



Review [Revisión]

**WOODY AND SEMI-WOODY PLANTS, WILD AND NATIVE TO
 DRY AND SEMI-HUMID FORESTS FROM THE ÁREA DE
 PROTECCIÓN DE FLORA Y FAUNA MESETA DE CACAXTLA,
 SINALOA, MÉXICO †**

**[PLANTAS LEÑOSAS Y SEMILEÑOSAS SILVESTRES, NATIVAS DE
 LOS BOSQUES SECOS Y SEMIHÚMEDOS DEL ÁREA DE
 PROTECCIÓN DE FLORA Y FAUNA MESETA DE CACAXTLA,
 SINALOA, MÉXICO]**

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SUMMARY

Background. Plant catalogues are basic to propose and manage natural protected areas. Through those censuses plans and conservation strategies are developed, plus comparisons can be made over time. Updated floristic listings are urgent in tropical forests due to the threats to their biodiversity. **Objective.** Present a structured listing by family, genus and species, which quantifies the hierarchical relations of genera-species and family-genera while arranging life-forms and including species with endangered status recorded in national (NOM-059 SEMARNAT 2010) and international (Red list, UICN) legislation of woody and semi-woody plants from dry and semi-humid forest from the Área de Protección de Flora y Fauna Meseta de Cacaxtla, Sinaloa, México (APFFMC). **Methodology.** Published studies about the site were reviewed, selecting the indigenous species with secondary growth, excluding the invasive, naturalized, cultivated, ornamental ones, collating different online sites, specialized bibliography and consulting specialists. Regarding the nomenclature different sources and databases were employed. Through field trips, the presence of taxa was corroborated and new registers were included. The listing was sorted alphabetically. **Results.** 60 families, 223 genera and 389 species were recorded. Fabaceae was the family with the highest taxa richness, with 44 genera and 75 species, followed by Malvaceae (19/31), Euphorbiaceae (12/34), Asteraceae (10/17), Cactaceae (9/21) and Apocynaceae (8/10). A low number of 13 genera and 12 families gathered five or more species and genera respectively. On the other hand, a high quantity of 210 genera and 48 families presented four or less taxa. The most diverse genera were *Croton* (12 species), *Bursera* (8), *Solanum* (7), *Ficus* and *Randia* (6); *Opuntia*, *Merremia*, *Euphorbia*, *Lonchocarpus*, *Mimosa*, *Senna*, *Jatropha* and *Sideroxylon* (5). The tree category grouped 146 species, followed by shrub (114), sub-shrub (54), vine (51), succulent and semi-succulent (21) and parasitic (3). According to the NOM 059 SEMARNAT-2010 endangered species list, five species were included in the Amenazadas (A) category and two Sujetas a protección especial (Pr). The red list (UICN) comprehended 173 species for the Natural Protected Area (ANP). In the Least concern category (LC) 155 taxa were counted, Near threatened (NT) with four, Vulnerable (V) seven and Endangered (EN) again seven. **Implications.** A renewed listing of alien, native, woody and semi-woody species from dry and semi-humid forests of the APFFMC, is crucial for its contribution to a proper management and decision taking in the ANP. 94 taxa names were updated. At family level, the inclusion of Sterculiaceae into Malvaceae was the most significant change. **Conclusions.** The taxonomic richness concentrated inside the APFFMC, whose surface is inferior to 1% of the state, oscillates

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between 10.41 and 13.93% of the species; 19.95 and 22.80 % of the genera and 29.70 and 30% of the families reported in the state of Sinaloa, Mexico.

Key words: fabaceae; floristic listing; life forms; natural protected areas; taxonomical richness.

RESUMEN

Antecedentes. Los catálogos de plantas son básicos para proponer y manejar áreas naturales protegidas. A través de los censos se elaboran planes, estrategias de conservación y hacen comparaciones a través del tiempo. En bosques tropicales la actualización de levantamientos florísticos es urgente por las amenazas en su biodiversidad. **Objetivo.** Presentar un listado estructurado por familia, género y especie, que cuantifique las relaciones jerárquicas de géneros-especies y familias-géneros y estructure formas de vida e incluya especies con estatus de riesgo de extinción registradas en la legislación nacional (NOM-059 SEMARNAT 2010) e internacional (Lista Roja UICN) de plantas leñosas y semi leñosas de los bosques secos y semi húmedos del Área de Protección de Flora y Fauna Meseta de Cacaxtla, Sinaloa, México (APFFMC). **Metodología.** Se revisaron los trabajos publicados para el sitio, seleccionando las especies autóctonas con crecimiento secundario, excluyendo invasoras, naturalizadas, cultivadas, ornamentales, etc., cotejando en páginas virtuales, bibliografía especializada y consultando a especialistas. Para la nomenclatura se emplearon diferentes fuentes de información y bases de datos. A través de recorridos en campo, se corroboró presencia de taxones e incluyeron nuevos registros. El listado se ordenó de manera alfabética. **Resultados.** Fueron registradas 60 familias, 223 géneros y 389 especies. Fabaceae fue la familia con mayor riqueza de taxones, con 44 géneros y 75 especies, seguida por Malvaceae (19/31), Euphorbiaceae (12/34), Asteraceae (10/17), Cactaceae (9/21) y Apocynaceae (8/10). Un bajo número de 13 géneros y de 12 familias agruparon cinco o más especies y géneros respectivamente. Por el contrario, una alta cantidad de 210 géneros y 48 familias presentaron cuatro o menos taxones. Los géneros más diversos fueron *Croton* (12 especies), *Bursera* (8), *Solanum* (7), *Ficus* y *Randia* (6); *Opuntia*, *Merremia*, *Euphorbia*, *Lonchocarpus*, *Mimosa*, *Senna*, *Jatropha* y *Sideroxylon* (5). La categoría árbol agrupó 146 especies, arbusto (114), subarbusto (54), trepadora (51), suculenta y semi suculenta (21) y parásita (3). De acuerdo con el listado de especies en riesgo de la NOM 059 SEMARNAT-2010, fueron incluidas cinco especies en la categoría de Amenazadas (A) y dos Sujetas a protección especial (Pr). La lista roja (UICN) incluyó 173 especies reportadas para el ANP. En la categoría Menor Preocupación (Least Concern) se registraron 155 taxones, Casi Amenazada (Near Threatened) cuatro, Vulnerable (Vulnerable) siete y en Peligro de Extinción (Endangered) siete. **Implicaciones.** Un listado actualizado de las especies silvestres, nativas, leñosas y semileñosas de los bosques secos y semihúmedos del APFFMC, es crucial para contribuir en la correcta gestión y toma de decisiones en la ANP. Fueron actualizados los nombres de 94 taxones. A nivel familia la inclusión de taxones de Sterculiaceae en Malvaceae fue el cambio más significativo. **Conclusiones.** La riqueza taxonómica que concentra el APFFMC, cuya superficie es inferior al 1 % del estado, oscila entre 10.41 y 13.93 % de las especies; 19.95 y 22.80 % de géneros, y 29.70 y 30 % de las familias reportadas para el estado de Sinaloa, México.

