus one terminal. Leaflets 4-7 pairs per pinna. Inflorescences terminal, arranged in racemes, the rachis strigose mixed with multicellular glandular trichomes. Flowers yellow. Calyx with oblong sepals, with reddish multicellular glandular trichomes. Banner with few glandular trichomes basally, lateral petals sometimes red-dyed, with few glandular trichomes adaxially only at the base. Stamens filaments with dendritic trichomes basally. Fruit 1-3 × 0.5 cm, rectangular with parallel margins, slightly arched, compressed, indehiscent, reticulate-veined, reddish with the age, glandular-pubescent.

Representative examined material: Nuevo León: 15-III-1981, *G.B. Hinton* et al. *18131* (TEX). Tamaulipas: 20-V-1971, *M.C. Johnston et al., 11147* (TEX).

Comments: Endemic to Mexico, from Nuevo León, through Querétaro and Guanajuato to Puebla. In northeastern Mexico recorded in desert scrub and chaparral communities, 2400 m.

Hoffamnsseggia oxycarpa Benth. in A. Gray ssp**. *oxycarpa*,** Pl. Wright 1: 55. 1852. Basionym: *Caesalpinia oxycarpa* (Benth.) Fisher, Bot. Gaz. 18: 122. 1893. *Larrea oxycarpa* (Benth.) Britton, N. Amer. Fl. 23(5): 312. 1930.

Type: Mexico, Monterrey, non date, *L.A. Edwards, J.H. Eaton 12* (Isolectotype: GH62317!).

Herbaceous perennial, suffruticose. Stems up to 40 cm long, densely villous and red or yellow glandular, multicellular trichomes. Pinnae 1-4 pairs of pinnae plus one terminal per leaf. Leaflets 4-9 pairs per pinnae. Inflorescences terminal, arranged in racemes. Flowers yellow. Sepals oblong, villous, mixed with multicellular glandular trichomes. The banner with red dye, glabrous, but with few glandular trichomes at the base in the external side, lateral petals without glandular trichomes. Stamen filaments with retrorse dendritic trichomes in the basal portion. Fruit 1-3.6 × 0.5-0.7 cm, falcate, arched, dehiscent, dark reticulated-veined, reddish-brown, pubescent, mixed with capitate glandular trichomes.

Representative examined material: Coahuila: Coahuila: 18-IV-1992, *J.A. Villarreal 1368a* (ANSM), 11-IX-1991, *M.A. Carranza s.n.* (ANSM). Nuevo León: 15-IV-2001, *C. Yen y E. Estrada 12932* (MEXU); 14-VII-2002, *C. Yen y E. Estrada 14900* (MEXU); 7-IV-1980, *E. Bridges, L. Woodruff 13132* (TEX-LL); 7-IV-1962, *M. Domínguez, Wm. McCart 8226* (TEX-LL). Tamaulipas: 7-IV-1962, *M. Dominguez, M.W. McCart 8226* (TEX).

Comments: Endemic to northeastern Mexico and southern Texas, in low plains 360-500 m, with Tamaulipan thornscrub, and high plains, 1500-2000 m, with desert scrublands, halophytic grasslands, rosteophyllous scrub. Frequent in calcareous soils with low cover vegetation.

Hoffmannseggia watsonii (Fisher) Rose, Contr. U.S. Natl. Herb. 10(3): 98. 1906. Basionym: *Caesalpinia watsonii* Fisher, Bot. Gaz. 18(4): 122. 1893. *Larrea watsonii* (Fisher) Britton, N. Amer. Fl. 23(5): 312 1930.

Type: Mexico, Coahuila, Sierra Madre, south of Saltillo, II-1880, *E. Palmer 275* (Lectotype: GH103088!; Isolectotype: K264531!).

Distinguishing features: Herbaceous perennial, up to 28 cm long, branched from the base, prostrate or decumbent, without glands or with few scattered sessile glands. Pinnae 3-9 pairs of pinnae per leaf, plus one terminal. Leaflets 5-7 pairs per pinnae, adaxially glabrous, subglabrous-pubescent abaxially. Inflorescences terminal, arranged in racemes. Flowers, orange, red-orange or red-salmon. Sepals suboblong, reddish on the margin, with abundant short coiled trichomes on the back. Banner broad, short cap-shape, glabrous, lateral petals of similar size. Stamen filaments with

 doi:10.20944/preprints202404.0408.v1

retrorse dendritic trichomes almost the entire length. Fruit 1.5-3 × 0.6 cm linear-oblong, flattened, straight, apically acute or rounded, sometimes with few glandular trichomes.

Representative examined material: Coahuila: 7-VII-1995, *G. Hinton 25354* (ANSM), 5-VI-1990, *J.A. Villarreal 5686* (ANSM)**.** Nuevo León: 21-VI-1988, *E. Estrada 1550* (CFNL); 30-VI-2012, *E. Estrada 22355* (CFNL); 8-VII-2003, *E. Estrada 15802* (CFNL); 4-VIII-1999, *E. Estrada 10499* (CFNL); 27-VI-1989, *E. Estrada 1616* (CFNL).

8-VII-2003, *C. Yen y E. Estrada 15802* (CFNL); 27-VII-1989, E. Estrada C. 1616 (CFNL; TEX-LL); 1-VII-1999, *C. Yen y E. Estrada 10980* (CFNL).

Comments: Endemic to Mexico. Recorded only in the states of Coahuila and Nuevo León, in gypsophilous and halophytic grassland, associated with prairie dog (*Cynomys mexicanus*) colonies. Also in Tamaulipan thornscrub, desert scrublands, on calcareous soils with *Pinus* and *Juniperus*, 370-2220 m. Also recorded for Guanajuato and Hidalgo.

Parkinsonia L., Sp. Pl. 1: 375. 1753. *Cercidium* Tul., Arch. Mus. Hist. Nat. 4:133. 1844. *Cercidiopsis* Britton et Rose, N. Amer. Fl. 23: 306. 1930.

Type: *Parkinsonia aculeata* L., Sp. Pl. 1: 375. 1753.

Shrubs or trees, up to 15 m tall. Bark green. Branches sometimes in zigzag, armed with two types of thorns, ones short, due to modification of stipules, the other ones, long, due to modification of petiole and rachis. Leaves with the rachis long and dorsoventrally flattened (winged) or cylindrical and short, sessile, subsessile or petiolate, fasciculated or alternate. Pinnae 1-3 pairs per leaf. Leaflets few or numerous, generally deciduous. Inflorescences axillar, arranged in racemes or corymbs, rarely solitary. Flowers zygomorphic, yellow. Calyx campanulate, 5-merous, greenish-yellowish. Corolla with 5 petals, free, sometimes the banner with reddish tones. Stamens 10, free, of same or different size. Fruit oblong, linear-oblong, flattened, cylindrical or torulous and with constrictions between the interseminal spaces.

A genus of 11-12 species [4], from central USA, through Mexico, Venezuela, Ecuador to Argentina, also in Africa. In northeastern Mexico two species recorded, inhabiting tropical deciduous woods, semiarid and desert scrublands, and disturbed places.

1A.	Leaves, 15-40 cm long, subsessile or with a tiny petiole ending in a thorn; rachis of pinnae flattened; fruit torulous	***P. aculeata***
1B.	Leaves less than 15 cm long, petiole evident, cylindrical; fruit laterally flattened	2
2A.	Ovary and fruits glabrous	***P. texana*** ssp**.** ***macra***
2B.	Ovary and fruits pubescent	***P. texana*** ssp**.** ***texana***

Parkinsonia aculeata L., Sp. Pl. 1: 375. 1753. Basionym: *Parkinsonia thornberi* M.E. Jones, Contr. W. Bot. 12: 12. 1908.

Type: America (Lectotype: Stearn, Introd. Linnaeus' Sp. Pl. (Ray Soc. ed.): 47. 1957): [icon] "*Parkinsonia*" in Linnaeus, Hort. Cliff.: 157, t. 13. 1738.).

Shrub or tree, up to 9 m tall. Branches armed with semi-straight or slightly curved spines. Stipules spinescent short located at both sides of the spinescent rachis, deciduous or persistent. Leaves bipinnate (resembling two simple pinnate leaves). Pinnae 1 pair per leaf, each pinnae originating from a short rachis transformed into a spine, 15-40 cm long, leaf rachis flattened, narrow. Leaflets small, numerous, caducous. Inflorescences axillar, arranged in fasciculated racemes or solitary. Pedicels articulated. Flowers yellow. Calyx 5-merous, gamosepalous, oblique. Stamens with the filament thickened. Fruit 5-14 × 0.7-0.9 cm, flattened, linear to oblong, or cylindrical and constricted between seeds, longitudinally striated, late dehiscent.

Representative examined material: Coahuila: 3-X-2008, *J. Valdés 3129* (NSM), 12-V-2005, *J.A. Encina 3691* (ANSM).. Nuevo León: 20-VII-02, *C. Yen y E. Estrada 14969* (CFNL); 19-VII-02, *C. Yen y E. Estrada 14923* (CFNL); 13-IV-02, *C. Yen y E. Estrada 14526* (CFNL); 16-IV-01, *C. Yen y E. Estrada 12489*

 doi:10.20944/preprints202404.0408.v1

(CFNL). Tamaulipas: 13-IV-1962, *M. Domínguez M. 8280* (UAT); 20-XI-1987, *M. Martínez 1604* (UAT); 23-III-1993, *J.L. Mora-López 348* (UAT); 27-VI-1985, *M. Martínez 695* (UAT).

Comments: From south of USA, through Mexico, Caribbean region, Central America to South America. Frequent but not abundant in the lowlands, in the Tamaulipan thornscrub, piedmont scrub, and in desert scrublands, 290-1750 m. Widely used for manufacturing poles, charcoal, firewood and household goods. Popularly it is known as *retama*.

Parkinsonia texana (A. Gray) S. Watson ssp. ***macra*** (I.M. Johnst.) Isely, Mem. New York Bot. Gard. 25(2): 175. 1975. Basionym: *Cercidium macrum* I.M. Johnst., Contr. Gray Herb. 70: 64. 1924. *Cercidium texanum* A. Gray, Smithsonian Contr. Knowl. 3(5): 58. 1852. *Parkinsonia texana* (A. Gray) S. Watson, Proc. Amer. Acad. Arts 11: 136. 1876.

Type: Mexico, Nuevo León, Mesas near Monterrey, *C.G. Pringle 2537* (Holotype: GH53330!. Isotype: A53331!; CM0988!; KFTA72!).

Distinguishing features: Shrub or tree, up to 7 m tall, bark green, the branches flexuose, the nodes armed with small, straight, paired prickles. Leaves bipinnate. Pinnae 1-2 pairs per leaf. Leaflets 3-4 pairs per pinnae. Inflorescences axillar, arranged in short racemes. Flowers yellow. Sepals free. Corolla, with 5 subequal petals, basally unguiculate. Stamen filaments densely white-pubescent basally. Ovary glabrous. Fruit 5-8 × 1-1.5 cm, oblong, flattened, glabrous, green to yellowish brown.

Representative examined material: Coahuila: 28-IV-1987, *A. Rodríguez 818* (ANSM), 4-V-1989, *J.A. Villarreal 4841* (ANSM). Nuevo León: 5-VII-2001, *C. Yen y E. Estrada 12887* (CFNL); 5-VII-2001, *C. Yen y E. Estrada 12855* (CFNL). 7-VII-2001, *C. Yen y E. Estrada 12988* (CFNL). 16-V-2003, *E. Estrada 15649* (CFNL). Tamaulipas: 23-III-1999, *A. Mora-Olivo 7473*.

Comments: In Tamaulipan thornscrub, sandy soils 125-550 m. Out of the study area, distribued in southern Texas, and San Luis Potosí. It is used as tree shade for livestock. For its colorful and abundant flowering it is commonly used as ornamental. It is also appreciated for the good quality of charcoal provided by the firewood from its branches. Due to the hardness of its wood, it is used for the manufacture of tool handles, such as machetes, shovels and talaches. It is popularly known as *palo verde*.

Parkinsonia texana (A. Gray) S. Watson, Proc. Amer. Acad. Arts. 11: 136. 1876. ssp. ***texana*.** Basionym**:** *Cercidium texanum* A. Gray, Smithsonian Contr. Knowl. 3(5): 58. 1852.

Type: USA, New Mexico, Western Texas, EL Paso, *C. Wright 149* (Isotype: P3327362!).

Distinguishing features: Small shrub, up to 2 m tall, usually branched from the base. Branches in zigzag, ashy or light green, glabrous, armed with small, solitary, straight nodal spines. Pinnae 1-2 pairs per leaf. Leaflets 1-3 pairs per pinnae. Inflorescences axillar, arranged in short racemes. Flowers 2-5 per raceme. Corolla with subequal petals, the banner with reddish tones. Ovary densely pubescent. Fruit 3-6 × 0.8-1 cm, flattened, straight, acute apically, slightly pubescent, yellowish brown.

Representative examined material: Coahuila: 7-VII-2001, *J. Luna, M. González, C. Yen y E. Estrada 12988* (CFNL). Nuevo León: 5-VII-2001, *C. Yen y E. Estrada 12887* (CFNL); 5-VII-2001, *C. Yen y E. Estrada 12855* (CFNL); 16-V-2003, *C. Yen y E. Estrada 15649* (CFNL). Tamaulipas: 24-III-1985, M. Martínez 201 (UAT); 31-X-1984, B.D. Fuentes, R. Diaz, R. Aguilar 590 (UAT); 22-III-1985, M Yanez 31 (UAT).

Comments: In low plains places with open vegetation, Tamaulipan thornscrub, sandy and stony soils. Also in southern Texas. Easily differentiated of the **ssp.** *macra* by its lower size and pubescent ovary.

Pomaria Cav., Icon. 5(1): 1-2, pl. 402. 1799. *Melanosticta* DC., Prodr. 2: 484. 1825. *Cladotrichium* Vogel, Linnaea 11: 401. 1837.

Type: *Pomaria glandulosa* Cav., Icon. [Cavanilles] 5: 2, t. 402. 1799.

Herbaceous, subshrubs or shrubs, pubescent, stems and leaves with orange sessile (black when dry) glands and dendroid (multicellular projections consisting of a vertical axis with plumose projections radiating of the main axis or at the tip) or palmate (similar to the dendroid ones but projectioins radiating mainly at the tip). Pinnae 1-7 pairs per leaf, plus one terminal. Leaflets 2-10 pairs per pinnae, with sessile glands abaxially. Inflorescences axillar or terminal, arranged in racemes.

 doi:10.20944/preprints202404.0408.v1

Flowers zygomorphic, commonly yellow-light or bright-yellow. Calyx 5-merous, the sepals of different sizes, the lower one the largest, containing inside the stamens and pistil. Corolla of 5 petals, the innermost (banner), erect and upper, with trichomes and stipitate-glandular trichomes dorsally, the 2 adjacent lateral petals unguiculate, yellow, dyed red basally. Stamens 10, of different sizes, curved, contained inside of the lower sepal, the two dorsal filaments geniculate, villous. Fruit lanceolar-oblong, falcate lunate to trapezoidal, erect or reflexed, with fluffy to stellate pubescence in addition to glands, dehiscent, the valves coiling spirally.

Historically, the genera *Pomaria* (Cavanilles, 1799) and *Hoffmannseggia* (Cavanilles, 1798) began their periplous from 1840 within legume systematics, both genera being closely related to the genus *Caesalpinia* (Linneo, 1753). Authors such as Torrey and Gray (1840) have included *Pomaria* within *Hoffmannseggia*, or *Pomaria* have included it as a section of *Caeslapinia* (Bentham and Hooker, 1865), others such as Fisher (1892) transfer all the species of *Hoffmannseggia* to *Caesalpinia*, and even the species of *Caesalpinia* and *Hoffmannseggia* have been gathered together and treated as part of the genera *Larrea*, *Schrammia* and *Moparia* (Britton & Rose, 1930). By means of morphological characters and enzyme analysis (DNA restriction sites) provide evidence to differentiate the clade with species belonging to *Hoffmannseggia* from species of other groups such as *Pomaria, Erythrostemon, Guilandina, Poincianella Caesalpinia* among other related groups [69].

Genus with 16 species; nine in North America [4,70], seven in northern Mexico, four in South America and three in southern Africa [4]. The next key follows [70] with few modifications.

1A.	Fruits arched, its margins parallel, or moon-shaped, basally broadened, or the fruits ovate with multicellular projections consisting of a vertical axis with trichomes radiating mainly at the tip	2
1B.	Fruits trapezoid or lanceolar-oblong in profile, with abundant cylindrical setose projections, 1-2 mm long or with multicellular projections with a short axis with a few radial, apical trichomes of different sizes	4
2A.	Fruit arched, its margins more or less parallel; valves densely covered with trichomes, glandular-punctate	***P. canescens***
2B.	Fruit lunate, with its dorsal margin slightly curved and the lower margin strongly inclined outwards; valves with multicellular projections ending in a variable number of palmate trichomes	3
3A.	Stems angularly branched, slightly pilose; fruits 18-21 mm long, their valves and margins with few multicellular projections, each one presenting few terminal trichomes	***P. fruticosa***
3B.	Stems straight or basally decumbent, hirsute, with short, coiled pilose trichomes; fruits 20-25 mm long with scattered glandular-punctate trichomes and numerous multicellular projections with abundant star-shaped apical trichomes	***P. jamesii***
4A.	Sepals with long glandular-punctate trichomes turning black on drying, mixed with smaller peltate red or orange trichomes; fruit margins with multicellular projections up to 1 mm long	***P. melanosticta***
4B.	Sepals with long glandular-punctate trichomes, turning black when dry, without the presence of other types of trichomes; fruit margins without multicellular projections or only with few projections 0.5-2 mm long	5
5A.	Fruits with multicellular projections 0.5-2 mm long	***P. wootonii***
5B.	Fruit with few short multicellular projections, 0.5 mm long	***P. austrotexana***

 doi:10.20944/preprints202404.0408.v1

Pomaria austrotexana B.B. Simpson. Lundellia 1: 51. 1998.

Type: USA, Texas, Jim Hogg Co., Farm Rd 649, 11 mi N of Guerra, 23-III-1962, *S. Alvarez 7765. P. Guajardo, J. Salazar, W.L. MaCart.* (Holotype: LL31188!. Isotype: TEX296642!).