Palabras clave: áreas naturales protegidas; fabaceae; formas de vida; listado florístico; riqueza taxonómica.

INTRODUCTION

Plant listings characterize and concentrate current information from a determined place and particular time. The censuses gather useful data to monitor the changes throughout time (Gillson *et al.*, 2020) in the different flora categories. The floristic catalogues represent a vital summary of the collected or previously known information regarding plant species, or other taxonomical categories, from a region (Nimis, 1996). They are the result of a long process that consists of an exhaustive botanical exploration, herbarium work, a wide virtual and bibliographical research, networks with specialist taxonomists and the publication of results. Floristic researches pretend to register with the highest precision the taxa from a specific area, which across published studies indicate the floristic richness of families, genders, species, their life-forms and conservation status as

part of the natural heritage, present in any geographic unit or administrative, like a country (Villaseñor *et al.*, 2016), region or specific area.

Among Natural Protected Areas (ANP) the catalogues are crucial for its ordinance. They are used to plan the conservation efforts at a major scale (Phillips *et al.*, 2003), as well at a medium and small scale; due to being helpful at developing plans and conservation programs which are used to collate listings considering national and international norms, where native taxa can appear in different risk categories, similarly at verifying alien species censuses we can find invasive and exotic taxa, along with species with few registers (rare and low abundance), for which is required to establish a plan including clear strategies to face biodiversity threats. The principal axis of planning is constituted by biodiversity use and conservation actions, with the goal of shielding the most

diversity and endemism possible (Pennington, 2012). Therefore, there is a close relation between species listing and conservation planning.

Inside dry forest families such as Fabaceae, Bignoniaceae, Malvaceae, Apocynaceae, Capparaceae, Euphorbiaceae, Hippocrateaceae, Mimosaceae, Rubiaceae, Cactaceae, Bignoniaceae and Annonaceae dominate (Murphy y Lugo, 1986; Narváez-Espinoza *et al.*, 2015; Ferrufino-Acosta *et al.*, 2019; Romero-Duque *et al.*, 2019); while genera such as *Bursera*, *Caesalpinia* and *Randia* being considered the most diverse (Márquez-Salazar *et al.*, 2019). Regarding life-forms, tree-like species obtaining the most records, following with shrubs and vines (Cedeño-Fonseca *et al.*, 2020); the quantity of sub-shrubs is inferior to shrubs but superior to vines (Angel *et al.*, 2017).

This present study aims to build a floristic listing in dry and semi-humid forest from the Area de Protección de Flora y Fauna Meseta de Cacaxtla (APFFMC), Sinaloa, which concentrates the taxonomical richness of families, genera and species including the updated names of woody plants, semi-woody, native and wild, along with the life-forms, thus contributing to the knowledge of vascular plants from the ANP across the state of Sinaloa. For said purpose, bibliographies of the Instituto Nacional de Ecología, Secretaría del Medio Ambiente, Recursos Naturales y Pesca, y Gobierno del Estado de Sinaloa (1998), Secretaría del Medio Ambiente Recursos Naturales (2016), Márquez-Salazar *et al.* (2019), van der Heiden *et al.* (2019) were reviewed and the records of the authors were included. To homogenize the listings nomenclature, the synonyms of the current proposed names were considered, field routes were drawn along the outskirts of roads, pathways, and towns, as well as into dry and semi-humid forests. The familiar species were identified and recorded in situ, the dubious or unrecognized species were collected, employing herbarium collections (Díaz, 2007). For the nomenclature, the taxonomic system APG III 2011 was utilized, and confirmed with The Plant List database (<http://www.theplantlist.org/>), TROPICOS del Missouri Botanical Garden (<http://www.tropicos.org/>), ILDIS (International Legume Database and Information Service) (<https://ildis.org/LegumeWeb10.01.shtml>), World Flora Online (<http://www.worldfloraonline.org/>), The International Compositae Alliance (TICA). (<https://www.compositae.org/aphia.php?p=stats>): for some genera Gagnon *et al.* (2016), Korotkova *et al.* (2017) and Estrada (2019). The geographic distribution was corroborated through the online site Global Biodiversity Information Facility (<https://www.gbif.org/>). To confirm the inclusion

of native taxa Villaseñor (2004) was verified. The records of domesticated (crops, fruit trees and ornamental) and naturalized species were eliminated. Fully unidentified species were excluded and the subspecies weren't added. Relating to the genus-specie and families-genera link, these were structured into classes. Quantifying from the obtained listing the genera with a single species and families with one, two or three genera, subsequently until reaching the category with the highest richness of taxa. For the growth forms, the criteria of León *et al.* (2012) was modified, incorporating bushes or sub-shrubs (Díaz, 2008; Rodríguez *et al.*, 2012), combining life-forms (Nivia y Cascante, 2008), excluding the habit. Considering the following categories: tree (Ar), shrub (Ab), sub-shrub (Su), vines (Tr), parasitic (Pa) and succulent (Sc). The climbing shrubs were included as shrubs. For the endangered species the NOM 059-SEMARNAT 2010 (SEMARNAT 2019) was consulted. The Mexican legislation includes the next categories from lowest to highest concern: Protección especial (Pr), Amenazado (A), En Peligro de extinción (P), and Probablemente extinta en el medio silvestre (E), and the red list (IUCN). The international legislation contains these categories: Not evaluated, Data deficient, Least concern, Near threatened, Vulnerable, Endangered, Critically endangered, Extinct in the wild and Extinct (<https://www.iucnredlist.org>).

THREATS TO DRY FORESTS IN SINALOA

The dry forests are the most threatened tropical ecosystems of the world (Janzen, 1988), around 80% of their actual coverage has disappeared, while the causal anthropogenic processes continue, presenting high levels of fragmentation (Sánchez-Azofeifa *et al.*, 2014) and increasing the deforested surface. Particularly in northwest Mexico, the dry forests along the northwestern coastal plain of Sonora and Sinaloa have become fragmented since the 1940's throughout the 1950's (Rzedowski, 1978), turning dry forests and shrubland into farming, ranching land and in recent decades shrimp farming. Ruiz-Guerrero *et al.* (2015), stating the threats, they mention that during centuries, the vegetation and flora from southern Sinaloa was severely impacted, without regulation from human activities, by the agricultural slash-and-burn system (RTQ), extensive ranching, local logging and deforestation for coal production. From 1993 until 2011 (18 years), the San Ignacio municipality lost 174.41 km² of deciduous tropical forest alone and the Mazatlán municipality lost 101.54 km². The average deforestation rate of this forest in Sinaloa was of 126.50 km²/per year

(Monjardín-Armenta *et al.*, 2017); other biodiversity challenges in the ANP at southern Sinaloa are urbanization (Peraza-Durán, 2021) and the exotic species invasion, which modify the richness, biodiversity and structure of plant communities (Márquez-Salazar *et al.*, 2021). Due to the issues and threats to biodiversity in dry and semi-humid forest, the APFFMC decree (Secretaría de Gobernación, 2000) was an appropriate conservation policy, justified due being located inside the dry forests from the Mexican Pacific, which are plant communities with the highest conservation priorities at an international level (SEMARNAT, 2016). The registration of species in tropical forest must be a permanent activity (Raven, 1988); the challenge maximizes when the existing problematic in tropical dry forests in the state is acknowledged. A complete plant listing is vital to protect endangered species from all classes of organisms, before many of them go extinct.

DESCRIPTION OF STUDY AREA

The APFFMC is situated in the coastal zone of the San Ignacio municipality (central-west and southeast) and Mazatlán (northeast), in the southern region of Sinaloa, delimited by the outmost coordinates 106° 35' 10" and 106° 45' 30" west ; 23° 32' 00" and 23° 46' 00" north) between the low basin of Piaxtla river (left bank) and the Quelite river (right bank) with an extension of 50, 862-31-25 ha (Figure 1). It holds 0.874 % of the total state surface. It retains an elevation gradient of 0 to 360 meters above sea level (msnm). It has a semi-dry or semi-arid climate. In the

climate station at Estación Dimas (20 m) the climate classification is: BSo (h') w (w) (i'), which corresponds to the "driest of the semi-arids" climate, the average annual temperature is 24.9°C, it is hot, with little thermal oscillation and a median annual precipitation of 482.8 mm, concentrated during the months of July to October (García, 2004). The dominant types of soils are: Lithosol, Regosol and Vertisol according to the FAO/UNESCO classification (INEGI, 1988). In the ANP converge contrasting types of vegetation (by the criteria of Rzedowski, 1978); Plant communities from humid and dry regions are located, by their biogeographic pattern, continuous and discontinuous. Aquatic with sub-aquatic vegetation (mangroves) and tropical deciduous forest form continuous stripes parallel to the coastal zone. The thorny and the tropical sub-deciduous forest are presented in separated fragments. Dispersed areas of secondary vegetation are also located.

TAXONOMICAL RICHNESS OF THE APFFMC

The taxonomic categories of dry and semi-humid forests from the Área de Protección de Flora y Fauna Meseta de Cacaxtla were 60 families, 223 genera and 389 species. In contributions to the census, The Instituto Nacional de Ecología *et al.* (1998) added 27 families, 61 genera and 72 species, SEMARNAT (2016) (47/165/221), Márquez-Salazar *et al.* (2019) (27/67/86), van der Heiden *et al.* (2019) (47/171/245) and the authors (53/175/246) respectively (Table 1).

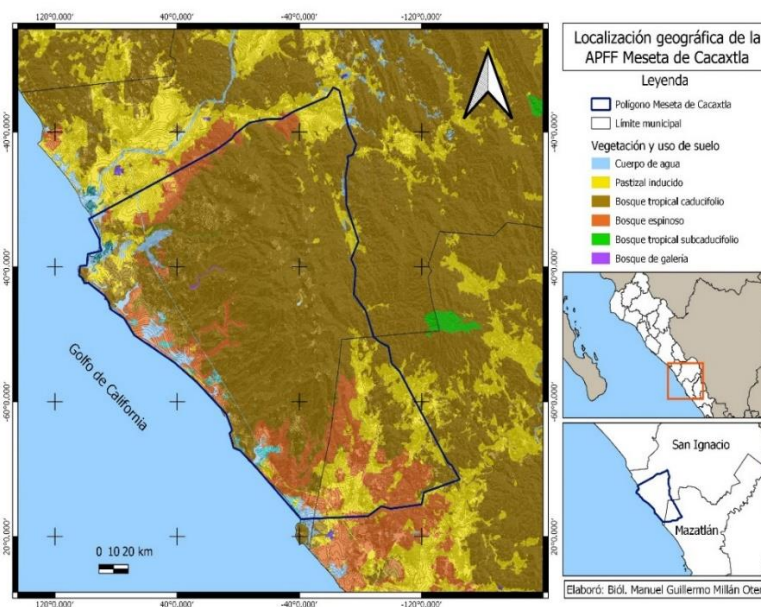


Figure 1. Geographical localization of the Área de Protección de Flora y Fauna Meseta de Cacaxtla.

Table 1. Woody and semi-woody plants listing from dry and semi-humid forests of the Área de Protección de Flora y Fauna Meseta de Cacaxtla.