Distinguishing features: Subshrub, up to 0.6 m tall. Stems dense pubescent and glandular punctate with scattered glands, glabrous and red with age. Pinnae 2-3 pairs plus one terminal per leaf. Leaflets 3-5 pairs per pinnae, pubescent and glandular punctate. Inflorescences terminal, arranged in racemes. Flowers with the lower sepal the longest, all sepals pubescent and with glands. Banner dyed red with glands dorsally, lateral petals glabrous or almost so or with few trichomes basally in the dorse. Stamens with pubescent filaments in the lower half. Fruit 2-3 × 1 cm, apically acute, glandular punctate and also with short, 0.5 mm long or less dendroid or palmate trichomes.

Representative examined material: Tamaulipas: 25-IX-1981, *P.A. Fryxell 3724* (MEXU).

Comments: Endemic of the southern Texas and northeastern Mexico. Rare in Mexico, only recorded at the northern end of Tamaulipas. *P. wootonii* is very similar to *P. austrotexana*, but the latter has longer (0.5-2 mm) dendroid or palmate trichomes on the pods.

Pomaria canescens (Fisher) B.B. Simpson, Lundellia 1: 56. 1998. Basionym: *Caesalpinia canescens* (Fisher) Fisher, Bot. Gaz. 18: 123. 1893. *Hoffmannseggia canescens* Fisher, Contr. U.S. Natl. Herb. 1(5): 149. 1892. *Larrea canescens* (Fisher) Britton, N. Amer. Fl. 23(5): 316. 1930.

Type: Mexico, Coahila, Saltillo, II-1880, *E. Palmer 269* (Holotype: US2573!. Isotype: K118876!; NY431783!).

Distinguishing features: Subshrub up to 1 m tall, basally branched. Stems canescent to tomentose plus trichomes retrorse and glandular. Pinnae 2-4 pairs plus one terminal per leaf. Leaflets 4-7 pairs per pinnae, pubescent adaxially and abaxially, abundant glandular trichomes. Inflorescences axillar or terminal, arranged in racemes. Flowers yellow, occasionally dyed red. Sepals of different sizes, the lower one tomentose and with glandular trichomes. Banner with red dots, with trichomes inside and near the base and glandular trichomes dorsally, lateral petals glabrous, or with few glandular trichomes dorsally. Fruit 2-2.6 × 0.5 cm, arched, its margins parallel, with abundant both, glandular and dendroid trichomes branched apically.

Representative examined material: Nuevo León: 21-VI-2003, *C. Yen y E. Estrada 15780* (CFNL), 21-VI-2003, *C. Yen y E. Estrada 15796* (CFNL); 22-III-2003, *C. Yen y E. Estrada 15347* (CFNL); 8-VI-2003, *C. Yen y E. Estrada 15749* (CFNL). Tamaulipas: 22-VII-1970, *T Whiffin, J.KL: Grashoff 334* (95579LL).

Comments: Endemic to north of Mexico. In northeastern Mexico, in low plains (Tamaulipas and Nuevo León), associated with Tamaulipas thornscrub, 350-450 m, and high plains of Coahuila (1440-1700 m) in desert scrublands. Outside of the area, also in Chihuahua, Durango, Zacatecas and San Luis Potosí.

Pomaria fruticosa (S. Watson) B.B. Simpson, Lundellia 1: 57. 1998. Basionym: *Hoffmannseggia fruticosa* S. Watson, Proc. Amer. Acad. Arts 21: 451. 1886. *Caesalpinia fruticosa* (S. Watson) Fisher, Bot. Gaz. 18: 123. 1893. *Larrea fruticosa* (S. Watson) Britton, N. Amer. Fl. 23(5): 314. 1930.

Type: Mexico, Coahuila, Mountains Jimulco, *C.G. Pringle 230* (Isotype: GH62315!; US588509!; SI2033!).

Distinguishing features: Dwarf shrub, up to 1.3 m tall, forming an irregular but angular branching pattern. Stems pubescent when young, turning red with age. Pinnae 1-3 pairs per leaf plus one terminal. Leaflets 2-5 pairs per pinnae, densely pubescent adaxially, similar pubescence abaxially and with few punctate glands. Inflorescences terminal, arranged in racemes. Sepals tomentose and glandular dorsally. The banner commonly dyed red, pubescent internally, glandular dorsally, lateral petals pubescent internally. Fruits 18-21 mm long, dorsally lunate, ventrally straight, pilose and glandular trichomes and very few and tiny (0.3 mm long) palmate trichomes with few multicellular projections, each one presenting few terminal trichomes.

Representative examined material: Coahuila: 21-VI-2007, *E. Estrada 20097* (CFNL; TEX); 25-VIII-1988, *J.A. Villarreal 4439, M.A. Carranza* (ANSM, TEX); 25-VIII-1988, *J.A. 7812 M.A. Carranza* (ANSM, TEX); 24-IX-1972, *M.C. Johnston 9504* (ANSM); 23-III-1973, *M.C. Johnston et al.,* (TEX).

 doi:10.20944/preprints202404.0408.v1

Comments: Endemic to north of Mexico. Recorded only for high plains in Coahuila and Durango, 1200-2100 m, in desert scrublands, rocky soils. Easily recognized due to its angular branching pattern.

Pomaria jamessii (Torr. & A. Gray) Walp., Repert Bot. Syst. 1: 811. 1843. Basionym: *Hoffmannseggia jamesii* Torr. & A. Gray, Fl. N. Amer. 1: 393. 1840. *Caesalpinia jamesii* (Torr. & A. Gray) Fisher, Bot. Gaz. 18: 13. 1893. *Larrea jamesii* (Torr. & A. Gray) Britton, N. Amer. Fl. 23(5): 316. 1930.

Type: USA, New Mexico, Sources of the Canadian, *E. James s.n.* (Holotype: NY431802!, designed by Simpson, 1998. Isotype: GH3052!).

Distinguishing features: Herbaceous, perennial, up to 0.5 m tall, suberect to decumbent, hirsute, with coiled pubescence. Pinnae 2-3 pairs plus one per leaf. Leaflets 5-10 pairs per pinnae, sparsely pubescent adaxially, densely so with curled trichomes and glandular punctate abaxially. Inflorescences lateral and terminal, arranged in racemes. Sepals with short curled hairs on tips and their margins glandular punctate. Petals yellow, red dyed, pubescent basally inside, glandular punctate dorsal and basally. Stamens pubescent. Fruit 2-2.5 × 1 cm, sparsely with glandular-punctate trichomes and stellate-palmate trichomes.

Representative examined material: Coahuila: 27-VII-1938 E.G. *Marsh s.n.* (TEX).

Comments: Southern USA and north of Mexico, in northeastern Mexico, recorded only in the extreme north of the state of Coahuila, in desert scrublands.

Pomaria melanosticta S. Schauer, Linnaea 20(6): 748-749. 1847. Basionym: *Hoffmannseggia melanosticta* (S. Schauer) A. Gray, Pl. Wright. 1: 54. 1852. *Larrea melanosticta* (S. Schauer) Britton N. Amer. Fl. 25(3): 314. 1930. *Caesalpinia melanosticta* (S. Schauer) Fisher, Bot. Gaz. 18: 123. 1893. *Hoffmannseggia parryi* (Fisher) B.L. Turner. *Caesalpinia parryi* (Fisher) Eifert, in D.S. Correll & M.C. Johnston, Manual of the vascular plants of Texas 797. 1970. *Hoffmannseggia melanosticta* var. *parryi* (Fisher) Fisher, Contr. U.S. Natl. Herb. 1: 149. 1982. *Larrea parryi* (Fisher) B.L. Turner, Field & Lab. 18: 47. 1950. *Hoffmannseggia melanosticta* var. *greggii* Fisher, Contr. U.S. Natl. Herb. 1: 149. 1892. *Caesalpinia melanosticta* var. *greggii* (Fisher) Fisher, Bot. Gaz. 18: 123. 1893.

Type: Mexico, Azu[fe]ora, 1846-1849, *J. Gregg 497* (Isotype: MO-176048!).

Distinguishing features: Subshrub up to cm 0.6 m tall, with a stinky aroma when fresh. Stems canescent and glandular. Pinnae 1-2 pairs plus one terminal per leaf. Leaflets 2-4 pairs per pinna, sparsely pubescent adaxially, densely villous abaxially and also with glandular trichomes. Inflorescences terminal, arranged in racemes. Flowers yellow, red dyed. Sepals pubescent and glandular punctate of 2 types, ones flattened glandular, black (dried), the others ones stipitate, red or orange. The banner red dyed, villous inside, glabrous or glandular dorsally, lateral petals glabrous or villous abaxially and basally. Fruit 2-3.2 × 1-1.5 cm, oblique-oblong, distally curved, with scattered glandular trichomes and densely covered with red, multicellular, dendroid palmate trichomes, up to 2 mm long.

Representative examined material: Nuevo León: 22-VII-1971, *H.M. Parker 532* (TEX-LL); 16-III-1973, *M.C. Johnston, T.L. Wendt y F. Chiang 10228b* (TEX-LL). Tamaulipas: 7-XII-1993, *A. Mora-Olivo 5041* (UAT); 10-VII-1987, *L. Hernández 2153* (UAT).

Comments: Southwestern Texas, Chihuahua, Coahuila and Nuevo León to Zacatecas, San Luis Potosí, Querétaro to Hidalgo. Lowlands and highlands, calcareous and gypsum soils, desert shrublands and halophytic grasslands, 650-1800 m.

Pomaria wootonii (Britton) B.B. Simpson, Lundellia 1: 69. 1998. Basionym: *Caesalpinia wootonii* (Britton) Eifert ex Isely, Mem. New York Bot. Gard. 25(2): 51. 1975. *Larrea wootonii* Britton, N. Amer. Fl. 23(5): 315. 1930.

Type: Mexico, Tamaulipas, Chamal, 25-VI-1919, *E.O. Wooton s.n.* (Isotype: US2597!).

Distinguishing features: Subshrub up to 60 cm tall. Stems tomentose and glandular punctate. Pinnae 2-3 pairs plus one terminal per leaf. Leaflets 4-5 pairs per pinnae, sparsely pubescent adaxially, glandular punctate and short coiled trichomes abaxially, mainly in veins and margins. Inflorescences axillar and terminal, arranged in racemes. Sepals short wooly on the margins, sparsely pubescent at the base and scatter glandular punctate. Banner internally villous basally or wooly and with glandular trichomes dorsally. Filaments villous. Fruit 2 × 0.8 cm, oblong, acute apically, with scattered

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glandular punctate trichomes and few dendroid trichomes, fruit margin pronounced, without multicellular projections, or if present, scarce and less than 0.5 mm long.

Representative examined material: Coahuila: 16-IV-1979, *J. Marroquín 3656* (ANSM), 14-VI-1987, *D. Castillo 577* (ANSM). Nuevo León: 16-V-2003, *C. Yen y E. Estrada 15653* (CFNL); 22-X-2002, *C. Yen y E. Estrada 15163* (CFNL, MEXU); 7-IX-1962, *B.L. Turner 1042 and A.M. Powell* (TEX-LL). Tamaulipas: 23-III-1999, *A. Mora-Olivo 7475* (UAT); 12-XI-1959, *J. Graham and M.C. Johnston 4655* (TEX-LL); 8-XII-1960, *M.C. Johnston 6073 and C. McMillan* (TEX-LL).

Comments: Endemic to northeastern Mexico. Common in the low plains, calcareous and rocky soils, in Tamaulipan thornscrub, piedmont scrub, and desert scrublands with scarce vegetation and low cover, also in areas with disturbance, 250-750 m.

Tribe Cassieae Bronn emend. H.S. Irwin & Barneby, New York Bot. Gard. 35: 1. 1982.

Herbaceous, shrubs or trees. Leaves pinnate, paripinnate. Leaflets opposite. Inflorescences mainly arranged in racemes, rarely cualiflorous, rarely 1-2 flowers. Bractlets 0-2. Flowers hermaphrodite, zygomorphic, yellow. Sepals 5, imbricate. Petls 5, the banner (vexillar petal) almost always interior in bud. Stamens 2-10, when 10, all of them fertile or three adaxial ones staminodes. Anthers dehicent by subterminal pores or slits, sometimes basally dehiscents. Fruit cylindrical, angulate or flattened, sometimes winged, dehiscent along one or both sutures, inertly or alastically dehiscent, or indehiscent, seeds 1-many.

The tribe Cassieae [16] was made up of 5 subtribes: Dialiinae, Duparqeutiinae, Cassinae, Labicheinae and Ceratoniinae, however, the new classification of Legumes [1], elevates the subtribe Dialiinae to the rank of subfamily (Dialioideae) where the subtribe Labicheinae is included within it. The subtribe Duparquetiinae is also elevated to the rank of subfamily (Duparquetioideae), while the subtribe Ceratoniinae is transferred to the Subfamily Caesalpinioideae. In these circumstances the Tribe Cassieae, is made up of three genera (*Cassia*, *Chamaecrista* and *Senna*).

1A.	Filaments of 3 stamens sigmoid, several times larger than their anthers, the remaining 7 filaments straight and shorter; pedicels 2-bracteolate at or just above base; fruit indehiscent	***Cassia***
1B.	Filaments of all stamens straight or curved, shorter or less than 2 times the length of their anthers; pedicels ebracteate or 2-bracteate, the bracteoles inserted in the middle portion or distally; fruit dehiscent or indehiscent	3
2A.	Flowers without staminodes; pedicels with 2 bracteoles; fruit explosively dehiscent, valves coiling or twisting after dehiscence	***Chamaecrista***
2B.	Flowers with staminodes; pedicels without bracteoles; fruit dehiscent or indehiscent (non-explosively) through one or both sutures	***Senna***

Cassia [Tourn.] L., Sp. Pl. 376. 1753. *Cathatocarpous* Pers., Syn. pl. 1: 459. 1805. *Bactyrilobium* Willd. Enum. hort. berol. 439. 1809. *Cassia* sect. *Fistula* DC ex. Colladon, L., Hist. Cass. 83.1809. *Cassia* sensu Link, Handbruch 2: 138. 1831. *Cassia* sensu Irwin & Barneby in Polhill & Raven. 1981. P. 105.

Type species: *Cassia fistula* L. Sp. Pl. 1: 377. 1753.

Trees or shrubs. Leaves paripinnate. Leaflets, small or large, up to 25 pairs. Inflorescences arranged in terminal or axillary racemes. Pedicles laterally compressed, with one pair of deciduous or persistent bracteoles at or near the base. Flowers yellow (northeastern Mexico). Calyx 5-merous. Sepals graduated, reflexed at anthesis, deciduous. Corolla zygomorphic, dialypetalous, the banner of a different color than the rest of the petals. Petals unguiculate or not, similar in shape, or the banner differentiated by its crenulate margin or callosities at the base or by lateral appendages on the claw. Stamens 10, heteromorphic, three of them with their filaments proximally sigmoid and distally curved, frequently dilated in the external or distal curvature, the remaining seven stamens smaller, without sigmoid filaments, six of these, fertile and the remaining one a staminode. Ovary stipitate,

 doi:10.20944/preprints202404.0408.v1

linear, curved. Fruit indehiscent, pendulous, linear, cylindrical or laterally compressed, woody, internally septate.

Genus of 30 species, circumtropical. In America 13 species, most of them in the Amazon region (12), one species endemic to Mexico [4], the rest in Africa, Madagascar, Thailand, India, Myanmar, and Australia.

Of the three genera within this tribe, *Cassia* is the only one where the filaments of three of its 10 stamens are sigmoidally curved, the other two genera have stamens with straight filaments. In northeastern Mexico only one species, *C. fistula*.

Cassia fistula L., Sp. Pl. 1: 377-378. 1753. Basionym: *Bactyrilobium fistula* (L.) Willd., Enum. Pl. [Willdenow] 1: 440. 1809. *Cassia fistuloides* Collad., Hist. Nat. Méd. Casses 87, t. 1816. *Cathartocarpus fistula* (L.) Pers., Syn. Pl. [Persoon] 1: 459. 1805.

Type: Sri Lanka, *P. Herman s.n.* (Lectoholotype: BM621869!).

How to recognize: Tree up to 8 m tall. Leaves 15-62 cm long. Leaflets 2-7 pairs per leaf, distally accrescent, ovate, bicolored. Inflorescence arranged in pendulous racemes. Sepals soon reflexed, subequal, the internal ones obovate or oblong-elliptical. Petals subequal or the banner short, the abaxial petals long. Three stamens with long sigmoid filaments. Fruit long persistent on the tree, 30-60 × 1.5-2.5 cm, cylindrical, straight, black, glabrous, internally septate. Seeds transversely arranged.

Representative examined material: Nuevo León: 20-V-2003, *C. Yen y E. Estrada 15658* (CFNL). Tamaulipas: 3-I-2024, *A. Mora-Olivo s.n.* (UAT)

Comments: Species native to India, today widely cultivated in many countries. In northeastern Mexico it is commonly used as ornamental species in public and private gardens. A splendorous species due to its showy foliage and spectacular flowering and long pendulous fruits. Due to the showy and colorful nature of its abundant flowers, it is popularly known as “lluvia de oro” (golden rain).

Chamaecrista [Breyne] Moench, Meth. Pl. hort. Bot. Marburg. 272. 1794. *Cassia* sect. *Absus* DC. ex Collad., Hist. Nat. Méd. Casses: 116. 1816. *Cassia* sect. *Lasiorhegma* Vogel, Syn. Gen. Cas. 8. 1837. *Cassia* subgen. *Absus* (DC. ex Collad.) Symon, Trans. et Proc. Roy. Soc. South Australia 90: 77. 1966.

Type: *Chamaecrista nictitans* (L.) Moench, pl. hort. bot. Marburg. 272. 1794.

Herbaceous, shrubs or trees, unarmed. Leaves alternate, pinnate. Leaflets opposite. Leaf glands present or absent. Inflorescences arranged in axillar or subterminal racemes, 1-multiflorous. Pedicels bibracteolate, near or above the middle. Flowers yellow. Calyx dialysepalous. Sepals 5, imbricate. Corolla dialypetalous. Petals 5, sometimes tinged with reddish, sub-equal. Stamens 2-10, isomorphic or heteromorphic. Anthers basifixed, longer than the filament, thecae ciliolate along sutures, opening apically by pores or by small longitudinal slits. Fruit compressed, papyraceous or leathery, the valves curling in on themselves as they separate from each other.