Botanical family	Scientific name	Life-form	Risk category
Acanthaceae	<i>Carlowrightia arizonica</i> A. Gray ⁴	SU	
	<i>Henrya insularis</i> Nees ex Benth. ⁴	SU	
	<i>Justicia candicans</i> (Nees) L.D. Benson ^{2,4,5}	SH	
	<i>Justicia hilsenbeckii</i> T.F. Daniel ^{2,4}	SH	
	<i>Ruellia intermedia</i> Leonard ⁴	SU	
	<i>Ruellia inundata</i> Kunth ^{2,4}	SU	
	<i>Ruellia nudiflora</i> (Engelm. & A. Gray) Urb. ⁴	SU	
	<i>Tetramerium glandulosum</i> Oerst ⁴	SU	
	<i>Tetramerium nervosum</i> Nees ⁴	SU	
	<i>Tetramerium tenuissimum</i> Rose ^{2,4}	SU	
Achatocarpaceae	<i>Phaulothamnus spinescens</i> A. Gray ^{2,4,5}	SH	
Amaranthaceae	<i>Atriplex barclayana</i> (Benth.) D.Dietr. ^{1,4}	SU	
	<i>Suaeda vermiculata</i> Forssk. ex J.F. Gmel. ²	SU	
	<i>Suaeda ramosissima</i> (Standl.) I.M. Johnst. ²	SU	
Anacardiaceae	<i>Rhus terebinthifolia</i> Schlttdl. & Cham. ^{1,5}	TR	LC
	<i>Spondias purpurea</i> L. ^{1,5}	TR	LC
Apocynaceae	<i>Asclepias curassavica</i> L. ⁵	SU	
	<i>Cascabela ovata</i> (Cav.) Lippold ^{2,4,5}	SH	LC
	<i>Marsdenia coulteri</i> Hemsl. ²	VI	
	<i>Marsdenia edulis</i> S. Watson ^{3,4,5}	VI	
	<i>Matelea chrysantha</i> (Greenm.) Woodson ^{2,5}	VI	
	<i>Plumeria rubra</i> L. ^{1,2,3,4,5}	TR	LC
	<i>Rauvolfia tetraphylla</i> L. ^{2,4}	SH	
	<i>Tabernaemontana amygdalifolia</i> Jacq. ^{1,2,5}	TR	LC
	<i>Tabernaemontana tomentosa</i> (Greenm.) A.O. Simões & M.E. Endress ^{2,4}	TR	LC
	<i>Vallesia glabra</i> (Cav.) Link ^{1,2,4,5}	SH	LC
	Asteraceae	<i>Ambrosia ambrosioides</i> (Cav.) W.W. Payne ^{2,4,5}	SH
<i>Ambrosia confertiflora</i> DC. ⁴		SH	
<i>Ambrosia monogyra</i> (Torr. & A. Gray) Strother & B.G. Baldwin ^{2,5}		SH	
<i>Ambrosia psilostachya</i> DC. ²		SH	
<i>Baccharis salicina</i> Torr. & A. Gray ^{1,2,4,5}		SH	
<i>Baccharis sarothroides</i> A. Gray ²		SH	
<i>Baccharis thesioides</i> Kunth ²		SH	
<i>Brickellia coulteri</i> A. Gray ²		SH	
<i>Brickellia subuligera</i> (Schauer) B.L. Turner ⁴		SH	
<i>Chromolaena sagittata</i> (A. Gray) R.M. King & H. Rob. ^{2,4}		SH	
<i>Critonia quadrangularis</i> (DC.) R.M. King & H. Rob. ²		SH	
<i>Koanophyllon albicaulis</i> (Sch.Bip. ex Klatt) R.M. King & H. Rob. ^{1,4}		SH	
<i>Lagascea decipiens</i> Hemsl. ^{2,4}		SH	
<i>Parthenium hysterophorus</i> L. ⁵		SH	
<i>Pluchea carolinensis</i> (Jacq.) G. Don ⁴		SH	LC
<i>Pluchea odorata</i> (L.) Cass. ⁵		SH	
<i>Porophyllum punctatum</i> (Mill.) S.F. Blake ^{4,5}		SH	
Bataceae		<i>Batis maritima</i> L. ^{1,2,4}	SU
Bignoniaceae	<i>Adenocalymma inundatum</i> Mart. ex DC. ^{2,4}	VI	
	<i>Amphilophium paniculatum</i> (L.) Kunth ^{2,4,5}	VI	
	<i>Crescentia alata</i> Kunth ^{1,2,4,5}	TR	LC
	<i>Dolichandra unguis-cati</i> (L.) L.G. Lohmann ^{2,3,4,5}	VI	

Botanical family	Scientific name	Life-form	Risk category
	<i>Handroanthus chrysanthus</i> (Jacq.) S.O. Grose ^{2,4,5}	TR	A
	<i>Handroanthus impetiginosus</i> (Mart. ex DC.) Mattos ^{1,3,4,5}	TR	A. LC
	<i>Parmentiera aculeata</i> (Kunth) Seem ^{2,4}	TR	LC
Bixaceae	<i>Tecoma stans</i> (L.) Juss. ex Kunth ^{2,4,5}	SH	LC
Boraginaceae	<i>Cochlospermum vitifolium</i> (Willd.) Spreng. ^{2,5}	TR	LC
	<i>Bourreria rekoii</i> Standl. ²	TR	
	<i>Cordia alliodora</i> (Ruiz & Pav.) Oken ^{2,4,5}	TR	LC
	<i>Cordia sonorae</i> N.E. Rose ^{1,2,3,4,5}	TR	
	<i>Tournefortia capitata</i> M. Martens & Galeotti ²	SH	
	<i>Tournefortia hartwegiana</i> Steud ⁵	SH	
	<i>Tournefortia mutabilis</i> Vent. ⁵	SH	
	<i>Tournefortia volubilis</i> L. ²	SH	
	<i>Varronia curassavica</i> Jacq. ²	SH	
Burseraceae	<i>Varronia macrocephala</i> Desv. ^{2,5}	SH	
	<i>Bursera arborea</i> (Rose) L. Riley ^{4,5}	TR	NT
	<i>Bursera excelsa</i> (Kunth) Engl. ^{3,4,5}	TR	LC
	<i>Bursera fagaroides</i> (Kunth) Engl. ^{1,2,3,4,5}	TR	LC
	<i>Bursera grandifolia</i> (Schltdl.) Engl. ^{1,2,3,5}	TR	LC
	<i>Bursera laxiflora</i> S. Watson ^{1,3,4,5}	TR	NT
	<i>Bursera palmeri</i> S. Watson ⁴	TR	LC
	<i>Bursera penicillata</i> (Sessé & Moc. ex DC.) Engl. ^{2,3,5}	TR	LC
	<i>Bursera simaruba</i> (L.) Sarg. ^{2,3,4,5}	TR	LC
Cactaceae	<i>Acanthocereus tetragonus</i> (L.) Hummelinck ^{2,3,4,5}	SC	LC
	<i>Acanthocereus rosei</i> (J.G. Ortega) Lodé ^{2,4}	SC	VU*
	<i>Cylindropuntia fulgida</i> (Engelm.) F.M. Knuth ^{1,2,4}	SC	LC
	<i>Cylindropuntia thurberi</i> (Engelm.) F.M. Knuth ^{2,3,4,5}	SC	LC
	<i>Mammillaria beneckeii</i> Ehrenb. ⁵	SC	LC
	<i>Mammillaria bocensis</i> R.T. Craig ⁵	SC	VU
	<i>Mammillaria mazatlanensis</i> K. Schum. ^{2,4,5}	SC	LC
	<i>Opuntia decumbens</i> Salm-Dyck ^{1,2,3,4,5}	SC	LC
	<i>Opuntia karwinskiana</i> Salm-Dyck ^{2,3,5}	SC	
	<i>Opuntia rileyi</i> J. G. Ortega ^{2,4}	SC	
	<i>Opuntia spraguei</i> J. G. Ortega ⁵	SC	
	<i>Opuntia wilcoxii</i> Britton & Rose ^{1,4}	SC	LC
	<i>Pachycereus pecten-aboriginum</i> (Engelm. ex S. Watson) Britton & Rose ^{1,2,3,4,5}	SC	LC
	<i>Pereskiaopsis blakeana</i> J.G. Ortega ⁵	SC	LC
	<i>Pereskiaopsis porteri</i> (Brandege ex F.A.C. Weber) Britton & Rose ^{2,3,4,5}	SC	LC
	<i>Pilosocereus purpusii</i> (Britton & Rose) Byles & G.D. Rowley ^{2,3,4,5}	SC	LC
	<i>Selenicereus vagans</i> (K. Brandege) Britton & Rose ^{4,5}	SC	LC
	<i>Stenocereus alamosensis</i> (J.M. Coult.) A.C. Gibson & K.E. Horak ^{1,2,3,4,5}	SC	VU
	<i>Stenocereus kerberi</i> (K. Schum.) A.C. Gibson & K.E. Horak ^{2,5}	SC	LC
	<i>Stenocereus martinezii</i> (J. G. Ortega) Buxb. ^{2,3,4,5}	SC	Pr. EN
	<i>Stenocereus standleyi</i> (J.G. Ortega) Buxb. ^{3,4,5}	SC	LC
Cannabaceae	<i>Celtis iguanaea</i> (Jacq.) Sarg ^{1,2}	TR	LC
	<i>Celtis pallida</i> Torr. ^{1,2,5}	TR	LC