Genus of 330 species in tropical and subtropical areas; Most of the species (266) in America, with greater diversification in South America [4], 36 in Africa and 12 native to Australia.

Easily differentiated from *Senna*, since no species of *Chamaecrista* presents staminodes in its flowers.

1A.	Leaflets 1 pair per leaf	***Ch. diphylla***
1B.	Leaflets 2-more pairs per leaf	2
2A.	Sepals obtuse; flower buds subglobose to broadly obtuse-ovoid	3
2B.	Sepals acute or acuminate; flower buds ovoid-acuminate or acute	4
3A.	Leaflets 3-6 pairs, 5-11 mm largo	***Ch. greggii*** ssp. ***greggii***
3B.	Leaflets 2 pairs, rarely 4 pairs, 11-17 mm long	***Ch. greggii*** ssp. ***potosina***
4A.	Peduncles axillar	***Ch. flexuosa*** ssp. ***texana***

 doi:10.20944/preprints202404.0408.v1

4B.	Peduncles appearing supra-axillary, attached to stem internode 0.5-1 mm or more from point of origin	5
5A.	Petals 3.5-6.5 mm long	***Ch. nictitans* ssp. *disadena*** ssp. ***pilosa***
5B.	Petals 8-19 mm long	6
6A.	Stipules 7-17 mm long; leaves 3-12 cm long; leaflets 14-45 pares	***Ch. rufa*** ssp. ***rufa***
6B.	Stipules 2-7 mm long; leaves 1.5-4 cm long; leaflets 10-19 pairs	7
7A.	Perennial plants	***Ch. chamaecristoides*** ssp. ***chamaecristoides***
7B.	Annual plants	***Ch. chamaecristoides*** ssp. ***cruziana***

Chamaecrista chamaecristoides (Colladon) Greene ssp**.** ***chamaecristoides***, Basionym: *Cassia chamaecristoides* Colladon, 1816, 1.c. sense strict. Mill. Dict. 17. *Cassia chamaecrista* Mill., Gard. Dict. Ed. 8. 1768 (non Linneus, 1753). *Cassia cinerea* Cham. & Schltdl.

Type: Mexico, *Schlechtendal 711* (Isotype: K478547!). Isotype: Mexico, Veracruz, inter Tecolutla et Villarica, I-1829, *C.J.W. Schiede and F. Deppe s.n.* (BM952119!).

Distinguishing features: Herbaceous, perennial, psammophilous. Stems diffuse, decumbent, up to 2 m long, pubescent with ascending hairs. Foliar gland arising at the middle of the petiole. Leaflets 10-19 pairs per leaf. Inflorescences supra axillar, attached to stem internode almost 1 mm from the point of origin, arranged in racemes. Sepals yellowish to brownish. Petals of different sizes, three shorter, the banner flabellate, and one oblong-cucullate as long as the banner. Stamens 10, anthers red. Fruit 2.5-6.5 × 0.5-0.6 cm, brown to black.

Representative examined material: Tamaulipas: 10-VI-1997, *A. Mora-Olivo 7287* (UAT); 23-V-1985, *B.D. Aguilar 761* (UAT); 3-X-1984, *D. Baro 489* (UAT); 29-I-1923 to 17-X-1923, *C.D. Mell s.n.* (NY 554138!); 31-I-1975 to 11-XI-1975, *A.A. Lasseigne 4986* (NY554155!); 11-I-1898 to 24-VIII-1898, *C.G. Pringle 6805* (554140!); 1/8-II-1910, *E. Palmer 254* (NY554139!).

Comments: Endemic to Mexico, Gulf Coast (Jalisco and Michoacán) and Pacific Coast, from Tamaulipas, Veracruz, Tabasco to Campeche.

Chamaecrista chamaecristoides* var. *cruziana (Britton & Rose) H.S. Irwin & Barneby, Mem. New York Bot. Gard. 35(2): 773. 1982. Basionym: *Chamaecrita cruziana* Britton & Rose, N. Amer. Fl. 23(5): 288. 1930.

Type*:* Mexico, Veracruz, Pueblo Viejo, 2 km S of Tampico, *E. Palmer 534* (Holotype: NY4044!. Isotype: MO-126298!; CAS1992!; US00002127!; G371035!).

Distinguishing features: Very similar to the ssp**.** *chamaecristoides*, but this variety has an annual growth habit and narrower fruits (0.4-0.5 cm).

Representative examined material: Tamaulipas: 7-V-1984, *D. Baro 144* (UAT), Tamaulipas-Veracruz border: 1/2-VI-1910, *E. Palmer 534* (MO-126298!).

Comments: Recorded only in the state of Tamaulipas, in coastal dunes, sandy soils, forming patches. Also in coasts of Texas, and Veracruz, adjacent to Tamaulipas (Pánuco city).

Chamaecrista diphylla (L.) Greene, Pittonia 4: 28. 1899. Basionym: *Cassia diphylla* L., Sp. Pl. 376. 1753.

Type: Country unknown, collector anon s.n. (Lectotype: LINN-HL528-1).

Distinguishing features: Monocarpic or short lived perennial. Stems 15-100 cm long, simple or branched, raditing from a root-crown or erect. Stipules as long or little shorter than internodes. Leaflets 1 pair per leaf, 1-4 x 0.3-2 cm, obovate to oblnaceolate, linear or linear-elliptic. Fruit 2.5-5.2 x 0.4-0.7 cm.

Representative examined material: Tamaulipas: 14-XI-1998, *A. Mora-Olivo 2023* (UAT)**.**

 doi:10.20944/preprints202404.0408.v1

Comments: In the study area, recorded only in the state of Tamaulipas, is the only species of *Chamaecrista* with only 1 pair of leaflets in northeastern Mexico. Reported from south-eastern Mexico (Veracruz to Tabasco) to Chiapas and Oaxaca, Central America, from Colombia to Brazil.

Chamaecrista flexuosa* ssp. *texana (Buckl.) H.S. Irwin & Barneby, Mem. New York Bot. Gard. 35(2): 700. 1982. Basionym: *Cassia texana* Buckl., Proc. Acad. Nat. Sci. Philad. 1861: 452. 1861. *Chamaecrista texana* (Buckl.) Pennell. Bull. Torr. Club 44: 344. 1917.

Type: USA, Texas, Bastrop County, non date, *S.B. Buckley s.n.* (PH00001286!)

Distinguishing features: Suffruticose or perennial herb. Stems quadrangular in first stages, humifuse, up to 0.5 m long, pubescence of curved hairs 0.5 mm long, mixed with septate setae up to 1 mm long. Leaflets 9-25 pairs per leaf. Petiolar gland sessile or stalked. Inflorescences axillar, arranged in racemes. Sepals red to brown. Petals 5, 4 similar, obovate and unguiculated, the other one, a monk's hood (cowl, cucullus) petal, as long but wider and enclosing the gynoecium, bright yellow. Stamens 10, the adaxial pair of the larger ones, incurved connivent (touching each other without being fused), the three abaxial ones straight or almost so, the inner ones, the smaller and sometimes infertile. Fruit 2.5-7 × 0.5 cm, oblong, ascending.

Representative examined material: Tamaulipas: 15-IV-1999, *A. Mora-Olivo 7526* (UAT); 1915, *Buckl. & Pennel? 2427* (NY); *R.L. Crocket 6487* (Laredo Texas, border county with Laredo, Tamaulipas Mexico (NY).

Comments: Recorded only in the state of Tamaulipas, in coastal plains, sometimes in disturbed places, 0-300 m. From south Texas through Tamaulipas to Yucatán in the Gulf Coast, also in the Pacific Coast (Colima to Guerrero).

Chamaecrista greggii (A. Gray) Pollard **ex.** A. Heller ssp**. *greggii.*** Basionym**:** *Cassia greggii* A. Gray Smithsonian Contr. Knowl. 3(5): 59. 1852.

Type: Mexico, Nuevo Leon, Monterrey and E of Corralbo [Cerralvo], W of Rinconada, 25/28-V-1847, *J. Gregg, s.n.* (Isotype: NY3634!; GH53022!).

Distinguishing features: Shrub, erect, unarmed up to 1.9 m tall. Stems, intricate. Foliar gland short stipitate, , sometimes adjacent to the insertion of the proximal pair of leaflets, rarely with additional glands on the distal part of the rachis. Leaflets 2-6 pairs per leaf. Inflorescence axillar, reduced to a solitary flower. Bracts 2 on the proximal portion of the pedicel. Petals, yellow-orange, obovate. Fruit 2-5 × 0.5-0.7 cm, oblong, flattened, reddish brown, elastically dehiscent.

Representative examined material: Coahuila: 11-IX-1997, *M.A. Carranza 2741* (ANSM), 27-XI-2001. *M.A. Carranza 3571* (ANSM).. Nuevo León: 7-VII-2001, *C. Yen y E. Estrada 12989* (CFNL); *J.A. Villarreal* et al. *9140* (ANSM, MEXU). 23-VII-1999, *E. Estrada* et al. *11245* (CFNL); 15-IX-2001, *C. Yen y E. Estrada 11721* (CFNL). 24-VI-2001, *C. Yen y E. Estrada 12827* (CFNL); 5-VII-2001, *C. Yen y E. Estrada 12847* (CFNL); 9-XI-1993, *Hinton* et al. *23872* (MEXU). Tamaulipas: 23-III-1999, *A. Mora-Olivo 7468* (UAT); 27-Vi-1985, *M. Martínez 676* (UAT); 25-XI-1984, *L. Hernández 1256* (UAT).

Comments: Endemic to northeastern Mexico and southern Texas. In lowlands (350 m) in Tamaulipas and Nuevo León associated to Tamaulipan thornscrub to highlands (1500 m) in Coahuila and Nuevo León associated to desert scrub.

Chamaecrista greggii (A. Gray) Pollard **ex.** A. Heller var**. *potosina*** (Britton & Rose) Irwin & Barneby, Phytologia 44(7): 500. 1979. *Chamaecrista potosina* Britton & Rose, N. Amer. Fl. 23(5): 283. 1930. *Cassia potosina* (Britton & Rose) Standl.. Field Mus. Bot. 22: 78. 1940.

Type: Mexico, XI-1910, Minas de San Rafael [San Luis Potosí], *C.A. Purpus 4832* (Holotype: NY4119!. Isotype: F57725F!; GH53356!; MEXU273597!).

Distinguishing features: Shrub, erect, unarmed up to 1.5 m tall, very similar to ssp. *greggii*, but the ssp. *potosina* always only (1-2) pairs of leaflets per leaf, rarely up to 4 pairs, if so, the leaflets longer, 1.1-1.7 cm long.

Representative examined material: Tamaulipas: 7-VII-1985, *P. Hiriart 910* (UAT); 29-VI-1985, *L. Hernández 1498* (UAT); 22-X-1999, *A. Mora-Olivo 7717* (UAT); 12-VIII-1941, *L.R. Stanford 871* (554253NY!).

Comments: Endemic to northeastern Mexico. Recorded only in the south of the state of Tamaulipas, desert scrublands, 1600-2400 m. Out of the area it distributes also in San Luis Potosí.

 doi:10.20944/preprints202404.0408.v1

Chamaecrista nictitans* ssp. *disadena* ssp. *pilosa Irwin & Barneby, Mem. New York Bot. Gard. 35(2). 829. 1982. Basionym: *Chamaecrista riparia* var. *pilosa* Benth. in Martis Fl. Bras. 15(2): 174. 1870. *Cassia propinqua* Kunth, Nov. Gen. & Sp. 6: 369. 1824. *Chamaecrita rekoi* Britton & Rose, N. Amer. Fl. 23(5): 289. 1930. *Chamaecrista tonduzii* Britton & Rose, N. Amer. Fl. 23(5): 290. 1930. *Chamaecrista fenixensis* Britton & Rose, N. Amer. Fl. 23(5): 291. 1930. *Chamaecrista comayaguana* Britton & Rose, N. Amer. Fl. 23(5): 291. 1930. *Chamaecrista conzatii* Britton & Rose, N. Amer. Fl. 23(5): 293. 1930. *Chamaecrista salvadorensis* Briton ex Britton & Rose, N. Amer. Fl. 23(5): 293. 1930. *Chamaecrista stenocarpoides* Britton ex Britton & Rose, N. Amer. Fl. 23(5): 293. 1930.

Type: Brazil, Mina Gerais; Lagoa Santa**,** 26-II-1866, *Warming 207* (NY3893!).

Distinguishing features: Annual or suffrutescent. Stems erect or decumbent and ascending, up to 2 m tall, pubescent with incurved trichomes and fine setae. Petiolar gland concave or stipitate. Leaflets 12-29 pairs per leaf, the margins ciliolate or with setae up to 1 mm long. Inflorescences axillar, 1-3 flowers. Flowers yellow. Petals similar in size, little graduated, forming a campanulate perianth, one of them, the longer one, cucullate, three longer than the rest. Fruit 2.5-7 × 2.5-4.5 cm, linear, purplish, brown or black, with pilose incurved pubescence.

Representative examined material: Tamaulipas: 22-V-1985, *B.D. Aguilar 744* (UAT); 25-VI-1984, *B.D. a<Aguilar 339* (UAT); 14-VI-1994, *J.L. Mora-López 529* (UAT); 23-IX-1985, *M. Yanez 462* (UAT); 23-VIII-2008, *A. Mora-Olivo 11731* (UAT); 31-VIII-1957, *H.S. Irwin 1392* (TEX97336!); 22-IX-1985, *M. Yáñes 462* (TEX973381!).

Comments: In northeastern Mexico, recorded only in the state of Tamaulipas. Widely distributed, from northeastern Mexico, through Central America, West Indies to Bolivia and Brazil.

Chamaecrista rufa (M. Martens & Galeotti) Britton & Rose ssp. ***rufa*.** Basionym: *Cassia rufa* M. Martens & Galeotti**,** Bull. Acad. Roy. Sci. Brux. 10(2): 306. 1843. *Chamaecrista jalapensis* Britton ex Britton & Rose, N. Amer. Fl. 23(5): 274. 1930. *Cassia chamaecrsita* sensu Sessé & Moc., Fl. Mex. Ed 2. 99. 1894.

Type: Mexico, Mirador, *H. Galeotti 3311* (Isotype: LE00002383!; US00001688!; G00371019!; P00836030!).

Distinguishing features: Subshrub to frutescent, up to 1.8 m tall. Stems and leaves with two types of pubescence, one of short incurved trichomes and the other of setae. Stipules erect, up to 1.7 cm long. Leaflets 18-32 pairs per leaf. Leaf glands 1-2, sessile or stipitate, arising near the middle of the petiole. Inflorescences axillar, arranged solitary or short racemes. Longer sepals 8-13.5 mm long. Abaxial petal (the longest one) 1-1.9 cm long. Fruit 3-6 × 0.4-0.5 cm, linear, curved, puberulent.

Representative examined material: Tamaulipas: 1932, *H.W. von Rozynski 599* (554440NY!).

Comments: Recorded only in the state of Tamaulipas, rare, in oak to oak-pine forest, and roadside, 1500 m. Out of the area, distributed from Veracruz to Chiapas and Guatemala, Honduras and Costa Rica.

Senna Mill., Gard. Dict., Abr. (ed. 4), 3. 1754. *Cassia* sect. *Senna* sensu Benth., in Benth. et Hooker, Gen. Pl. 1: 139. 1865. *Cassia* sect. *Senna* [Tournefort] DC. ex Colladon, Hist. Casses 92. 1816. *Cassia* subgen. *Senna* Bent. in Martius Fl. Bras. 15(2): 96. 1870. *Senna* sensu Gaertner, Fruct. sem. pl. 2: 312 t. 146. 1794. *Senna* sensu Link, Handbuch 2: 139. 1831. *Senna* sensu Roxburgh, Fl. Ind. ed Carey, 2: 339. 1832.

Type: *Senna alexandrina* Mill., Gard. Dict., ed. 8. n. 1. 1768.

Herbaceous or shrubs, unarmed. Leaves pinnate, often paired, Leaflets 1-numerous. Glands on the petiole and/or on the rachis of the leaf. Inflorescences axillar, arranged in racemes or panicles. Pedicels without bracteoles. Flowers yellow. Calyx 5-merous, the sepals free, imbricated. Corolla zygomorphic, petals 5, obovate, spatulate, acute at the base, Stamens 10 unequal, 7 fertile, staminodes mostly 3, anthers fertile, basifixed and heteromorphic, opening by pores or longitudinal sutures, thecae glabrous or pubescent, but not ciliated along and between the 2 thecae. Fruit dehiscent or indehiscent, flattened, turgid, flat compressed, angled, cylindrical, sometimes the body with longitudinally winged ridges, pulpy or transversely arranged.

Genus of 295-300 species [4,16]; almost all species distributed in America, several species in tropical regions of Africa and Australia [4] and Asia and Oceania [16].

 doi:10.20944/preprints202404.0408.v1

Easily differentiated from *Chamaecrista*, all *Senna* species have staminodes in their flowers. In northeastern Mexico we recorded 21 species.