Botanical family	Scientific name	Life-form	Risk category	
Capparaceae	<i>Trema micrantha</i> (L.) Blume ⁵	TR	LC	
	<i>Crateva palmeri</i> Rose ²	TR	LC	
	<i>Crateva tapia</i> L. ^{2,3,4,5}	TR	LC	
	<i>Cynophalla flexuosa</i> (L.) J. Presl ^{2,3,4,5}	SH	LC	
	<i>Cynophalla verrucosa</i> (Jacq.) J. Presl ^{2,4,5}	SH	LC	
	<i>Morisonia americana</i> L. ^{1,2,3,4,5}	TR	LC	
Celastraceae	<i>Quadrella indica</i> (L.) Iltis & Cornejo ^{2,3,4,5}	TR	LC	
	<i>Maytenus phyllanthoides</i> Benth. ^{2,5}	TR	LC	
	<i>Pristimera celastroides</i> (Kunth) A.C.Sm. ^{3,4,5}	VI		
Cleomaceae	<i>Semialarium mexicanum</i> (Miers) Mennega ⁵	SH	LC	
	<i>Cleome viscosa</i> L. ⁴	SU		
Combretaceae	<i>Combretum fruticosum</i> (Loefl.) Stuntz ^{2,3,4,5}	VI		
Convolvulaceae	<i>Conocarpus erectus</i> L. ^{1,2,4,5}	TR	A. LC	
	<i>Ipomoea arborescens</i> (Humb. & Bonpl. ex Willd.) G. Don ^{1,2,3,4,5}	TR	LC	
	<i>Ipomoea bracteata</i> Cav. ^{2,3,4,5}	VI		
	<i>Jacquemontia pentanthos</i> (Jacq.) G. Don ⁴	VI		
	<i>Jacquemontia polyantha</i> (Schltdl. & Cham.) Hallier ⁴	VI		
	<i>Merremia aegyptia</i> (L.) Urb. ^{4,5}	VI		
	<i>Merremia dissecta</i> (Jacq.) Hallier f. ²	VI		
	<i>Merremia palmeri</i> (Hallier) Hallier f. ²	VI		
	<i>Merremia quinquefolia</i> (L.) Hallier f. ⁴	VI		
	<i>Merremia umbellata</i> (L.) Hallier f. ^{4,5}	VI		
	<i>Operculina pinnatifida</i> (Kunth) O'Donell ^{4,5}	VI		
	<i>Operculina pteripes</i> (G. Don) O'Donell ⁴	VI		
	Ebenaceae	<i>Diospyros aequoris</i> Standl. ^{3,5}	TR	
		<i>Diospyros sphaerantha</i> Standl. ²	TR	
	Erythroxylaceae	<i>Erythroxylum havanense</i> Jacq. ⁴	TR	LC
		<i>Erythroxylum mexicanum</i> Kunth ^{2,3,5}	TR	
	Euphorbiaceae	<i>Acalypha californica</i> Benth. ⁵	SU	
<i>Acalypha microphylla</i> Klotzsch ^{4,5}		SU		
<i>Adelia vaseyi</i> (J.M. Coult.) Pax & K. Hoffm. ⁵		SH		
<i>Cnidocolus sinaloensis</i> Breckon ex Fern.Casas ^{2,3,4,5}		TR	EN	
<i>Croton alamosanus</i> Rose ^{2,3,4,5}		SH		
<i>Croton californicus</i> Müll.Arg. ^{2,4}		SH		
<i>Croton ciliatoglandulifer</i> Ortega ^{2,4,5}		SH		
<i>Croton fantzianus</i> F. Seym. ²		SH		
<i>Croton flavescens</i> Greenm. ^{4,5}		SH		
<i>Croton fragilis</i> Kunth ^{2,5}		SH		
<i>Croton jucundus</i> Brandegee ¹		SH		
<i>Croton morifolius</i> Willd. ¹		SH		
<i>Croton pseudoniveus</i> Lundell ⁵		SH	LC	
<i>Croton reflexifolius</i> Kunth ¹		SH	LC	
<i>Croton rhamnifolius</i> Willd. ¹		SH		
<i>Croton roxanae</i> Croizat ⁵		SH		
<i>Dalechampia scandens</i> L. ^{2,4,5}		VI	LC	
<i>Euphorbia bracteata</i> Jacq. ^{2,4}		SH		
<i>Euphorbia californica</i> Benth. ^{3,4,5}		SH		
<i>Euphorbia cymosa</i> Poir. ^{4,5}		SU		
<i>Euphorbia lomelii</i> V.W. Steinm. ^{2,3,5}		SH		
<i>Euphorbia schlechtendalii</i> Boiss. ^{3,5}		TR		
<i>Hippomane mancinella</i> L. ⁴		TR	LC	
<i>Hura polyandra</i> Baill. ^{1,2,4,5}	TR	LC		
<i>Jatropha</i> cf. <i>bullockii</i> E.J. Lott ^{3,5}	SH	EN		
<i>Jatropha cordata</i> (Ortega) Müll.Arg. ^{2,3,4,5}	TR			