1A.	Flowers strongly asymmetrical, one petal abaxial, opposite the pistil displaced, not centric, modified in shape (obliquely-dilated) and texture, its claw commonly shorter and thicker than that of the other petals.	2
1B.	Flower exactly zygomorphic, or if the petals are randomly asymmetrical, then the pistil central.	6
2A.	Leaves 3.5 cm or more long; largest leaflets longer than 2 cm long; abaxial centric anther as long or shorter than its immediate neighbors.	***S. atomaria***
2B.	Leaves 0.8-5 cm long, leaflets up to 15 mm long; abaxial centric anther similar to its neighbors in shape, but elevated further by a longer filament.	3
3A.	Leaflets 1 pair per leaf.	***S. monozys***
3B.	Leaflets 2-4 pairs per leaf.	4
4A.	Stipules soon caducous, before their associated leaf matures; mature valves opaque, not elevated above seeds or only in the forming one slight transverse ridge.	***S. wislizeni*** ssp. ***painteri***
4B.	Stipules persistent with its associated leaf; mature valves shiny, elevated above each seed, forming two transverse ridges.	5
5A.	All parts of the plant with appressed pubescence	***S. wislizeni*** ssp. ***wislizeni***
5B.	All parts of the of the plant with pilulose pubescence	***S. wislizeni*** ssp. ***villosa***
6A.	Two long abaxial stamens, antepetals raised laterally to the symmetry of the floral axis, their incurved anthers opposite one another, similar to a crab pliers	***S. alata***
6B.	Two long incurved antepetal stamens together in the opposite plane of the vexillary petal (banner), diverging from each other at a narrow angle or subparallel	7
7A.	Subcaulescent herbs; leaflets 1 pair per leaf, these with whitish-corneous margins; flowers 1-2 per raceme.	***S. pumilio***
7B.	Caulescent, herbaceous, shrubs or trees; leaflets 1-more pairs per leaf, if only 1 pair, margins never whitish-corenous.	8
8A.	Gland present on the petiole at a variable distance below the insertion of the proximal pair of leaflets	***S. occidentalis*** 9
8B.	Gland present in or slightly above the insertion of the proximal pair of leaflets.	9
9A.	Fertile stamens 7, equal or slightly accrescent towards abaxial side of flower; stamens obliquely or horizontally truncate at the orifice, sometimes attenuated at the apex (not beaked); fruit erect or erect-ascending; plants herbaceous.	10

 doi:10.20944/preprints202404.0408.v1

9B.	Fertile stamens 7, 4 of them shorter and straighter and 3 of them more strongly curved, the central one frequently sterile; fruit often (not always) widely spread or pendulous.	21
10A.	Monocarpic plants (die after flowering); fruit valves deeply corrugated between seeds; ovules 6-12.	***S. uniflora***
10B.	Perennial plants, fruit valves superficially corrugated, not deeply sulcate between seeds; ovules 14-44.	11
11A.	Leaflets 1 pair per leaf.	12
11B.	Leaflets 2-9 pairs per leaf.	17
12A.	Leaflets narrow 1.5-9 times as long as wide.	13
12B.	Leaflets wider, 1.3-1.8 times as long as wide.	16
13A.	Leaflets lanceolate to oblong-lanceolate, 2-9 times as long as wide, the longest ones 2-6 cm; style linear, 0.1-0.25 mm diameter.	***S. roemeriana***
13B.	Leaflets oblong to obovate-elliptic, the largest 1.5-4 times as long as broad; style dilated, 0.4-0.6 mm diameter.	14
14A.	Style stout, apically dilated, 0.4-0.6 mm diameter; seeds with rough or colliculate testa.	***S. bahuinioides***
14B.	Style linear, 0.2-0.3 mm diameter; seeds with smooth testa	15
15A.	Leaflets of most leaves shorter than petiole; petals 8.5-9.5 mm long; style 3-3.5 mm long; seeds with pinkish-brown testa	***S. ripleyana***
15B.	Leaflets of most leaves longer than petiole; petals 11-18 mm long; style 1.5-2 mm long; seeds with olive-brown testa	***S. mensicola***
16A.	Sepals soon deciduous with petals; petals 7-13 mm long; anthers with conical apex, the pore obliquely intorse; style 1-1.7 mm long; ovules 38-44; seeds in two series	***S. durangensis***
16B.	Sepals persistent with the fruit in formation; petals 8.5-10 mm long; anthers constricted immediately below terminal symmetrical pore; ovules 16-26; seeds in 1 series	***S. pilosior***
17A.	Stipules 1 mm wide or narrower; leaflets 2-5 pairs; flowers 1-10 flowers per raceme; seed in two series.	18
17B.	Stipules 1-3 mm wide; leaflets 4-9 pairs; flowers 7-45 per raceme; seeds uniseriate.	19
18A.	Leaflets 2-5 pairs per leaf; ovules 22-32; fruit 11-20 mm long.	***S. crotalarioides***
18B.	Leaflets 2 pairs per leaf on almost all leaves; ovules 14-21; fruit 10-14 mm long.	20
19A.	Stems compact, 10 cm long or less; pubescence strigulous-adpressed, trichomes up to 1 mm long.	***S. demissa*** ssp. ***radicans***
19B.	Stems compact, 10-35 cm long; pubescence pilose-pilulous, trichomes 0.8-2 mm long, sparse-ascending or horizontal.	***S. demissa*** ssp. ***demissa***

 doi:10.20944/preprints202404.0408.v1

20A.	Stems and petioles densely hairy, the trichomes fine and erect or retrorse; foliage densely subadpressed-pilulous; petals 10.5-16 mm long; fruit 3.5-6.5 x 0.6-0.9 cm.	***S. lindheimeriana***
20B.	Stems, petioles and foliage minutely antrorse- strigulous; leaflets glaucous; petals 8-10.5 mm long; fruit 4-12 x 0.35-0.6 cm.	***S. orcutii***
21A.	Anthers of the 2-3 fertile abaxial stamens beaked, the beak porrectly incurved and its orifice oblique.	***S. obtusifolia***
21B.	Anthers of the 2-3 abaxial fertile stamens not beaked, the beak symmetrically truncated.	22
22A.	Fruit flattened-compressed or sometimes turgid; Seeds areolated; ovules 28 or less.	***S. guatemalensis*** ssp**.** ***calcarea***
22B.	Fruit cylindrical or strongly turgid; seeds without areoles; ovules 28-150.	23
23A.	Leaflets ovate to lanceolate-acuminate, broadest below middle	***S. septemtrionalis***
23B.	Leaflets obovate, broadest at or above middle	***S. pendula*** ssp**.** ***ovalifolia***

Senna alata (L.) Roxb. Fl. Ind. (Roxburgh) 2: 349. 1832. Basionym: *Cassia alata* L., Sp. Pl. 1: 378. 1753. *Cassia alata* L. var. *perennis* Pampanini, Nuovo Giorn. Bot. Ital. n. ser. 14: 595. 1907. *Cassia bracteata* L. f. sensu Willdenow, Sp. Pl. 2: 525. 1799. *Herpetica alata* sensu Cook & Collins, COntr. U.S. Natl. Herb. 8(2): 159. 1903.

Type: Netherlands, *Clifford s.n.* (Lectotype: BM558725!)

Distinguishing features**:** Shrub, 2-4 m tall, cultivated. Leaves, 25-60 cm long. Leaflets 7-13 pairs per leaf, 6-14 × 3-5 cm, broadly oblong to obovate. Inflorescences terminal, arranged in racemes. Flowers yellow. Petals obovate, basally unguiculate. Fruit 8-16 × 1-2 cm, ascending or perpendicular to the peduncle, tetragonal, with papyraceous and crenated winged margins along the entire length of the body.

Representative examined material: Nuevo León: 8-IX-1986, *E. Estrada 656* (CFNL; MEXU); 9-IX-1986, *E. Estrada 726* (CFNL; MEXU). Tamaulipas: 14-VIII-1996, *M. Freya 002* (UAT).

Comments: widely used as ornamental in northeastern Mexico; out of cultivation it grows on abandoned areas, near human settlements, 300-400 m. Probably originally from the Orinoco and Amazon Basin (Colombia, Venezuela, Brasil) (Irwin & Barneby, 1982), naturalized in many places. In America, from Mexico to Argentina.

Senna atomaria (L.) H.S. Irwin & Barneby, Mem. New York. Bot. Gard. 35(2): 588. 1982. Basionym: *Cassia atomaria* L. Mantissa 68. 1767. *Cassia arborescens* Mill., Gard. Dict. ed 8, *Cassia* no. 15. 1768. *Cassia longisiliqua* L., Fil. Suppl. 230. 1781. *Cassia triflora* Hahl. Ecl. Amer. 3: 11. 1807. *Cassia elliptica* Kunth, Nov. Gen. & Sp. 6: 356. 1824. *Cassia grisea* A. Richard in Sagra, Hist. Fis. Pol. y Nat. Cuba 10: 493. 1846. *Cassia chrysophylla* A. Ricahard in Sagra op. cit. 500. 1846. *Cassia michoacanensis* Sessé & Moc., Pl. Nov. Hisp. 61. 1888. *Cassia elliptica* Sessé & Moc., Fl. Mex. 101. 1893. *Cassia emarginata.* var. *subunijuga* Roob. & Bartl., Proc. Amer. Acad. Sci. 43: 53. 1907. *Isandrina maxonii* Britton & Rose, N. Amer. Fl. 23(5): 269. 1930. *Cassia planisiliqua* sensu Lamarck, Encycl. Méth. 1: 645. 1785.

Type: Mexico, 1-VII-1731, *Houston s.n.* (Holotype: E346696!). Sweden, Uppsala, non date, *J.J. Franz* (Isotype: LINN-HL528-17).

Distinguishing features: Shrub or tree 3-15 m tall. Leaves 8-28 cm long. Leaflets 1-5 pairs, ovate to elliptic, marginally revolute, bicolored, pubescent, Petiole with small, orange branched trichomes. Inflorescence axillar or terminal arising from brachyblasts, arranged in racemes. Flower buds globose (when young). Sepals heteromorphic. Petals yellow-orange, 3 adaxial and opposite to pistil, clawed, the banner, the shortest, the longest petal folding the androecium. Fertile stamens 7, isomorphic, but

 doi:10.20944/preprints202404.0408.v1

the abaxial centric anther as long or shorter than its immediate neighbors. Fruit 22-40 × 0.8-1.5 × 2-3 cm, oblong, straight, coriaceous, brown to black, strongly veined, internally septate.

Representative examined material: Tamaulipas: 12; IV-1986, *R. Jones. R. Treviño 91* (UAT); 18-XI-1992, *J.L. Mora-López 375* (UAT); 9-V-1982, *L. Hernández 260* (UAT); 24-VIII-1986, *L. Hernández 1987*; 19-VII-1994, *J.L. Mora-López 505* (UAT); 7-VIII-1969, *H. Puig 2428* (ASU17892!); 19-V-1983, *A. Brito 135* (BCMEX863!); 3-I-1982, *J.D. Bacon 1707* (NY554718!); 3-III-1961, *R.M. King 4060* (NY554724!); 31-III-1974, *P. Fryxell, R. Magill 2261* (NY554722!); 13/21-IV-1907, *E. Palmer 323* (NY554721!); 28-XII-1972, *J. Tayor, M. Taylor 12486* (NY554726!).

Comments: Recorded only in the state of Tamaulipas, in thorn scrub, deciduous woods. Species widely distributed from Florida USA to South America.

Senna bauhinioides (A. Gray) H.S. Irwin & Barneby, Phytologia 44(7): 499. 1979. Basionym: *Cassia bauhinioides* A. Gray, Boston J. Nat. Hist. 6(2): 180. 1850. *Cassia bauhinioides* var. *arizonica* Macbr., Contr. Gray Herb. n. ser. 59: 27. 1919. *Earleocassia bauhinioides* (A. Gray) Britton ex Britton & Rose, N. Amer. Fl. 23(4): 248. 1930.

Type: Mexico, Chihuahua, Santa Rosalía, 2-V-1847, *J. Gregg s.n.* (Syntype: GH00274794!).

Distinguishing features: Herbaceous perennial. Stems decumbent or erect, pubescent. Leaves bifoliolate. Leaflets 1-2.5 cm long, pubescent, with a reddish-brown gland arising below the insertion of the leaflets. Inflorescences axillar, arranged in racemes. Flowers yellow. Petals 5, free, subequal, 4 obovate-spatulate, the remaining (banner) orbicular. Style short, strong, distally dilated, less than 1.5 mm long, 0.4-0.6 mm diameter. Fruit 1.9-2.5 cm long, ovoid, densely pubescent. Seeds rough.

Representative examined material: Coahuila: 8-V-1992, A. Rodríguez 1492 (ANSM), 17.VI-1992, J.A. Villarreal 6743 (ANSM). Nuevo León: 5-VII-2001, *C. Yen y E. Estrada 12853* (CFNL) 13-VII-2002, *C. Yen y E. Estrada 14812* (CFNL; MEXU); 8-IX-2001, *C. Yen y E. Estrada 13048* (CFNL); 19-VII-2002, *C. Yen y E. Estrada 14950* (MEXU). 26-VIII- 1989, *Hinton* et al. *19592* (MEXU); 15-VIII-1989, *E. Estrada 1705* (CFNL; MEXU); 27-VII-1986, *E. Estrada 535* (CFNL; MEXU). Tamaulipas: 25-VIII-1983, *L. Hernández 603* (UAT); 25-XI-2984, *L. Hernández 1254* (UAT); 4-VI-1985, *J. Jiménez 182* (UAT); 29-V-1986, *L. Hernández 1824* (UAT).

Comments: South of USA and north of Mexico**, f**requent in the low and plains of northesatern Mexico, associated with Tamaulipan thornscrub, *Neltuma* woods, and desert scrub, 190-1900 m.

Senna crotalarioides (Kunth) H.S. Irwin et Barneby, Phytologia 44(7): 499. 1979. Basionym: *Cassia crotalarioides* Kunth, Mimoses 132, pl. 40. 1822. *Chamaefistula crotalarioides* (Kunth) G. Don, Gen. Hist. Dichl. Pl. 2: 452. 1832. *Earleocassia crotalarioides* (Kunth) Britton ex Britton & Rose, N. Amer. F. 23(4): 249. 1930. *Cassia vogeliana* Schltdl., Linnaea 12: 342. 1838.

Type: Mexico, Crescit in collibus siccis, inter fodinam La Valenciana et urbem Guanaxuato (Regno Mexicano)], *A.J.A Bonpland, F.W.H.A. von Humboldt 4256* (P679232!).

Distinguishing features: Herbaceous, perennial, up to 0.5 m long, appressed pubescent or ascending or spreading trichomes. Foliar gland inserted between the proximal pair of leaflets, and frequently present in the other insertions of pairs of leaflets. Leaflets 2-5 pairs per leaf. Inflorescences distal, arranged in racemes. Fruit 1.2-2 × 0.5-0.7 cm, inflated, apically cuspidate, with appressed or ascending trichomes with a bulbous base, sometimes glabrous.

Representative examined material: Coahuila: 10-VII-1880, *E. Palmer 281* (MICH1181877). Nuevo León: 7-VI-2003, *C. Yen y E. Estrada 15676* (CFNL); 21-VI-1989, *E. Estrada C. 1547* (CFNL; MEXU; TEX-LL); 23-VII-1993, *Hinton* et al. *23100* (MEXU; TEX-LL); 27-VII-1969, *J. and H. Meras 3282a* (TEX-LL). Tamaulipas: 22-I-1941/11-VIII-1941. *L.R. Stanford* (NY554890!).

Comments: Endemic to Mexico. High plains in the states of northeastern Mexico, 1400-2200, desert scrub and arid conifer forests Frequent in intermontane valleys, abandoned crop fields and areas with disturbance by overgrazing. Also, from Durango to Hidalgo and Guanajuato**.**

Senna demissa (Rose) H.S. Irwin & Barneby (Rose) H.S. Irwin & Barneby, Phytologia 44(7): 499. 1979. ssp. ***demissa***. Basionym: *Cassia demissa* Rose, Contr. U.S. Natl. Herb. 10(3): 97-98. 1906. *Earleocassia demissa* (Rose) Britton, N. mer. Fl. 23: 2148. 1930.

Type: Mexico, Coahuila, near Carneros Pass, 12-IX-1889, *C.G. Pringle 2783* (Holotype: NY3624!. Isotype: GH53043!; MEXU1167202!).

 doi:10.20944/preprints202404.0408.v1

Distinguishing features: Herbaceous perennial. Stems 7-11 cm long, pubescent with strigulose sub-addpressed hairs, 0.5-1 mm long. Foliar gland stipitate, arising in the insertion of the proximal pair of leaflets. Leaflets almost always 2 pairs, rarely some leaves with 3 pairs, the distal pair the largest, pubescent on both faces. Inflorescences axillary or lateral, arranged on racemes or subumbellate. The two ventral stamens with thecae smaller than the 5 dorsal ones. Fruit 0.8-1.5 × 0.4-0.6 cm, inflated, oblong, straight or slightly curved, appressed or ascending trichomes with a bulbous base.

Representative examined material: Coahuila: 9-VI-1993, *J.A. Villarreal 7188* (ANSM), 12-VIII-2006, *S. Gómez 229* (ANSM), 16-IX-2017, *J.A. Encina 6217* (ANSM).. Nuevo León: 15-V-2003, *C. Yen y E. Estrada 15601* (CFNL); 24-VIII-1989, *J.A. Villarreal* et al. *4940* (ANSM; MEXU); 17-VI-1958, *R.M. Straw, M. Foreman 1379* (MEXU); 16-IX-1980, *J. Henrickson 18518* (MEXU; TEX-LL); 24-V-1992, *L. Hernández 2679* (TEX-LL). Tamaulipas: 5-XII-1984, *O. Briones 1353* (ANSM), 10-XI- 2006, *J.A. Encina 1700* (ANSM); 9-XII-1976, *F. González-M. 10164* (UAT).

Comments: Endemic to northeastern Mexico, including the state of Zacatecas. Associated to rosetophyllous scrublands, common in calcareous soils, frequent in *Pinus cembroides* forest and halophytic vegetation. Common within intermontane valleys, 1,700-2,850 m.

Senna demissa (Rose) H.S. Irwin & Barneby ssp. ***radicans*** (H.S. Irwin & Barneby) H.S. Irwin & Barneby, Phytologia 44(7): 499. 1979. *Cassia demissa* var. *radicans* Irwin & Barneby, Sida 6(1): 9. 1975.

Type: Mexico, Coahuila, SW end of Sierra de la Fragua, 1-2 km N of Puerto Colorado, 2-IX-1941, *I.M. Johnston 8774* (Holotype: TEX00371197!. Isotype: F0057451F!).

Very similar morphologically than var. *demissa*, but varying in stem size and type of pubescence, the ssp. *radicans* having longer (12-35 cm long), and decumbent stems, with the pubescence appressed or of horizontal hairs, 0.8-2 mm long.

Representative examined material: Coahuila: 12-X-1991, *M.A. Carranza 977* (ANSM); 22-VII-1969, *M.W. Bierner 86* (NY 554911!); 25-VII-1880, *E. Palmer 281* (NY 3625!); 1848, *J. Gregg 244* (NY 554917!); 3-VII-1941, *L.R. Stanford 229* (NY 554915!). Tamaulipas: 2-VIII-1985, *J. Jiménez 294* (UAT); 11-VIII-1941, *L.R. Stanford 829* (NY 554914!).