Botanical family	Scientific name	Life-form	Risk category
Fabaceae	<i>Jatropha curcas</i> L. ^{1,3,4,5}	TR	LC
	<i>Jatropha gossypifolia</i> L. ²	TR	LC
	<i>Jatropha peltata</i> Sessé ^{4,5}	TR	
	<i>Manihot aesculifolia</i> (Kunth) Pohl ^{2,4,5}	SH	LC
	<i>Manihot chlorosticta</i> Standl. & Goldman ^{2,4}	SH	NT
	<i>Manihot rubricaulis</i> I.M. Johnst ^{3,5}	SH	NT
	<i>Sapium lateriflorum</i> Hemsl. ^{2,4,5}	TR	LC
	<i>Sebastiania pavoniana</i> (Müll. Arg.) Müll. Arg ⁴	TR	LC
	<i>Acacia riparia</i> Kunth ⁵	TR	LC
	<i>Acaciella tequilana</i> (S. Watson) Britton & Rose ²	SH	
	<i>Bauhinia pauletia</i> Pers. ^{2,4,5}	TR	LC
	<i>Bauhinia pringlei</i> S. Watson ^{3,5}	TR	
	<i>Brongniartia alamosana</i> Rydb. ^{4,5}	TR	
	<i>Brongniartia glabrata</i> Hook. & Arn ⁵	TR	
	<i>Caesalpinia cacalaco</i> Humb. & Bonpl. ^{1,2,3,4,5}	TR	
	<i>Caesalpinia palmeri</i> S. Watson ^{3,4,5}	SH	
	<i>Caesalpinia pulcherrima</i> (L.) Sw. ^{2,4,5}	SH	LC
	<i>Calliandra houstoniana</i> (Mill.) Standl. ⁵	SH	LC
	<i>Calliandra tergemina</i> (L.) Benth. ⁵	SH	LC
	<i>Canavalia rosea</i> (Sw.) DC. ^{1,2,4}	VI	
	<i>Canavalia villosa</i> Benth. ^{2,5}	VI	
	<i>Cenostigma eriostachys</i> (Benth.) E. Gagnon & G. P. Lewis ^{1,2,3,4,5}	TR	
	<i>Chloroleucon mangense</i> (Jacq.) Britton & Rose ^{1,2,3,4,5}	TR	LC
	<i>Conzattia multiflora</i> (Robinson) Standl. ^{1,2,3,4,5}	TR	
	<i>Coulteria platyloba</i> (S. Watson) N. Zamora ^{1,3,4,5}	TR	
	<i>Coursetia caribaea</i> (Jacq.) Lavin ⁴	SH	LC
	<i>Coursetia glandulosa</i> A. Gray ^{2,3,5}	SH	LC
	<i>Crotalaria incana</i> L. ^{2,4}	SU	
	<i>Crotalaria pumila</i> Ortega ^{2,4,5}	SU	LC
	<i>Desmanthus bicornutus</i> S. Watson ⁴	SH	
	<i>Desmanthus covillei</i> (Britton & Rose) Wiggins ⁴	SH	
	<i>Diphysa occidentalis</i> Rose ^{4,5}	SH	LC
	<i>Ebenopsis caesalpinoides</i> (Standl.) Britton & Rose ^{2,4,5}	TR	
	<i>Entada polystachya</i> (L.) DC. ^{4,5}	VI	LC
	<i>Enterolobium cyclocarpum</i> (Jacq.) Griseb. ^{1,2,4,5}	TR	LC
	<i>Erythrina lanata</i> Rose ^{1,3,4,5}	TR	
	<i>Erythrina flabelliformis</i> Kearney ^{1,5}	TR	LC
	<i>Eysenhardtia polystachya</i> (Ortega) Sarg ^{4,5}	TR	LC
	<i>Galactia acapulcensis</i> Rose ⁴	VI	
	<i>Galactia incana</i> (Rose) Standl. ⁵	VI	
	<i>Guilandina bonduc</i> L. ^{4,5}	SH	LC
<i>Haematoxylum brasiletto</i> H. Karst. ^{1,2,3,4,5}	TR	LC	
<i>Havardia sonorae</i> (S. Watson) Britton & Rose ^{1,2}	TR		
<i>Hesperalbizia occidentalis</i> (Brandege) Barneby & J.W. Grimes ^{1,2,3,4,5}	TR	A	
<i>Indigofera suffruticosa</i> Mill. ^{2,4}	SH		
<i>Inga vera</i> Willd ^{2,4}	TR	LC	
<i>Leucaena lanceolata</i> S. Watson ^{4,5}	TR	LC	
<i>Leucaena leucocephala</i> (Lam.) de Wit ^{1,2,4}	TR		
<i>Libidibia sclerocarpa</i> (Standl.) Britton & Rose ^{1,2,3,4,5}	TR		
<i>Lonchocarpus hermannii</i> M. Sousa ^{2,4,5}	TR		
<i>Lonchocarpus guatemalensis</i> Benth ^{3,4,5}	TR	LC	
<i>Lonchocarpus lanceolatus</i> Benth. ^{1,5}	TR	LC	

Botanical family	Scientific name	Life-form	Risk category
	<i>Lonchocarpus mutans</i> M. Sousa ^{2,4}	TR	LC
	<i>Lonchocarpus sericeus</i> (Poir.) DC. ⁵	TR	LC
	<i>Lysiloma divaricatum</i> (Jacq.) J.F. Macbr. ^{1,2,3,4,5}	TR	LC
	<i>Lysiloma microphylla</i> Benth. ²	TR	
	<i>Macroptilium gracile</i> (Benth.) Urb ⁴	VI	
	<i>Mariosousa russelliana</i> (Britton & Rose) Seigler & Ebinger ⁴	TR	
	<i>Microlobius foetidus</i> (Jacq.) M.Sousa & G. Andrade ^{2,4,5}	SH	
	<i>Mimosa palmeri</i> Rose ⁵	SH	
	<i>Mimosa pigra</i> L. ^{2,4}	SH	LC
	<i>Mimosa polyantha</i> Benth. ^{2,3,5}	SH	LC
	<i>Mimosa quadrivalvis</i> L. ⁴	SH	LC
	<i>Mimosa spirocarpa</i> Rose ⁴	SH	
	<i>Nissolia fruticosa</i> Jacq. ^{4,5}	VI	
	<i>Parkinsonia aculeata</i> L. ^{2,4,5}	TR	LC
	<i>Parkinsonia praecox</i> (Ruiz & Pav.) Hawkins ⁵	TR	LC
	<i>Pithecellobium dulce</i> (Roxb.) Benth. ^{1,2,3,4,5}	TR	LC
	<i>Pithecellobium lanceolatum</i> (Willd.) Benth. ^{2,4,5}	TR	LC
	<i>Pithecellobium unguis-cati</i> (L.) Benth. ^{2,4,5}	TR	LC
	<i>Poincianella eriostachys</i> (Benth.) Britton & Rose ^{1,2,3,4,5}	TR	
	<i>Prosopis juliflora</i> (Sw.) DC. ^{1,2,4,5}	TR	
	<i>Senna atomaria</i> (L.) H.S. Irwin & Barneby ^{2,3,4,5}	TR	LC
	<i>Senna fruticosa</i> (Mill.) H.S. Irwin & Barneby ^{2,4}	SH	LC
	<i>Senna occidentalis</i> (L.) Link ^{2,4,5}	SH	
	<i>Senna pallida</i> (Vahl) H.S. Irwin & Barneby ^{1,2,3,4,5}	SH	LC
	<i>Senna uniflora</i> (Mill.) H.S. Irwin & Barneby ⁴	SH	
	<i>Sesbania herbacea</i> (Mill.) McVaugh ^{2,4,5}	SH	
	<i>Vachellia campechiana</i> (Mill.) Seigler & Ebinger ^{1,2,3,4,5}	SH	
	<i>Vachellia farnesiana</i> (L.) Wight & Arn. ^{1,2,3,4,5}	SH	LC
	<i>Vachellia macracantha</i> (Humb. & Bonpl. ex Willd.) Seigler & Ebinger ¹	TR	LC
	<i>Zapoteca formosa</i> (Kunth) H.M. Hern. ⁴	SU	LC
	<i>Zapoteca media</i> (M. Martens & Galeotti) H.M. Hern ²	SU	
Fouquieriaceae	<i>Fouquieria macdougallii</i> Nash ⁵	TR	LC
Hernandiaceae	<i>Gyrocarpus jatrophifolius</i> Domin ^{4,5}	TR	LC
Lamiaceae	<i>Condea albida</i> (Kunth) Harley & J.F.B. Pastore ⁵	SH	LC
	<i>Hyptis suaveolens</i> (L.) Poit. ⁴	SH	
	<i>Salvia mazatlanensis</i> Fernald ⁵	SH	
Loranthaceae	<i>Psittacanthus palmeri</i> (S. Watson) Barlow & Wiens ²	PA	
Malpighiaceae	<i>Bunchosia biocellata</i> Schltld. ⁴	SH	LC
	<i>Bunchosia palmeri</i> S. Watson ^{2,5}	SH	
	<i>Byrsonima crassifolia</i> (L.) Kunth ⁴	TR	LC
	<i>Callaeum macropterum</i> (DC.) D.M. Johnson ^{4,5}	VI	
	<i>Heteropterys palmeri</i> Rose ⁴	VI	
	<i>Malpighia emarginata</i> DC. ^{2,3,4,5}	TR	
	<i>Mascagnia macroptera</i> (Moc. & Sessé ex DC.) Nied. ^{2,5}	VI	
Malvaceae	<i>Abutilon abutiloides</i> (Jacq.) Garcke ex Hochr. ^{4,5}	SU	
	<i>Abutilon grandidentatum</i> Fryxell ²	SU	EN

Botanical family	Scientific name	Life-form	Risk category
	<i>Abutilon trisulcatum</i> (Jacq.) Urb. ^{2,4,5}	SU	
	<i>Anoda acerifolia</i> Cav. ^{2,4}	SU	
	<i>Anoda cristata</i> (L.) Schltld. ^{2,5}	SU	
	<i>Ayenia pusilla</i> L. ⁵	SU	
	<i>Byttneria aculeata</i> Jacq. ^{2,3,4,5}	VI	
	<i>Ceiba aesculifolia</i> (Kunth) Britten & Baker f. ^{1,2,3,4,5}	TR	LC
	<i>Corchorus aestuans</i> L. ⁵	SU	
	<i>Corchorus hirtus</i> L. ⁴	SU	
	<i>Corchorus olitorius</i> L. ⁴	SU	
	<i>Gossypium aridum</i> (Rose & Standl.) Skovst. ^{2,3,4,5}	TR	Pr.VU
	<i>Guazuma ulmifolia</i> Lam. ^{1,3,4,5}	TR	LC
	<i>Helicteres baruensis</i> Jacq. ^{2,3,4,5}	SH	LC
	<i>Helicteres vegae</i> Cristóbal ⁵	SH	
	<i>Herissantia crispa</i> (L.) Brizicky ^{2,5}	SU	
	<i>Hibiscus biseptus</i> S. Watson ^{2,5}	SU	
	<i>Hibiscus phoeniceus</i> Jacq. ⁴	SU	
	<i>Kosteletzkya depressa</i> (L.) O.J. Blanch., Fryxell & D.M. Bates ^{2,4,5}	SU	
	<i>Luehea candida</i> (Moc. & Sessé ex DC.) Mart. ^{2,5}	TR	LC
	<i>Malachra alceifolia</i> Jacq. ⁴	SU	
	<i>Malvastrum americanum</i> (L.) Torr. ⁴	SU	
	<i>Malvastrum coromandelianum</i> (L.) Garcke	SH	
	<i>Melochia pyramidata</i> L. ^{2,4,5}	SU	LC
	<i>Melochia speciosa</i> S. Watson ⁴	SU	
	<i>Melochia tomentosa</i> L. ^{2,4,5}	SU	
	<i>Sida acuta</i> Burm.F. ^{2,4,5}	SH	
	<i>Sida rhombifolia</i> L. ²	SU	
	<i>Triumfetta acracantha</i> Hochr ⁴	SU	
	<i>Triumfetta discolor</i> Rose ⁵	SU	
	<i>Waltheria indica</i> L. ^{2,4,5}	SU	
Meliaceae	<i>Cedrela odorata</i> L. ⁵	TR	VU
	<i>Swietenia humilis</i> Zucc. ^{1,2,4,5}	TR	EN
	<i>Trichilia americana</i> (Sessé & Moc.) T.D. Penn. ^{4,5}	TR	LC
	<i>Trichilia havanensis</i> Jacq. ⁵	TR	LC
	<i>Trichilia hirta</i> L. ⁵	TR	LC
	<i>Trichilia trifolia</i> L. ⁵	TR	LC
Menispermaceae	<i>Cissampelos pareira</i> L. ^{2,5}	VI	
	<i>Cocculus diversifolius</i> DC. ²	VI	
Moraceae	<i>Brosimum alicastrum</i> Sw. ^{1,2,4,5}	TR	
	<i>Ficus cotinifolia</i> Kunth ^{1,3,4,5}	TR	LC
	<i>Ficus insipida</i> Willd. ⁴	TR	LC
	<i>Ficus maxima</i> Mill. ^{1,2,4,5}	TR	LC
	<i>Ficus pertusa</i> L.f. ^{1,2}	TR	LC
	<i>Ficus petiolaris</i> Kunth ⁵	TR	
	<i>Ficus trigonata</i> L. ²	TR	LC
	<i>Maclura tinctoria</i> (L.) D. Don ex Steud. ^{1,2,3,4,5}	TR	LC
	<i>Trophis racemosa</i> (L.) Urb. ²	TR	LC
Myrsinaceae	<i>Ardisia revoluta</i> Kunth ⁵	TR	
Myrtaceae	<i>Eugenia inconspicua</i> Standl. ⁵	TR	
	<i>Eugenia guatemalensis</i> Donn.Sm. ¹	TR	
	<i>Eugenia sinaloae</i> Standl. ⁵	TR	
	<i>Psidium sartorianum</i> (O. Berg) Nied. ^{1,2,4,5}	TR	
Nyctaginaceae	<i>Boerhavia erecta</i> L. ⁵	SU	