Commments: Endemic to northeastern Mexico. Recorded only from Coahuila and Tamaulipas. In high plains with desert scrub, izotal, *Pinus* and *Juniperus* forest, 1400-1900 m.

Senna durangensis (Rose) H.S. Irwin & Barneby ssp. ***isleyi*** (H.S. Irwin & Barneby) H.S. Irwin & Barneby, Phytologia 44(7): 499. 1979. Basionym: *Cassia duragensis* var. *isleyi* Irwin & Barneby, Sidea 6(1): 11. 1975.

Type: Mexico [Tamaulipas], San Fernando to Santander, X-1830, *J.L. Berlandier 840* (GH00053045!).

Distinguishing features: Herbaceous annual or biennial. Stems with tiny retrorse and introrse trichomes and larger semi-setose horizontal trichomes. Foliar gland arising in the insertion of leaflets. Leaflets 1 pair, bicolored, densely pubescent. Inflorescences axillary and lateral, arranged in racemes. Sepals 5, soon caducous with the corolla. Petals 7-12 mm long. Anthers conical apically, the pore obliquely intorse; style 1-1.7 mm long. Fruit erect, 2.5-4 × 0.5-0.8 cm, sessile, oblong to oblong-elliptic, inflated, papyraceous, with erect trichomes.

Representative examined material: Nuevo León: 20-IV-02, *C. Yen y E. Estrada 14571* (CFNL, MEXU). Tamaulipas: X-1830, *J.L. Berlandier 840* (GH53045!).

Comments: Endemic to southern Texas and northeastern Mexico. Recorded only in Nuevo León and Tamaulipas. Desert scrublands, calcareous soils, 500-1500 m. Also in San Luis Potosí.

Senna guatemalensis (Donn. Sm.) H.S. Irwin & Barneby ssp. ***calcarea*** Irwin & Barneby, Mem. New York Bot. Gard. 35(1): 306. 1982.

Type: Mexico, Tamaulipas, Municipio de Gómez Farias. Sierra de Guatemala. Alt. 4800-5700 ft, 22-VI-1971, *J. R. Sullivan 548* (NY4815!).

Distinguishing features: Shrub 1-6 m tall, densely leafy distally. Pubescence of incurved, yellowish hairs up to 0.5 mm long. Foliar gland arising between the insertion of the proximal pair of leaflets. Leaflets 3-7 pairs per leaf, lanceolar-ovate, deltate or triangular, bicolorous. Inflorescences

 doi:10.20944/preprints202404.0408.v1

axillar, arranged in racemes shorter than leaves. Fruit flattened-compressed or sometimes turgid. Seeds areolated. Ovules 28 or less

Representative examined material: Tamaulipas: 22-VI-1971, *J.R. Sullivan 548* (NY 4815!); 21-VI-1971, *J.R. Sullivan 533* (NY 555071!).

Comments: Endemic to southwestern of Tamaulipas. (Sierra de Guatemala), deciduous woods to oak-pine forest, 300-1600 m.

Senna lindheimeriana (Scheele) H.S. Irwin & Barneby, Phytologia 44(7): 500. 1979. Basionym: *Cassia lindheimeriana* Scheele, Linnaea 21(4): 457-458. 1848. *Earleocassia lindeheimeriana* Britton ex Britton & Rose, N. Amer. Fl. 23(4): 249.1930.

Type: USA, Texas, north of New Braunfels, IX-1846, *F.J. Lindheimer 380* (Isoneotype: BM1042588!; BR5175086!; GH53026!. Isotype: G370869!; US322036!; SI12050!; MICH1107182!; M217107!; NY3612!).

Distinguishing features: Herbaceous, erect, up to 1.5 m tall. Stems densely pubescent with antrorse or retrorse trichomes up to 1 mm long. Stipules ascending, lanceolate, up to 1 cm long, densely hairy. Leaflets 5-8 pairs per leaf, , pubescent. Petiolar glands subulate, arising between the insertion of each pair of leaflets. Inflorescences axillar or terminal, arranged in racemes. Sepals marginally membranous. Fruit 5-6 × 0.5-0.6 cm, ascending or spreading, oblong, compressed, brown, inertly dehiscent.

Representative examined material: Coahuila: 8-IX-1990, *R. Vázquez 101* (ANSM), 27-IX-2001, *J.A. Encina 909* (ANSM), 27-IX-2001, *M.A. Carranza 3599B* (ANSM). Nuevo León: 23-VII-2002, *C. Yen y E. Estrada 15075* (CFNL); 16-V-2003, *C. Yen y E. Estrada 15655* (CFNL). 1-X-1993, *Hinton 23787* (MEXU; TEX-LL); 9-XI-2002, *C. Yen y E. Estrada 15187* (CFNL); 30-X-2002, *M. González y E. Estrada 15210* (CFNL). Tamaulipas: 3-X-1984, *G. Malda 88* (UAT); 14-IX-1983, *MCDondald 873* (UAT).

Comments: Southern USA and north of Mexico. Common in most plant associations in northeastern Mexico, 190-2800 m.

Senna mensicola (H.S. Irwin & Barneby) H.S. Irwin & Barneby, Phytologia 44(7): 500. 1979. Basionym: *Cassia mensicola* Irwin & Barneby, Sida 6(1): 11-13. 1975.

Type: Mexico, San Luis Potosí, Charcas, VII/VIII-1934, *C.L. Lundell 5345* (Holotype: CAS0001432!. Isotype: MEXU91738!; TEX371205!; TEX371204!. Paratype: Mexico, San Luis Potosí, Ex convalli San Luis Potosí, 1877, *J.W. Schaffner 1877* (MEXU52112!)).

Distinguishing features: Herbaceous perennial. Stems densely hairy with short, retrorse trichomes mixed with few trichomes or ascending setae up to 1 mm long. Foliar gland, arising between leaflets. Leaflets 2, the blade longer than petiole, densely subappressed pubescent. Inflorescences axillar or subterminal, arranged in racemes. Sepals up to 9.5 mm long, deciduous with the corolla. Petals whitish when dry, up to 1.8 cm long. Style 1.5-2 mm long. Fruit 2.3-3.5 × 0.4-0.6 cm, ascending, sessile, hispid-setose. Seeds olive-brown.

Representative examined material: Coahuila: 10-X-1989, *J.A. Villarreal 5395* (ANSM). Nuevo León: 15-VIII-1989, E. Estrada C. 1705 (CFNL, TEX-LL); 28-V-1987, *Hinton* et al. *19127* (TEX-LL); 21-VIII-1973, *J. Bacon y M. Reynolds 635* (TEX-LL); 15-VII-1998, *Hinton* et al. *27205* (TEX-LL); 26-VIII-1987, *D. Bogler, T. Atkins 141* (TEXLL). Tamaulipas: 24-V-1976, *F. González-Medrano 9069* (MICH1182162).

Comments: Endemic to Mexico. Common in desert scrub, along roadsides and halophytic grasslands. Also in Zacatecas, San Luis Potosí and Hidalgo, 1000-2250 m.

Senna monozyx (H.S. Irwin & Barneby) H.S. Irwin & Barneby, Phytologia 44(7): 500. 1979. Basionym: *Cassia monozyx* Irwin & Barneby, Sida 6(1): 16. 1975.

Type: Mexico, Coahuila de Zaragoza; Sierra Paila (Valle Seco), General Cepeda. Alt. 1800 m, 6-VII-1944, *G.B. Hinton 16565* (Holotype: NY3645!; GBH16565!. Isotype: US342651!; GH53064!).

Distinguishing features: Shrub, up to 1.5 m tall, intricately branched, the branches subspinescent, appressed pubescent, trichomes incurved, up to 0.2 mm long. Leaves up to 1.5 cm long. Leaflets 1 pair per leaf, 0.3-1 cm long. Inflorescences terminal, arranged in short racemes. Stamen abaxial centric with the anther similar to its neighbors in shape, but elevated further by a longer filament. Fruit 8-10 x 0.7-8 cm, declinate or ascending, linear, straight or curved, compressed, lustrous when mature, the valves swelling over the seeds.

 doi:10.20944/preprints202404.0408.v1

Representative examined material: Coahuila: 24-VI-1989, *A. Rodríguez 1126* (ANSM), 30-VIII-1980, *R. Vázquez 44* (ANSM)7-VI-1986, *J.A. Villarreal 3301* (ANSM); 19-VIII-1967, *W.L. Minckley, D. J. Pinkava 4212*! (LL).

Comments: Endemic to the central region of the state of Coahuila. Plains and alluvial canyons with desert scrub, 700-900 m.

Senna obtusifolia (L.) H.S. Irwin & Barneby, Mem. New York Bot. Gard. 35: 252. 1982. Basionym: *Cassia obtusifolia* L., Sp. Pl. 1: 377. 1753. *Cassia tora* Persoon, Syn. Pl. 1: 456. 1805. *Cassia toroides* Raf., Med. Bot. 96. 1828. *Senna toroides* Roxb., Fl. Indica 2: 341. 1832. *Diallobus uniflorus* Raf., Sylva Tellur. 128. 1838.

Type: Sri Lanka, *P. Herman, s.n.* (Lectotype: BM628410!).

Distinguishing features: Herbaceous. Stems erect stems, up to 0.8 m tall. Leaflets 3 pairs per leaf, emarginate or obtuse apically. Foliar gland arising on the insertion of the proximal pair of leaflets. Inflorescences axillar, arranged in racemes, paired or solitary. Sepals pubescent marginally. Corolla slightly zygomorphic, petals strongly reticulate. Anthers of the 2-3 fertile abaxial stamens beaked, the beak incurved, its orifice oblique. Fruit 16-22 cm long, linear, sub-flattened, reticulated, longitudinally dehiscent.

Representative examined material: Nuevo León: 15-IV-87, *E. Estrada 890* (CFNL); 25-IX- 1986, *E. Estrada 682* (CFNL, MEXU). Tamaulipas: 11-X-1985, *O. Briones 702* (UAT).

Comments: Widely distributed in tropics of America and Asia, In America, from Florida and Texas to Argentina. Frequently associated to riparian communities, and disturbed areas. Recorded in Nuevo León and Tamaulipas in Tamaulipan thornscrub and subtropical woods, 200-400 m.

Senna occidentalis (L.) Link, Handb. 2: 140. 1829. Basionym: *Cassia occidentalis* L., Sp. Pl. 377. 1753. *Ditremexa occidentalis* (L.) Britton & Rose ex Britton & Wilson, Sci. Surv. Puerto Rico & Virgin Is. 5(3): 372. 1924. *Cassia falcata* L., Sp. Pl. 377. 1753. *Cassia planisiliqua* L., Sp. Pl. 377. 1753. *Cassia caroliniana* Walter, Fl. Carol. 135. 1788. *Cassia foetida* Persoon, Syn. 1: 457. 1805. *Cassia macradena* Colladon, Hist. Casses 132. 1816. *Cassia ciliata* Raf. Fl. Ludov. 100. 1817. *Cassia obliquifolia* Schrank, Denkschrift. Bot. Ges. Regensburg 2(1): 40. 1822.

Type: Unknown Country, *P. Browne s.n.* (Neotype: LINN-HL528-13!).

Distinguishing features: Herbaceous suberect or prostrate, up to 1.5 m tall, bad smelling. Stems glabrous. Foliar gland arising at or near the base of the petiole. Leaflets 5-6 pairs per leaf, ovate. Inflorescences axillar or terminal, arranged in corymbose racemes. Flowers yellow. Petals strongly reticulate. Fruit 9-10.5 × 0.6-0.8 cm, oblong, subcylindrical, slightly flattened, glabrous, with margin widened and lighter in color, persistent for a long time, dark brown.

Representative examined material: Nuevo León: 2-VII-2002, *C. Yen y E. Estrada 11670* (CFNL); 22-X-2002, *C. Yen y E. Estrada 15162* (CFNL); 10-V-1997, *J.A. Villarreal 8603* (ANSM; MEXU); 28-VII-1993, *Hinton* et al. *22884* (TEX-LL). Tamaulipas: 11-X-1985, *O. Briones 2119* (ANSM), 25-XI- 1984, *L. Hernández 1279* (ANSM); 12-II-1993, *J.L. Mora-López 239* (UAT); 25-XI-1984, *L. Hernández 1279* (UAT); 4-XI-1985, *M. Martínez 847* (UAT); 15-IX-1986, *J. Torres 366* (UAT).

Comments: Recorded only in the states of Nuevo León and Tamaulipas. Frequent in different plant communities with disturbance, also in abandoned crop fields, 360-1250 m. Widely distributed in America (Mexico to Argentina), mainly in tropical areas. Also in Africa, India, China, Hawaii Islands, Micronesia and Australia.

Senna orcuttii (Britton & Rose) H.S. Irwin & Barneby, Phytologia 44(7): 500. 1979. Basionym: *Peiranisia orcuttii* Britton & Rose, N. Amer. Flo. 23(4): 267. 1930.

Type: 26-VI-1924, *C.R. Orcutt 653* (Holotype: NY4552!. Isotype: CAS26106!).

Distinguishing features: Herbaceous or subshrub. Stems, petioles and foliage minutely antrorse-strigulous. Leaflets 3-6 pairs per leaf,glaucous. Foliar gland arising in the insertion of the proximal pair of leaflets or in all pairs. Very similar in growing habit to *S. lindheimeriana,* differing in the type of pubescence, *S. orcuttii* has antrorse, strigulose pubescence and longer petals (8-10.5 mm long) and longer (4-12 cm long) but narrower (0.3-0.6 mm) ascending, linear, straight or incurved, coriaceous, bicarinate, brown fruit, .

 doi:10.20944/preprints202404.0408.v1

Representative examined material: Coahuila: 29-VII-1973 *M,C. Johnston 11905* (ANSM), 12-X-1991 *M.A. Carranza 856* (ANSM): 29-VII-1973, *M.C. Johnston 11905* (NY1584435!); 9-VII-1991, *S. Aguilar*; 29-VII-1973, *M.C. Johnston 11905* (NY1584435!); 9-VII-1991, *S. Aguilar R. 87* (SR3960!).

Comments: South of Texas and New Mexico in USA, and northeastern Mexico, recorded only in the north part of Coahuila, in desert scrublands, on gentle slopes of mountains and stony hills.

Senna pendula (Humb. & Bonpl. ex Willd.) H.S. Irwin & Barneby ssp. ***ovalifolia*** H.S. Irwin & Barneby, Mem. New York Bot. Gard. 35(1): 391. 1982. *Cassia ovalifolia* M. Martens & Galeotti, Bull. Acad. Roy. Brux. 10(9): 305. 1843. *Adipera ovalifolia* (M. Martens & Galeotti) Britton & Rose, N. Amer. Fl. 23(4): 241. 1930. *Cassia botteriana* Benth. Trans. Lin. Soc. Lond. 27: 541. 1871. *Adipera submontana* Britton & Rose, N. Amer. Fl. 23(4): 241. 1930.

Type: Mexico, IV-1840/X-1840, *H.G. Galeotti 3260* (BR5174966!).

Distinguishing features: Shrub or tree, 1-4 m tall. Leaf gland arising in the insertion of the proximal pair of leaflets, rarely also in the second one. Leaflets 3-5 pairs per leaf, obovate. Sepals of different sizes, the longest 0.7-1 cm long. Petals of different sizes, the longest one 1.5-1.6 cm long. Anthers of the 2-3 abaxial fertile stamens not beaked, the beak symmetrically truncated. Two of the filaments 0.7-1 cm long Fruit terete 10-15 x 1-1.5 cm.

Representative examined material: Tamaulipas: 11-XI-1975, *A.A. Lesseigne 4895* (NY1585056); 14- 3-III-1961, *R.M. King 4048* (NY1585055!).

Comments: Recorded only in the state of Tamaulipas. In deciduous woodlands, adjacent to riparian areas, piedmont scrub and several type of forest, 30-1200 m. Widely distributed, from southern Texas through Mexico to Venezuela.

Senna pilosior (B.L.Rob. ex J.F.Macbr.) H.S. Irwin & Barneby, Phytologia 44(7): 500 (1979). *Cassia bauhinioides* var. *pilosior* B.L. Rob. ex MacBride, Contr. Gray Herb. 59: 27. 1919. *Cassia pilosior* (B.L.Rob. ex J.F.Macbr.) H.S. Irwin & Barneby, Sida 6(1): 10. 1975.

Type: USA, Texas, Bofecillos Mountains (West Texas), IX-1983, *V. Havard, 14* (GH53012!).

Distinguishing features: Herbaceous, perennial. Stems pubescent, with three types of trichomes, the smaller one short retrose, accompanied with tiny glanduliform ones, the other stiff erect or incurved lustrous setae, up to 1 mm long, subhorizontal and longer setae. Leaflets 1 pair per leaf, bicolored, gray-pubescent, golden appearance adaxially. Foliar gland arising in the insertion of the leaflets. Inflorescences axillar or lateral, arranged in racemes or subumbellate. Sepals persist with the fruit in formation. Petals 8.5-10 mm long. Anthers constricted immediately below terminal symmetrical pore. Ovules 16-26. Fruit erect, 2-4 × 0.5-8 cm, oblong, with trichomes and setae, persistent after dehiscence.

Representative examined material: Coahuila: 29-VII-1076, *A. Roig 113* (ANSM), 5-IX-1981, *A. Rodríguez 405* (ANSM), 28-III-2007, *J.A. Encina 5704* (ANSM; 9-VI-1960, *D.J. Pinkava 5153* (ASU0017926!); 14-VI-1968, *D.J. Pinkava 5685* (ASU0017928!); 11-VIII-1940, *I.M. Johsnton, C.H. Muller 127* (USF173694!).

Comments: Endemic to southern Texas and north of Mexico. Recorded only in the state of Coahuila. In desert scrublands, 600-1450 m.

Senna pumilio (A. Gray) H.S. Irwin & Barneby, Phytologia 44(7): 500. 1979. Basionym: *Cassia pumilio* A. Gray, Boston J. Nat. Hist. 6(2): 180. 1850. *Tharpia pumilio* (A. Gray) Britton & Rose, N. Amer. Fl. 23(4): 247. 1930.

Type: USA, Llano and Pedernales [Rivers], 1847, *F.J. Lindheimer s.n.* (Lectotype: GH53031!).

Distinguishing features: Tiny herbaceous, perennial, sub-acaulescent, up to 13 cm tall. Leaflets 1 pair per leaf, linear to lanceolate with whitish-corneous margins. Foliar gland arising between the insertion of the leaflets. Inflorescences originating from the base of the plant, long pedunculate, peduncles 5-10 cm long, surpassing the leaves, with 1-2 terminal flowers. Stamens with anthers longer than filaments. Fruit 0.7-1.5 × 0.5-0.8 cm, obovoid, reflexed, sessile, inflated, densely appressed-pubescent papyraceous.

Representative examined material: Coahuila: 23-V-1980 *M.A. Carranza 1138* (ANSM), 13-VI-1957, *R. McVaugh 14803* (MEXU). Nuevo León: 20-VII-2002, *C. Yen y E. Estrada 14970* (CFNL); 15-XI-90, *E. Estrada 1925* (CFNL); 13-VII-2002, *C. Yen y E. Estrada 14806* (CFNL, MEXU).

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Comments: Southeastern Texas and northern Mexico, from Chihuahua and Durango to Coahuila and Nuevo León. Low plains, in sandy soils with Tamaulipan thornscrub, mezquitales (*Neltuma glandulosa* and *N. laevigata*), desert scrub, halophytic grasslands, 250-1700 m.

Leaflets of most leaves shorter than petiole; petals 8.5-9.5 mm long; style 3-3.5 mm long; seeds with pinkish-brown testa

Senna ripleyana (H.S. Irwin & Barneby) H.S. Irwin & Barneby, Phytologia 44(7): 500. 1979. Basionym: *Cassia ripleyana* H.S. Irwin et Barneby, Sida 6(1): 13-14. 1975.

Type: México, Chihuahua, 18 mi W of Jiménez. Alt. 4700 ft., 2-X-1965, *H.D.D. Ripley, R.C. Barneby 13904* (NY3654!)

Distinguishing features: Herbaceous, sub-acaulescent or short caulescent. Stems 5-19 cm long, branched basally, pubescence curved, ascending up to 1 mm long or smaller, mixed with longer ones. Leaflets 1 pair per leaf, shorter than petiole, pubescent, ashy abaxially, green adaxially. Foliar gland arising in the insertion of the leaflets. Inflorescences terminal, arranged in racemes, slightly longer than foliage. Sepals, marginally membranous. Petals whitish-brown when dry. Fruit 1.5-2.5 × 0.5-0.8 cm, oblong, straight or curved, ascending, inflated, papyraceous, pubescent, dehiscent.

Representative examined material: Coahuila: 11-VIII-1974 *A. Rodríguez 1370* (ANSM); 2-IV-1982, *A. Rodríguez 1029* (NY 1585471!); 11-IX-1993, *Hinton 22997* (TEX189382!); 25-VII-1993, B.L. Turner, K. Clary, T.F. Patterson 93-115 (TEX189383!). Nuevo León: 1-VII-99, *C.Yen y E. Estrada 10969* (CFNL); 23-VII-1999, *E. Estrada 10422* (CFNL); 19-VII-1999, *E. Estrada 10342* (CFNL).

Comments: Recorded in Coahuila and Nuevo Léon. Southwestern Texas and north of Mexico, from Chihuahua to Nuevo Léon and Zacatecas. In desert scrub and halophytic grasslands. In Texas (USA) it is recognized as a vulnerable species (Poole et al., 2007).

Senna roemeriana (Scheele) H.S. Irwin & Barneby, Mem. New York Bot. Gard. 35(1): 282. 1982. Basionym: *Cassia roemeriana* Scheele, Linnaea 21: 457. 1848. *Earleicassia roemeriana* (Scheele) Britton ex Britton & Rose, N. Maer. Fl. 23(4): 247. 1930.

Type: USA, the Upper Guadalupe, VIII-1845, *F.J. Lindheimer 381* (Isolectotype: GH274785!).

Distinguishing features: Herbaceous, perennial. Stems pubescent, pubescence of two types, one of tiny trichomes erect or subretrorse and ascending setae up to 0.7 mm long. Leaflets 1 pair per leaf, lanceolate, 2-9 times as long as wide, strigulose. Inflorescences arranged in racemes. Style linear, 0.1-0.25 mm diameter. Fruit erect or ascending, 2.0-3.5 × 0.4-0.6 cm, oblong, laterally compressed but turgid, brown, appressed pubescent, dehiscent.

Representative examined material: Coahuila: 12-X-1991 *M.A. Carranza 850* (ANSM), 25-V-2016, *J. Encina 5404* (ANSM); 18-IV-2017, *J. Encina 5741*(ANSM); 25-V-2016, *J. Encina 5404* (ANSM); 18-IV-2017, *J. Encina 5741*(ANSM); Nuevo León: 15-IV-1906, *C.G. Pringle 13751* (TEX-LL).

Comments: Recorded in Nuevo León and Coahuila. In desert scrublands, transition of Tamaulipan thornscrub to desert shrublands in north of Mexico, 300-1600 m. From Oklahoma, New Mexico and Texas to Coahuila, Nuevo Léon and Zacateca.

Senna septemtrionalis (Viv.) H.S. Irwin & Barneby, Mem. New York Bot. Gard. 35(1): 365. 1982. Basionym: *Cassia septemtrionalis* Viv., Elench. pl. hort. Bot. J. Car. Dinegro 14. 1802. *Cassia laevigata* Willd., Enum. pl. hort. Berol. 441. 1809. *Cassia elegans* Kunt, Nov. Gen. & Sp. 6: 342. 1824. *Senna aurata* Roxb., Fl. Indica 2: 342. 1832. *Cassia vernicosa* Clos in Gay, Hist. Chile, Flora 2: 244. 1854. *Adipera laevigata* (Willd.) Britton & Rose in Britton & Wilson, Sci. Surv. Porto Rico & Virgin Is. 5(3): 371. 1924. *Chamaefistula laevigata* (Willd.) G. Don, Gen. Hist. Dichl. Pl. 2: 452. 1832.

Type: No type known to survive (Irwin & Barneby, 1982).

Distinguishing features: Shrub 1.5-5 m tall, unarmed. Leaflets 2-3 pairs per leaf, ovate-lanceolate, broadest below the middle. Foliar gland arising at insertion of proximal pair of leaflets. Inflorescences axillar, arranged in racemes. Sepals subequal, 3 internal, broad, the 2 external similar but narrower. Corolla slightly irregular, petals subequal in shape and size, 3 obovate, the remaining 2 obovate with truncated or retuse apex. Fruit 8.5 cm long, linear-oblong, slightly turgid, glabrous.

Representative examined material: Coahuila: 16-VII-1993 *M.A. Carranza 1607* (ANSM). Nuevo León: 2-VIII-1994, *Hinton* et al. *24569* (MEXU). Tamaulipas: 6-IV-1996, *C. Ramos* 18 (CFNL); 16-III-1991, *E. Estrada 2005, J. Fairey, C. Schoenfeld* (CFNL); 6-X-2000, *E. Estrada 13146* (CFNL).

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Comments: In cool, warm or mesic oak forest and, oak-pine forest, rain forest, and disturbed places, 800-1500 m. From northeastern Mexico to South America and distributed widely on the planet. In northeastern Mexico the plant is used as ornamental.

Senna uniflora (Mill.) H.S. Irwin & Barneby, Mem. New York Bot. Gard. 35: 258 1982. Basionym: *Cassia uniflora* Mill., Gard. Dict., ed. 8. ed. 8, *Cassia* no. 5. 1768.

Type: Mexico, 1-VII-1730, *Houston s.n.* (E346665!)

Distinguishing features: Monocarpic shrub 1.5-5 m tall, malodorous. Leaflets 2-3 pairs per leaf. Stems with tiny fine trichomes, mixed with subappressed forwardly, 1-2 mm long setae. Leafles 3-5 pairs per leaf, obovate to spatulate, with setae abaxially. Foliar gland arising in almost all insertions of a pair of leaflets but the last or also the penultimate. Inflorescences axillar, arranged in racemes, shorter than leaves. Petals withering quickly (one day), the longest one up to 8 mm long, drying brick-red, Fruit 2.5-5 × 0.3-0.5 cm, straight or almost so, bicarinate, brown to black, setose and deeply corrugated between seeds, appearing a false loment, internally septate, dehiscent.

Representative examined material: Tamaulipas: 9-Xi-1984, *S. Rodríguez 251* (UAT); 26-IX-1985, *P. Moya 72* (UAT); 21-X-1983, *L. Hernández, F. Gonzélez-Medrano, C. Cortes 800* (UAT); 8-XI-1996, *C. Ramos 150* (CFNL); 6-III-1983, *M.H. Nee 25750* (NY1585904!); 1-I-1910, *E. Palmer 44* (NY 1585877!);

Comments: Recorded only in the state of Tamaulipas, but widely distributed in Tropical America, from north of Mexico to Brazil. In the northeastern region, in disturbed tropical and subtropical native communities, anthropogenically altered.

Senna wislizeni (A. Gray) H.S. Irwin & Barneby ssp. ***painteri*** (Britton & Rose) H.S. Irwin & Barneby, Mem. N.Y. Bot. Gard. 35(2): 574. 1982. Basionym: *Palmerocassia painteri* Britton ex Britton & Rose, N. Amer. Fl. 23(4): 254. 1930. *Cassia wislizeni* var. *painteri* (Britton & Rose) H.S. Irwin & Barneby, Phytologia 44(7): 500. 1979. *Cassia wislizeni* var. *painteri* (Britton & Rose) H.S. Irwin & Barneby, Sida 6(1): 16. 1975.

Type: Mexico, Querétaro de Arteaga; Near Higuerillas, 23-VIII-1905, *J. N. Rose; J. H. Painter, J. S. Rose 9807* (Holotype: NY4527!).

Distinguishing features: Physiognomically very similar to *S. w.* ssp. *wislizeni*, but the ssp. *painteri* has caducous stipules, and opaque or dull fruit, never shiny, and the valves are not bulged above seeds, or if so, then with only one transverse crest.

Representative examined material: Coahuila: 25-VI-2002, J.A. Encina 1218 (ANSM). Nuevo León: 31-V-2003, *C. Yen y E. Estrada 15667* (CFNL); 21-VI-2003, *C. Yen y E. Estrada 15764* (CFNL; MEXU); 7-VI-2003, *C. Yen y E. Estrada 15682; Peña Nevada, 8-VI-2003, C. Yen y E. Estrada 15745* (CFNL), 7-VI-2003, *C. Yen y E. Estrada 15678* (CFNL); 2-VIII-1980, *Hinton* et al. *17906* (TEX-LL); *R. Torres* et al. *1100* (MEXU); 29-VIII-1989, *E. Estrada 1713* (CFNL; MEXU; TEX-LL). Tamaulipas: 25-VII-1985, *D. Méndez 98* (UAT).

Comments: Endemic to Mexico, from Coahuila to Tamaulipas and to south to Querétaro, including Zacatecas and San Luis Potosí, at highlands associated with desert scrublands, 1400- 2000 m.

Senna wislizeni (A. Gray) H.S. Irwin & Barneby ssp. ***villosa*** (Britton) H.S. Irwin

& Barneby, Phytologia 44(7): 500. 1979. *Palmerocassia villosa* Britton ex Britton & Rose, N. Amer. Fl. 23(4): 254. 1930. *Cassia wislizeni* var. *villosa* (Britton & Rose) H.S. Irwin & Barneby, Sida 6(1): 16. 1975.

Type: México, Durango; Mapimi and vicinity, 21/23-X-1898, *E. Palmer 518* (Holotype: NY4528!. Isotype: GH64314!; MO-128869!).

Distinguishing features: Physiognomically very similar to *S. w.* ssp. *wislizeni*, both having persistent stipules, but ssp. *villosa* having pilosulous pubescence, never appressed and mostly with 2-3 pairs of leaflets per leaf.

Representative examined material: Coahuila: 21-X-1989, *J.A. Villarreal 5525* (ANSM), 25-VIII-1988, *J.A. Villarreal 4440* (ANSM), 4-IX-2007, *J.A. Alba 208* (ANSM),30-VI-1941, *L.R. Stanford 129* (NY1586158!).

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Comments: Endemic to north of Mexico, recorded only from the states of Coahuila, also in Durango. Associated to desert scrublands, in plains, canyons, mountains slopes, alluvial fans, in calcareous and gypsic soils, 1100-1600 m.

Senna wislizeni (A. Gray) H.S. Irwin & Barneby ssp. ***wislizeni*** (Britton & Rose) H.S. Irwin & Barneby, Mem. N.Y. Bot. Gard. 35(2): 574. 1982. Basionym: *Cassia wislizeni* A. Gray, Pl. Wright. 1: 60. 1852. *Palmerocassia wislizeni* (A. Gray) Britton & Rose, N. Amer. Fl. 23(4): 254. 1930.

Type: Mexico, Carizal and Ojo Caliente, S. of El Paso, *F.A. Wislizenus 107* (Holotype: GH53035!. Isotype: MO-121484!).

Distinguishing features: Shrub, 1.5-4.5 m tall. Stems appressed-pubescent in the whole plant. Stipules persistent. Leaflets 3-5 pairs per leaf, olive green or glaucous, strigulous. Inflorescences axillar, arranged in racemes or panicles. Peduncles persistent and spinescent when drying. Sepals yellowish, green or purple-brown. Petals yellowish, dark veined, unguiculate, 4 sub-equal in shape but of different sizes, the remaining asymmetrical, clawed. Fruit 9-15 × 0.5-0.8 cm, linear, flattened, subcoriaceous, shiny when ripe, brown or blackish, reticulate, bulging over seed, like two parallel, transverse crests, internally septate.

Representative examined material: Coahuila: 19-IX-1971, *J.S. Henrickson 6877* (TEX420586!).

Comments: Southern USA (Texas, New Mexico and Arizona) to north of Mexico (From Sonora to Coahuila). Recorded only for the state of Coahuila, associated with desert scrublands, 1400-1600 m.

Subfamily Cercidoideae Legume Phylogeny Working Group, Taxon 66(1): 88. 2017. Cercideae Bronn, Form. Pl. Legumin.: 134: 131. 1822.

Shrubs or trees, unarmed.Stipules free. Leaves unifoliolate with the blade entire or bilobed, or bifoliolate, and the lealfets opposite. Inflorescences arrnaged in racemes or pseudoracemes. Flowers hermaphrodite, strongly or slightly billateraly symmetrical, sometimes papilionated in appearance. Calyx of free 2-5 sepals or united, forming an spathaceous structure. Petals 1-5, free, imbricate, the banner (adaxial petal), the innermost, frequently different in shape from the rest of the petals. Stamens 1-10, sometimes staminodes present. Filaments partly connate or free. Fruit flattened, dehiscent, inertly or explosively, with the valves coiling helically after dehiscence. Subfamily composed by 12 genera and approximately 335 species [1]. In nortehastern Mexico only two genera present, *Bauhinia* and *Cercis.*

1A.	Leaves simple; flowers pink or purple, papilionate in appearance, 1.5 cm long or shorter; fruit winged on adaxial margin.	***Cercis***
1B.	Leaves bifoliolate or if simple, always bilobed; flowers pink, purple or white, not papilionate in appearance, greater than 1.5 cm long; fruit with entire edges, without wing on the adaxial margin	***Bauhinia***

Bauhinia L., Sp. Pl. 1: 374-375. 1753. *Pauletia* Cav., Icon 5: 5. 1753. *Amaria* Mutis, Sem. Nuev. Rey. Gran. 2. 25. 1810. *Casparia* Kunth, Ann. Sci. Nat. 1: 85. 1824. *Perlebia* Mart., in Spix et Mart. Reise Bras. 2: 555. 1828.

Type: *Bauhinia divaricata* L., Sp. Pl. 1: 374 (1753).

Shrub or trees, unarmed (in northeastern Mexico). Leaves entire, bilobed or bifoliolate, palmate veined. Inflorescences solitary, axillar or terminal, arranged in racemes, panicles or paired. Flowers zygomorphic. Calyx gamosepalous, zygomorphic, almost entirely fused, free apically, 2-5-lobed or forming a spathaceous structure. Petals 5 or less or only one, free, imbricate, equal or subequal, unguiculate, spatulate to filiform, red, pink, greenish, yellow or white. Stamens 10, fused basally, 3-5 or all fertile, or 9 abortive and sterile (staminodes) and only 1 fertile, free or partially fused. Pistil of the same size as the androecium. Fruit flattened, woody, elastically dehiscent or indehiscent.

Pantropical genus [71] represented by approximately 150-160 species [4]. Mostly diversified in South America (75 species), 35 in North and Central America, 32 in Africa and Madagascar [4]. Twenty seven arboreal Bauhinias are recorded for Mexico and Central America [55]. At least 30

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species recorded from Mexico [28]. Six wild species have been recorded for northeastern Mexico [72) and one cultivated.

1A.	Fertile stamens 5; cultivated plants	2
1B.	Fertile stamen 1-3; wild plants	3
2A.	Petals pink, violet, purple with colored spots	***B. variegata*** var. ***variegata***
2B.	Petals white	***B. variegata*** var. ***candida***
3A.	Fertile stamens 3	***B. coulteri*** ssp**. *coulteri***
3B.	Fertile stamen 1	4
4A.	Leaves entire, bilobed, but the blade never completely divided into two leaflets	5
4B.	Leaves bifoliolate, its blade completely divided in two leaflets	6
5A.	Petals pink or purple; leaf lobes wide and rounded apically	***B. marcanthera***
5B.	Petals white or whitish-cream; leaf lobes narrow and triangular or acute apically	***B. divaricata***
6A.	Leaflets 5-9 cm long, narrow and gradually acute apically	***B. bartlettii***
6B.	Leaflets up to 3 cm long, wide and rounded apically	7
7A.	Petals white; young fruits glabrate or almost so	***B. lunarioides***
7B.	Petals pink, dark-pink to purple; young fruits densely pubescent	8
8A.	Leaflets 1.7-5 cm long, mostly 3-veined	***B. ramosissima*** ssp**. *ramosissima***
8B.	Leaflets 0.4-1.5 cm long, mostly 2-veined	***B. ramosissima*** ssp. ***uniflora***

Bauhinia bartlettii B.L. Turner, Phytologia 76: 4. 1994.

Type: Mexico, Tamaulipas: Mpio. Hidalgo, W of Santa Engracia into the sierra, 7.2 mi W of Guayabas, 4.0 mi W of the Guayabas-Adelaida junction. 24°1’ N, 99°34’ W, 16-IV-1988, *G. Nesom, L. Hernández, M. Martínez, J. Jiménez 6312* (Holotype: TEX371176!. Isotype: MEXU488030!).

Distinguishing features: Shrub or tree up to 6 m tall. Leaflets 2 per leaf, parallel to divaricate, 5-9 x 1-4 cm, lanceolate, gradually acute apically, slightly falcate, glabrate. Inflorescences axillar or subterminal. Petals pink to purple. Stamen 1 (fertile), staminodes 9, basally connate. Fruit 5-16 x 1.5-2 cm, oblong, light brown, subglabrous.

Representative examined material: Tamaulipas: 9-XI-2001, *E. Estrada 13191* (CFNL); 7-V-1986, *García 2214* (MEXU); 22-III-1987, *García 2908* (MEXU); 19-III-1998, *A. Mora-Olivo 6808* (UAT).

Comments: Endemic to south end of the state of Tamaulipas, associated with deciduous woods, stony hills, 350-700 m.

Bauhinia coulteri Macbr., Contr. Gray Herb. 59: 22. 1919. ssp. ***coulteri*.** Basionym: *Bauhinia platypetala* Benth. ex Hemsl., Diagn. Pl. Nov. 1: 49. 1880. *Casparia coulteri* (Macbr.) Britton & Rose, N. Amer. Fl. 23: 216. 1930. *Bauhinia coulteri* forma *albiflora* Wunderlin, Rhodora 70: 286, 1968.

Type: Mexico, Hidalgo, Zimapán, *T. Coulter 531* (Isotype: NY3424!).

Distinguishing features: Small shrub, up to 1 m tall, leaves sub-glaborus with smooth margins. Flowers pink with 3 fertile stamens.

Representative examined material: Tamaulipas: 2-XI-2020, *E. Estrada et al., 25115* (CFNL); 28-V-1976, *F. González-Medrano 9269* (UAT); 19-VI-1985, *L. Hernández 1483* (UAT); 20-I-1976, *F. González-Medrano 9923* (UAT); 16-VI-1987, *G. Nesom 5996* (UAT).

Comments: Endemic to Mexico. Outide of the study area, also in San Luis Potosí, Hidalgo, and Querétaro. Easily recognizable from the other species of this genus since it is the only *Bauhinia* in

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northeastern Mexico with the presence of 3 fertile stamens. Stony soils, associated with oak and oak-pine forest, 800-1200.

Bauhinia divaricata L., Sp. Pl. 374. 1753. Basionym: *Mandarus divaricatus* (L.) Raf. Sylva Tellur. 122. 1838. *Casparia divaricata* (L.) Kunth ex Britton & Rose, N. Amer. Fl. 23: 215. 1930. *Bauhinia aurita* Ait, Hort. Kew. 2: 48. 1789. *Bauhinia porrecta* Sw. Prodr. 66. 1788. *Bauhinia latifolia* Cav. Icon. 5: 4. 1799. *Bauhinia retusa* Poir., Encyc. Suppl., 1: 599. 1811. *Bauhinia racemifera* Desv., J. Bot. 3: 74. 1814. *Bauhinia americana* Laun, Herb. Amat. 5: 315. 1821. *Bauhinia lamarckiana* DC., Prodr. 2: 512. 1825. *Bauhinia spathacea* DC., Prodr. 2: 512. 1825. *Bauhinia furcata* Desv. Ann. Sci. Nat. 9: 429. 1826. *Bauhinia dansoniana* Guill. & Per., Flor. Seneg. Tent. 1: 265. 1832. *Bauhinia versicolor* Bertol., Hort. Bonon. Pl. Nov. 1: 7. 1838. *Bauhinia mexicana* Vog., Linnaea 13: 299. 1839. *Bauhinia schlechtendaliana* M. Martens & Galeotti, Bull. Brux. 10: 308. 1843. *Bauhinia ambliopnylla* Harms in Loess., Bull. Hebr. Boissier 7: 548. 1899. *Bauhinia confusa* Rose, Contr. U.S. Nat. Herb. 10: 97. 1906. *Bauhinia goldmanii* Rose, Contr. U.S. Nat. Herb. 10: 97. 1906. *Bauhina caribaea* Jennings, Ann. Carnegie Mus. 11: 127. 1917. *Bauhinia peninsularis* Brandegee, Univ. Calif. Publ. Bot. 10: 183. 1922. *Bauhinia divaricata* var. *angustiloba* Ekman & Urban, Ark. Bot.24A: 8. 1931.

Type: Mexico, State of San Luis Potosi. Tamasopo Canyon, *25-VI-1890, C.G. Pringle 3104* (Isotype: M217258!; UC101719!; JE1091!; NDG24149!; GH59707!; PUL270!).

Distinguishing features: Shrub or tree up to 8 m tall. Leaves orbicular, bilobed, the lobes narrow and triangular or acute-rounded apically, parallel or divaricate. Fertile stamen 1. Petals white or whitish-cream (sometimes turning pale pink with age).

Representative examined material: Tamaulipas: 12-X-2002, *E. Estrada 15157, J.Pérez G.* (CFNL); 12-XII-1987, *E. Estrada 1056* (CFNL); 24-IX-1985, *M. Yanez 583* (CFNL); 19-III-1988, *E. Estrada 1372* (CFNL); 21-II-1981, *L. Hernández 1003* (CFNL); 24-V-1996, *C. Ramos 56* (CFNL); 30-III-2003, *E. Estrada 15394* (CFNL); 8-IV-1998, *A. Mora-Olivo 6995* (UAT); 26-IX-1990, *J. Sifuentes 60* (UAT); 27-VI-1992, *J.L. Mora-López 182* (UAT); 22-VIII-1986, *M. Martínez 1228* (UAT); 21-VIII-1985, *M. Yanez 429* (UAT).

Comments: In Baja California Sur and Tamaulipas to the south to Central America (Costa Rica). In deciduous woods, adjacent to rain forest areas, high and medium evergreen forests, also in disturbed places in subtropical areas.

Bauhinia lunarioides A. Gray ex S. Watson, Bibl. Ind. N. Amer. Bot. 205. 1878. Basionym: *Bauhinia congesta* (Britton & Rose) Lundell, Phytologia 1: 214. 1937. *Casparia congest* Britton & Rose, N. Amer. Fl. 23: 211. 1930. *Bauhinia jermyana* (Britton) Lundell, Phytologia 1: 214. 1937. *Casparia jermyana* Britton in Britton & Rose, N. Amer. Fl. 23: 211. 1930.

Type: Mexico, Coahuila, near Santa Rosa, I-1853, *C.C. Parry 290a* (Holotype: GH59714!).

Distinguishing features: Shrub up to 4 m tall. Leaves bifoliolate, its blade bilobate for at least three quarters or more of its length or completely divided in two leaflets. Leaflets up to 3 cm long, suborbicular slightly divergent. Inflorescences subterminal or distal. Fertile stamen 1, staminadoes 9. Petals white (rarely light-pink). Fruit 5-8 × 1-2 cm, oblong, pale brown, glabrate.

Representative examined material: Coahuila: Coahuila: 10-VIII-1980, *R. Vázquez 14* (ANSM), 10-V-1981, *L. Rodríguez 159* (ANSM); 27-VIII-1984, *J.A. Villarreal 2674* (ANSM). Nuevo León: 9-IV-2001, *C. Yen y E. Estrada 12035* (CFNL); 7-VIII-1992, *E. Estrada 2425, C. Schoenfeld, J. Fairey* (CFNL); 24-VI-2001, *E. Estrada 12825* (CFNL); 20-VII-2002, *C. Yen y E. Estrada 14977a* (CFNL); 15-IV-2001, *C. Yen y E. Estrada 12363* (CFNL); 6-VII-2001, *C. Yen. E. Estrada 12973* (CFNL).

Comments: Endemic to northeastern Mexico and south end of Texas (USA). *B. lunaroioides* is physiognomically very similar to *B. ramosissima*, but both species can be distinguished by the color of the flowers, white in *B. lunarioides* and dark-pink in *B. ramosissima*. In semiarid scrublands in stony soils of slopes in low hills, piedmont scrub, and desert scrublands, 450-1600 m.

Bauhinia macranthera Benth. ex Hemsl., Diag. Pl. Nov. 49. 1880. Basionym: *Casparia macranthera* (Bent. ex Hemsl.) Britton & Rose, N. Amer. Fl. 23: 212. 1930. *Bauhinia retifolia* Standl., COntr. U.S. Nat. Herb. 23: 416. 1922. *Casparia lunarioides* A. Gray ex Britton & Rose, N. Amer. Fl. 23: 212. 1930. *Bauhinia macranthera* var. *grayana* Wunderlin, Phytologia 15: 53. 1967.

Type: Mexico, *Coulter, s.n.* (Holotype: K264626!).

 doi:10.20944/preprints202404.0408.v1

Distinguishing features: Shrub 1-6 m tall, unarmed. Leaves simple, entire, bilobed, the lobes fused at the base by 0.6-3 cm long, lobes 3-11 cm, basally cordate, apex of lobes rounded, ovate to suborbicular. Inflorescences axillar or subterminal, arranged in racemes. Petals pink or dark-purple. Fertile stamen 1, staminodes 9, basally fused to the middle portion. Fruit 8-15 × 1-2 cm, linear to oblong, flattened, dehiscent, brown, tomentose or glabrous.

Common species in piedmont scrub and oak-pine forests, 570-1800 m.

Representative examined material: Coahuila: 27-VI-1936, *F.L. Wynd 316* (ANSM), 6-VI-1991, *J.A. Villarreal 5965* (ANSM), 20-iV-2017 *J.A. Encina 5788* (ANSM). Nuevo León: 7-VII-2001, *C. Yen y E. Estrada 13004* (CFNL); 14-IV-2001, *C. Yen y E. Estrada 12159* (CFNL); 22-IX-2001, *C. Yen y E. Estrada 13095* (CFNL); 26-XI-1987, *E. Estrada 1030* (CFNL); 23-VII-2002, *C. Yen y E. Estrada 15034* (CFNL). Tamaulipas: 22-VI-1996, *C. Ramos 109* (CFNL); 15-III-1991, *E. Estrada 1963, J. Fairey, C. Schoenfeld* (CFNL); 16-VI-2007, *E. Estrada 20039* (CFNL); 4-VII-1994, *L. Hernéndez 3154* (UAT).

Comments: Easily recognized by its only 1 fertile stamen, leaves entire but deeply divided in rounded lobes, not triangular as in *B. divaricata*. Northeastern to central Mexico. In northeastern Mexico in piedmont scrub, transitions of piedmont scrub to oak-pine and oak-pine forest, 570-2200 m..

Bauhinia ramosissima Benth. ex Hemsl. ssp. ***ramosissima*.** Basionym: *Bauhinia unguicularis* Benth. ex Hemsl., Diag. Pl. Nov. 49. 1880. *Casparia purpusii* Britton in Britton & Rose, N. Amer. Fl. 23: 210. 1930. *Casparia runyonii* Britton & Rose, N. Amer. Fl. 23: 120. 1930.

Type: Mexico, Zimapán, *Coulter 472* (Holotype: K501150!).

Distinguishing features: Shrub, up to 3 m tall. Leaves bifoliolate, its blade completely divided in two leaflets. Leaflets 1.7-5 cm long, apically rounded, mostly 3-veined, Fertile stamen 1. Petals pink, dark-pink to purple. Young fruits densely pubescent.

Representative examined material: Coahuila: 4-VII-1981 *A. Rodríguez 513* (ANSM). 22-VII- 1992 *J.A. Villarreal 6686* (ANSM). Nuevo León: 22-III-2003, *C. Yen y E. Estrada 15355* (CFNL); 16-V-1981, *J.M. Poole* et al. *2296* (MEXU); 16-V-1981, *Hinton 18262* (MEXU). 9-IV-1994, *T.F. Patterson 7477* (MEXU). Tamaulipas: 18-IX-1985 *R. Díaz 488* (ANSM); 9-XII-1976, *F. Guevara 10167* (UAT).

Comments: Endemic to Mexico. Recorded only in the states of Nuevo León and Tamaulipas. Outside of the study area, also in San Luis Potosí, Hidalgo, and Querétaro. Both varieties of *B. ramosissima* physiognomically (mainly in the type of leaves and leaflets) resembles *B. lunarioides*, but this last species has white flowers. The ssp. *ramosissima* occurs in mountain slopes with stony soils, in semiarid scrublands, piedmont scrub, and also in transitions to oak-forest, 670-1800 m.

Bauhinia ramosissima ssp. ***uniflora*** (S. Watson) M.P. Ramírez & R. Torres, Brittonia 59(4): 364. 2007. Basionym: *Bauhinia uniflora* S. Watson, Proc. Amer. Acad. Arts 21: 451. 1886. *Caspatia uniflora* (S. Watson) Britton & Rose, N. Amer. Fl. 23: 209. 1930. *Casparia monantha* Britton & Rose, N. Amer. Fl. 23(4): 210. 1930.

Type: Mexico, Chihuahua [in fact, Coahuila], Jimulco, 27-IV-1985, *C.G. Pringle 174* (Isotype: P756112!).

Distinguishing features: Shrub up to 2 m tall. Leaves bifoliolate, its blade completely divided in two leaflets. Leaflets 0.4-1.5 cm long, mostly 2-veined. Fertile stamen 1. Petals pink, dark-pink to purple; young fruits densely pubescent.

Representative examined material: Coahuila: 24-IX-2010 *J. Alba 536* (ANSM), 17-VI-2014 *J.A. Encina 4270* (ANSM), 26-V-1982 *J. Valdés 1488* (ANSM), 14-X-1986 *J.A. Villarreal 3610* (ANSM). Nuevo León: 26-III-1994, *Hinton* et al. *24051* (TEX-LL); 9-VI-2001, *J. Medellín s.n.* (CFNL). Tamaulipas: 3-VII-1985, *P. Hiriart 752* (UAT); 12-II-1976, *F. González-Medrano 8566* (UAT); 20-IX-1993, *G. Nesom 7670* (UAT); 26-VII-1985, *M. Yanez 289* (UAT); 18-IV-1976, *P. Zavaleta 8741* (UAT); 28-V-1986, *L. Hernández 1798* (UAT).

Comments: Endemic of Mexico. This variety has shorter leaflets and occurs in the same habitats as ssp. *ramosissima*. Also in Chihuahua, Durango, San Luis Potosí, Hidalgo, and Querétaro.

Bauhinia variegata var**. *candida*** Voigt, Hort. Suburb. Calcutt. 253. 1845.

Type: not seen.

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Distinguishing features: Morphology similar to the var. ***variegata***, also with 5 fertile stamens per flower, but always with white petals.

Representative examined material: Nuevo León, 27-III-2024, *E. Estrada 26145* (CFNL). Tamaulipas: 1-IV-2024, *A. Mora-Olivo s.n.* (UAT).

Comments. Native in the south of Yunnan, China. Due to its showy foliage and flowering, widely cultivated as ornamental in tropics and subtorpics around the world. In the northeast of Mexico it is grown successfully in public and private parks and sidewalks, especially Nuevo León and Tamaulipas.

Bauhinia variegata L., Sp. Pl. 1: 375. 1753 var. ***variegata***. Basionym: *Bauhinia chinensis* (DC.) Vogel, Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur. 19(1): 42. 1843. *Bauhinia decora* Uribe, Fl. Antioq. 193. 1941. *Phanera variegata* (L.) Benth., Pl. Jungh. [Miquel] 2: 262. 1852.

Type: Colombia, non nate, *L.U. Uribe 445* (Isotype: US00001278!).

Distinguishing features: Cultivated tree or shrub, 3-9 m tall. Leaves simple, 5-20 cm long suborbicular, bilobed, the lobes rounded. Inflorescences terminal or axillary, arranged in racemes, rarely solitary. Flowers pink, lilac or white. Calyx spathaceous. Corolla zygomorphic, petals 5, free. Stamens 6, 5 of them fertile, subequal or slightly smaller than petals, staminode 1. Fruit 10-22 × 1.5-2.4 cm, oblong, flattened, glabrous, elastically dehiscent.

Representative examined material: Nuevo León: 6-III-2001, *E. Estrada 12696* (CFNL); Rancho Barrial, 31-VII-1971, *S. Brockwell 2* (TEX-LL). Tamaulipas: 15-III-1986, *C.G. Romo 416* (UAT); 21-II-1985, *R. Ddíaz 296* (UAT); 17-III-1993, *J.L. Mora-López 250* (UAT).

Comments: Due to the color and size of its showy flowers, this species is frequently used as an ornamental in public and private gardens. Native of the Yunnan province (China).

Cercis L., Sp. Pl. 1: 374. 1753.

Type: *C. siliquastram* L., Sp. Pl. 1: 374. 1753.

Trees or shrubs, deciduous, unarmed. Leaves simple, alternate, palmately veined. Inflorescences arranged in short racemes, sometimes resembling umbels. Flowers purple-pink, appearing before the leaves. Pedicels articulated. Flowers bisexual, 5-merous, pink or light-purple. Calyx gamosepalous, 5-dentate, teeth triangular, magenta-red, persistent until fruit development. Corolla zygomorphic, papilionoid in appearance, dialypetalous, petals 5, 3 petals reflexed, in a vertical position, the central one smaller, the banner (innermost petal), and 2 non-reflexed petals (horizontal position) at its side, attached to each other, forming a keel that contains the androecium and gynoecium. Stamens 10, free, filaments basally pubescent. Fruit laterally flattened, slightly and narrowly winged at one side, veined, reddish-brown, tardly dehiscent along both sutures.

Genus represented by 10 [4] - 11 species [73], four species in North America, one in Europe, one in Asia, and four in China [73].

Cercis canadensis L., Sp. Pl. 374. 1753. Basionym: *Cercis occidentalis* var. *texensis* S. Watson, Bibliogr. Index N. Amer. Bot. 209. 1878. *Cercis reniformis* Engelm. ex A. Gray, Boston J. Nat. Hist. 6: 177. 1850. *Cercis canadensis* var. *texensis* S. Watson, Bibliogr. Index N. Amer. Bot. 209. 1878. *Cercis mexicana* Rose, N. Amer. Fl. 23(4): 202. 1930. *Cercis canadensis* L. var. *mexicana* (Rose) M. Hopk., Rhodora 44: 208. 1942.

Type: USA, Paul Woody Nursery, North Carolina, 24-VII-2003, *P.R. Fantz 7401* (NCSC25!. Isotype: NCSC29!).

Distinguishing features: Tree or shrub, 3-8 m tall, young branches, reddish, densely pubescent. Leaves orbicular. Calyx reddish brown. Banner orbicular or suborbicular, unguiculate basally, curved backwards. Ovary pubescent. Fruit 5-7.5 × 0.8-1.2 cm, oblong, acute at both ends, flexible, with a small wing running longitudinally along one side, dark-brown or dark-reddish, transversely reticulated, glabrous.

Representative examined material: Coahuila: 30-V-1993 *J.A. Villarreal 5906* (ANSM); 23-VIII-2014, *J. Encina 4013* (CFNL); 17-V-2008, *S.G. Gómez 507, E.F. García* (CFNL). Nuevo León: 21-IV-2000, *C. Yen y E. Estrada 11406* (CFNL); 3-III- 1988, *E. Estrada C. 1349* (CFNL; MEXU); *22-IX-2001, C. Yen y E. Estrada 13075* (MEXU); 13-IV-2002, *C. Yen y E. Estrada 14548* (CFNL; MEXU); 2-III-2003, *C. Yen y E. Estrada 15219* (CFNL). Tamaulipas: 2-VI-1986, *M. Martínez 1176* (CFNL); 20-II-1990, *I. Mata 31* (CFNL);

 doi:10.20944/preprints202404.0408.v1

17-II-1996, *C Ramos 67* (CFNL). Tamaulipas: 5-V-1988, *C.G. Romo 650* (UAT); 28-II-1986, *L. Hernández 1675* (UAT); 16-V-1994, *M. Martínez 2291* (UAT).

Comments: In northeastern Mexico, plants show morphological features such as the margin, shape, and texture of the leaves and the pubescence on branches, leaves and inflorescences that corresponds to both of the recognized varieties for northeastern Mexico (var. *texensis* and var. *mexicana*) (Hopkins, 1942), however, in the collected (and herbarium) samples, the morphological characteristics that distinguish them from a cline or overlap with each other, so they cannot be differentiated from each other concerning their infraspecific distinction. Common in oak and oak-pine forests; sometimes in piedmont scrub, 850-2400 m. In northeastern Mexico this species is known as *duraznillo*, used as ornamental in private gardens.

Subfamily Detarioideae Burmeist., Handb.Naturgesch: 319. 1837.

Trees or shrubs, unarmed. Leaves pinnate, paripinnate, sometimes bifoliolate or unifoliolate. Leaflets opposite or alternate on rachis, sometimes with transclucent glands. Innflorescences arranged in racemes or panicles. Flowers hermaphroite or unisexual, actinomorphic or zygomorphic but not papilionate. Sepals 4-5 (rarely to 7), two of them (adaxial ones) fused, rarely absent or less than four. Petals present or absent, when present 5-7, imbricate, the adaxial one, the outermost, similar in size or the adaxial one the largest, the other four samellr or only the abaxial one smaller or rudimentary. Stamens commonly 10, but sometimes 2-numerous, the filmaents connate or free, the anthers opening by longitudinal slits. Fruit dehiscent or indehiscent, woody or the valves thin and samaroid. Subfamily composed by 84 genera and approximately 760 species [LPWG, 2017). In Mexico five genera present (*Cynometra, Dicymbe, Hymenaea, Peltogyne*, and *Tamarindus*). In northeastern Mexico only one species recorded, *Tamarindus indicus*.

Tamarindus Gen. Pl., ed. 5. 1754. (Monotypic genus).

Type: *Tamarindus indica* L., Sp. Pl. 1: 34. 1753.

Tamarindus indica L., Sp. Pl. 1: 34. 1753. Basionym: *Tamarindus occidentalis* Gaertn., Fruct. Sem. Pl. ii. 310. t. 146. *Tamarindus officinalis* Hook., Bot. Mag. 77: t. 4563 (1851).

Type: Unknown Country, *Anon s.n.* (Lectotype: LINN-HL49-2!).

Distinguishing features: Unarmed tree up to 15 m tall. Branchlets in zigzag. Leaves pinnate. Leaflets 9-16 pairs per leaf, mucronate, glabrous, reticulate-veined, closing against the rachis at night. Inflorescences lax and pendulous, axillary or terminal racemes, shorter than the leaves. Flowers yellow, red-veined, bisexual. Calyx 4-lobed, the lobes with reddish tones, overlapping when young. Petals 5, the upper 3 elliptical, yellow with red veins, the lower 2 small, resembling scales. Fertile stamens 3, exerted from the petals, united and forming a tube with small staminodes. Ovary stipitate, style apically swollen. Fruit pendulous, 7-15 × 2-3.5 cm, compressed, irregularly constricted with a thin brittle and dry outer layer, breaking irregularly when dry, a pulpy median layer with fibers and an internal leathery, septate layer between the seeds. Seeds square to rhomboid, laterally compressed, brown, shiny.

Representative examined material: Nuevo León: 23-IV-2006, *E. Estrada 19874* (CFNL); 6-VII-2003, *C. Yen y E. Estrada 15893* (CFNL).

Comments: Species widely used as ornamental tree in Mexico, and for its edible pulp, consumed as a tangy delicacy. It is a common ingredient in the preparation of sauces and dressings, and its use to prepare refreshing drinks. Probably native to Africa, today it is cultivated in many parts of the world.

3. Discussion

Worldwide, the Caesalpinioideae subfamily consists of 4,600 species included in 135 genera, of which approximately 3,400 species and 90 genera are included within the Mimosoideae clade [7], the remaining 1,200 species and 90 genera are included within the tribes Caesalpinieae and Cassieae. Twenty one of the generic flora, and approximately 6% of the planet's species included in both of these tribes are represented in northeastern Mexico. The family Fabaceae is present throughout the entire surface of Mexico, however, its diversity is more abundant in southern Mexico, especially in the tropical zones and particularly in the geopolitical borders of Oaxaca and Chiapas, where several

 doi:10.20944/preprints202404.0408.v1

floristic provinces converge [74], however, the diversity of species and genera of Caesalpinioideae and Cercidoideae may be equally diverse in some regions of northeastern Mexico. The state of California (USA) and the Valley of Mexico, are the two areas under comparison that present the smallest number of genera and species of the subfamilies Caesalpinioideae, Cercidoideae and Detarioideae, at least two factors are evident, the latitude in California and the altitude in the Valley of Mexico, both have consequences in the low diversity of these plant groups, since they are more abundant in subtropical and tropical areas [7] and seasonally dry tropical froest [Schrire et al., 2005.], mainly at low and medium altitudes, generally below 2,000 m. With the recent changes in the systematics of Fabaceae [1], the subfamily Caesalpinioideae increased the number of genera, from 9 to 13 in northeastern Mexico, adding new genera: *Coulteria, Denisophytum, Erythrostemon*, and *Guilandina*. But also, these taxonomic modifications also altered the number of species in genera that were partitioned into new entities. This is the case of *Caesalpinia*, with approximately 20 species in northern Mexico, now 19 of them were transferred to the new genera or to others such as: *Conzattia* [5], *Coulteria* [5], *Denisophytum* [5], *Erythrostemon* [4,5], *Guilandina* [5], *Hoffmannseggia* [5,58], and *Pomaria* [5,59]. Of the three subfamilies studied, the Caesalpinioideae is the most diversified in Mexico as well as in northeastern Mexico, followed by Cercidoideae and Detarioideae. It is interesting to note that the diversity of subfamily Caesalpinioideae in northeastern Mexico is similar to that of Chiapas [22], but greater than tha of Tabasco [21], Quintana Roo [25], and Yucatán [31]. This may be due, in large part, to the climatic diversity present in northeastern Mexico [75], much more heterogeneous than the respective from the south, where many species of *Senna* and *Chamaecrista* of arid lands inhabit these areas and are absent in the south of the Tropic of Cancer. Although all the compared areas present up to two genera of the subfamily Cercideae, the diversity of species is contrasting, and, with the exception of the state of Chiapas, the northeastern Mexico is home to the greatest diversity of species, and like the previous subfamily, there are species with distribution restricted to the north of the Tropic of Cancer, as is the case of several species of *Bauhinia*. Of the total species recorded for the three subfamilies, 88% are native and 12% are exotic in northeastern Mexico, and all these last species belong to the arboreal or shrubby growth forms. Thirty percent of all genera belonginig to Caesalpinioideae in Mexico are recorded also for the northeastern Mexico. Caesalpinieae is the most diverse tribe in both, genera and species of Caesalpinioideae in northeastern Mexico. The growth forms of the three subfamilies are represented by: herbaceous (33 taxa), shrubs (22 taxa) and trees (16 taxa), including their infraspecific categories. In general terms, the majority of herbaceous species are recorded in the semi-arid zones, between 100-1,800 m altitude of Nuevo Léon and Coahuila, while the majority of tree species are recorded in the tropical or subtropical zone of Tamaulipas. Shrub species are found in both areas. Of the endemic legume species recorded, 22 of them, approximately 34% of their diversity, are exclusive to Mexico, and nine are shared with the state of Texas, a geographical region that floristically includes, together with Mexico, the Megamexico. Forty seven percent of the genera of the tribes Caesalpinioideae and Cercidoideae present at least one species endemic to Mexico or Megamexico, these are: *Bauhinia, Chamaescrista, Conzattia, Coulteria, Denisophytum, Erythrostemon, Hoffmannseggia, Parkinsonia*, and *Pomaria*. Eleven percent (7 species) of the recorded legumes are endemic to northeastern Mexico. The genera with the highest number of endemisms for the northeast of Mexico are *Bahunia* and *Pomaria*. Only *Bauhinia bartlettii* and *Senna guatemalensis* ssp. *calcarea* are endemic to one state, Tamaulipas.

4. Materials and Methods

Study Area

Northeast Mexico is represented by the states of Tamaulipas (80,249 Km^2), Nuevo Léon (64,156 Km^2) and Coahuila (151,595 Km^2) (Figure 4). Within this surface are three large physiographic provinces, the Eastern Sierra Madre, the Northern Gulf Coastal Plain and the Great North American Plain. Within this surface are three large physiographic provinces, the Eastern Sierra Madre, the Northern Gulf Coastal Plain and the Great North

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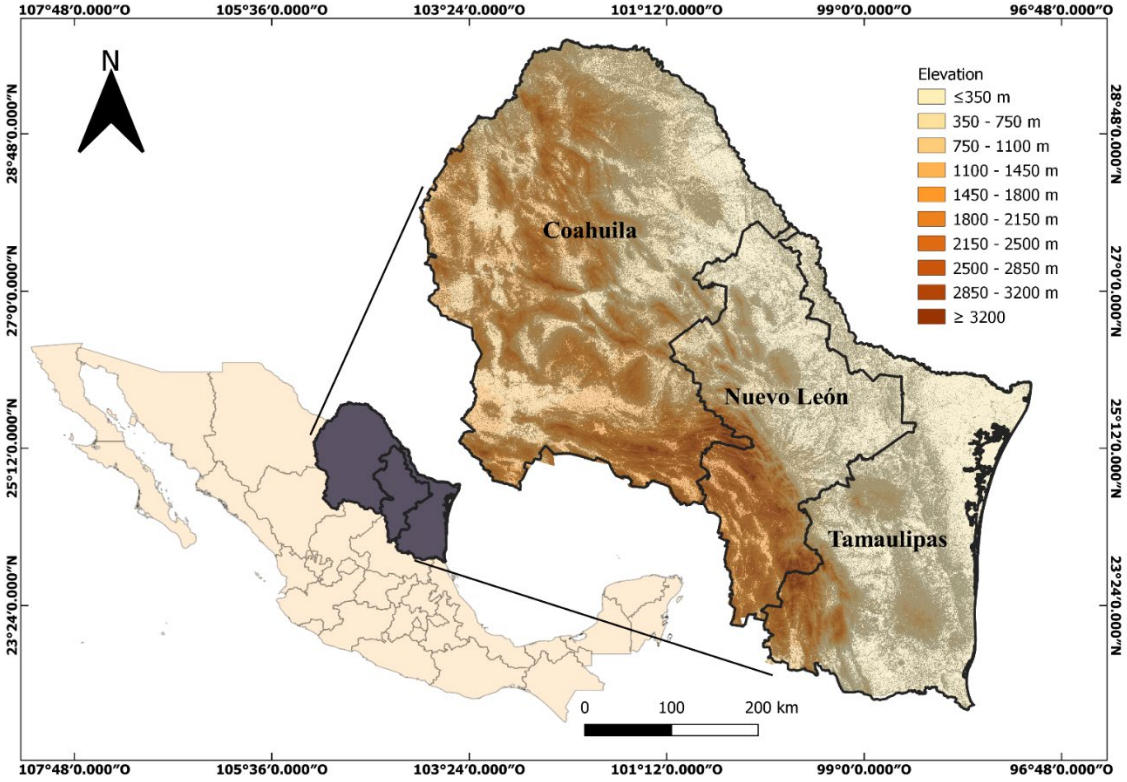

Figure 4. The northeastern Mexico comprise three states, Coahuila, Nuevo León, and Tamaulipas.

American Plain. Both latitudinally and longitudinally, contrasting changes in vegetation are perceived as a result of the variability of soil, relief, and climate [76]. The variability of soils is evident and is mainly due to their physical and chemical properties [76]. Likewise, the climate is extraordinarily varied, especially along the altitudinal gradient [75], where four of them are predominantly tropical, dry, temperate and temperate [77,78]. The altitudinal gradient in the northeast of Mexico is extraordinarily marked, varying from extensive low plains (0-150 m altitude), passing to low hills (200-600 m), steep mountains (900-1,600 m), high plains (1,400- 1,800 m) to high peaks (3,600 m) [75]. The effects of this rich physiographic, climatic and edaphic variability have visible physiognomic effects on the diversity of vegetation types, since six of the nine main vegetation types of Mexico are present in this region.

The effects of this rich physiographic, climatic and edaphic variability have visible physiognomic effects on the diversity of vegetation types, since in this region several of these are present, among which stand out: xeric scrub, low deciduous forest, evergreen tropical forest, mountain cloud forest, grasslands, oak forest, oak-pine forest, coniferous forest and subalpine meadow [32,75]. Legumes (Fabaceae), as one of the three groups of plants best represented in Mexico (), are distributed in practically all plant communities in northeastern Mexico, sometimes being the predominant and most ecologically important elements (19,75]. So the aim of this study is to know the diversity of legumes of the subfamilies Caesalpinioideae, Cercidoideae and Detarioideae distributed in the different environments of northeastern Mexico.

All authors have more than 30 years of experience in plant systematics, flora and vegetation studies in this area of Mexico, as well as in the collection, pressing, identification and storage of botanical specimens in scientific collections of national and foreing herbaria sucha as: (ANSM, CAS, CFNL, CIIDIR, ENCB, IBUG, IEB, MEXU, NY, SD, TEX-LL, and UAT).

As we did in our previous work on this family of plants in northeastern Mexico [19], this study consisted of two main phases, the first was to capture in a database all the genera and species of Fabaceae, subfamilies Caesalpinioideae, Cercidoideae and Detarioideae in the northeastern Mexico present in the scientific literature. The database was expanded with personal collection records of

 doi:10.20944/preprints202404.0408.v1

species of this family of each of the authors in the study area. In order to complement the entire diversity of this family, botanical specimens from the scientific collections of specimens in the national herbaria were included: ANSM, CFNL, MEXU, and UAT after identification of species (when they are not identified), correction of their identification (when was necessary) and the adaptation of the new nomenclature accepted by the changes in the systematics of these subfamilies and their genera. The second phase consisted of finding records of legume species from northeastern Mexico in foreign herbaria (CAS, MICH, NY, TX-LL, US) where, from experience, we know that plant samples from this area are stored. At the same time, the databases of these herbaria were used as well as their high-resolution digital photographs. The databases of digital images of type specimens from the JSTOR Global Plants database were consulted. In the representative material examined, the symbol "!" indicates that the type specimen for the species was observed by the authors. The accepted scientific names follow WFO (World Flora Online) [79].

To know the diversity of the subfamilies Caesalpinioideae, Cercidoideae and Detarioideae, different dichotomous keys were created, A) to separate the tribes within the subfamily (when necessary, 2) to separate the genera within each subfamily or tribe, and, 3) to separate species within each genus. These keys include the main morphological characters useful for the differentiation of the groups: growth habit, biological form, dimensions, type of leaf (simple, pinnate, bipinnate), number of pinnae per leaf and whether the leaf ends in a single pinae or a pair of pinnae, number of leaflets per pinna (bipinnate leaves) or number of leaflets per leaf (pinnate leaves), presence or absence as well as the shape of the leaf glands, type of inflorescence, type and size of flower, shape, size and color of the corolla, number and type of stamens (isomorphic or heteromorphic) and staminodes (when present) per flower, as well as size, shape, symmetry, texture, type of pubescence (when present) and color of the fruit, as well as size, shape and seed color.

For the species, the recognized and currently accepted scientific names are included. In addition, the type species for each of the genera and the type specimen for each of the species are incorporated. The synonymy of each of the genera and species (basionyms, homomymy and heteronymy) is also contained. As a fundamental part of the species, a morphological description of each subfamily, tribe, genera, species and infraspecific category was added, which contains the distinctive characters and some of the most characteristic morphology for their recognition. At the end of each description, comments are added, providing information regarding its global, regional or endemic distribution, ecology, and main uses (when known). The tribes, genera and species are arranged alphabetically.

To know the diversity of the legume flora of the subfamilies Caesalpinioideae, Cercidoideae and Detarioideae of northeastern Mexico and compare it with other areas where it is known, both in Mexico and in some areas of the southern United States, all the recent, currently available in each of the following regions literature was consulted: USA: states of Texas [80] and California [81]. Mexico: western region: the Sonoran Desert [27], the state of Durango [23]; south-central region: El Bajío [29] and the Valley of Mexico [28]; southwest region: the region of Novo Galicia [30], and the southern region: the states of Quintana Roo [25], Yucatán [31], Chiapas [22] and Tabasco [21].

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