Botanical family	Scientific name	Life-form	Risk category
	<i>Commicarpus scandens</i> (L.) Standl. ^{2,4,5}	SU	
	<i>Neea psychotrioides</i> Donn.Sm. ^{3,5}	TR	LC
	<i>Pisonia aculeata</i> L. ^{4,5}	SH	LC
	<i>Pisonia capitata</i> (S. Watson) Standl. ^{2,4}	TR	LC
	<i>Salpianthus macrodontus</i> Standl. ^{2,4}	SH	
	<i>Salpianthus purpurascens</i> (Cav. ex Lag.) Hook. & Arn. ^{2,4}	SH	
Onagraceae	<i>Ludwigia octovalvis</i> (Jacq.) P.H. Raven ⁴	SU	LC
Opiliaceae	<i>Agonandra racemosa</i> (DC.) Standl. ^{4,5}	TR	LC
Passifloraceae	<i>Passiflora arida</i> (Mast. & Rose) Killip ^{2,5}	VI	
	<i>Passiflora foetida</i> L. ²	VI	
	<i>Turnera diffusa</i> Willd. ex Schult. ^{3,4,5}	SH	
Petiveriaceae	<i>Petiveria alliacea</i> L. ^{2,4,5}	SU	
	<i>Rivina humilis</i> L. ⁴	SH	
Plantaginaceae	<i>Russelia sarmentosa</i> Jacq ⁴	SU	
Polygonaceae	<i>Antigonon leptopus</i> Hook. & Arn ^{2,4,5}	VI	
	<i>Coccoloba barbadensis</i> Jacq ^{4,5}	TR	LC
	<i>Coccoloba goldmanii</i> Standl. ^{2,4,5}	TR	
	<i>Ruprechtia fusca</i> Fernald ^{3,5}	TR	
Pricamniaceae	<i>Alvaradoa amorphoides</i> Liebm. ⁵	TR	LC
Primulaceae	<i>Bonellia macrocarpa</i> (Cav.) B. Ståhl & Källersjö ^{1,2,3,4,5}	TR	LC
Ranunculaceae	<i>Clematis dioica</i> L. ^{2,5}	VI	
Rhamnaceae	<i>Colubrina heteroneura</i> (Griseb.) Standl. ^{2,4,5}	TR	LC
	<i>Colubrina triflora</i> Brongn. ex Sweet ^{2,4,5}	TR	LC
	<i>Condalia mexicana</i> Schltld. ^{2,4,5}	SH	LC
	<i>Condalia spathulata</i> A. Gray ^{2,4}	SH	
	<i>Gouania lupuloides</i> (L.) Urb. ^{4,5}	VI	
	<i>Gouania rosei</i> Wiggins ^{2,5}	VI	
	<i>Karwinskia humboldtiana</i> (Schult.) Zucc. ^{1,2,3,4,5}	TR	LC
	<i>Karwinskia latifolia</i> Standl. ^{4,5}	TR	LC
	<i>Ziziphus amole</i> (Sessé & Moc.) M.C. Johnst ^{1,2,3,4,5}	TR	LC
Rubiaceae	<i>Chiococca alba</i> (L.) Hitchc. ^{3,5}	SH	LC
	<i>Hintonia latiflora</i> (Sessé & Moc. ex DC.) Bullock ^{1,2,3,4,5}	TR	LC
	<i>Randia aculeata</i> L. ^{1,2,4,5}	SH	LC
	<i>Randia armata</i> (Sw.) DC. ^{2,3,4,5}	SH	LC
	<i>Randia echinocarpa</i> Moc. & Sessé ex DC. ^{2,3,4,5}	SH	LC
	<i>Randia obcordata</i> S. Watson ^{2,3}	SH	LC
	<i>Randia laetevirens</i> Standl. ⁴	SH	LC
	<i>Randia thurberi</i> S. Watson ^{2,5}	SH	LC
Rutaceae	<i>Esenbeckia hartmanii</i> B.L. Rob. & Fernald ^{1,2,3,4,5}	TR	VU
	<i>Zanthoxylum arborescens</i> Rose ^{1,3,4,5}	TR	LC
	<i>Zanthoxylum caribaeum</i> Lam. ^{2,4,5}	TR	LC
	<i>Zanthoxylum fagara</i> (L.) Sarg. ^{2,3,4,5}	TR	LC
	<i>Zanthoxylum schreberi</i> (J.F. Gmel.) Reynel ex C. Nelson ⁵	TR	LC
Salicaceae	<i>Casearia arguta</i> Kunth ^{2,3,4,5}	TR	LC
	<i>Casearia nitida</i> (L.) Jacq ^{2,4,5}	TR	
Santalaceae	<i>Phoradendron bolleanum</i> (Seem.) Eichler ⁴	PA	
	<i>Phoradendron quadrangulare</i> (Kunth) Griseb ^{2,5}	PA	
Sapindaceae	<i>Cupania dentata</i> DC. ⁴	TR	
	<i>Paullinia fuscescens</i> Kunth ^{2,4}	VI	

Botanical family	Scientific name	Life-form	Risk category
	<i>Paullinia tomentosa</i> Jacq. ^{2,4,5}	VI	
	<i>Sapindus saponaria</i> L. ^{2,4}	TR	LC
	<i>Serjania mexicana</i> (L.) Willd. ⁵	VI	
	<i>Serjania palmeri</i> S. Watson ^{2,5}	VI	
	<i>Serjania triquetra</i> Radlk ⁴	VI	
	<i>Thouinidium decandrum</i> (Humb. & Bonpl.) Radlk. ^{2,3,4,5}	TR	LC
Sapotaceae	<i>Urvillea ulmacea</i> Kunth ^{2,5}	VI	
	<i>Sideroxylon occidentale</i> (Hemsl.) T.D.Penn. ⁵	TR	LC
	<i>Sideroxylon palmeri</i> (Rose) T.D.Penn. ^{1,2,4}	TR	LC
	<i>Sideroxylon peninsulare</i> (Brandege) T.D.Penn. ²	TR	EN
	<i>Sideroxylon persimile</i> (Hemsl.) T.D.Penn. ^{2,4}	TR	LC
	<i>Sideroxylon tepicense</i> (Standl.) T.D.Penn. ²	TR	LC
Schoepfiaceae	<i>Schoepfia schreberi</i> J.F. Gmel. ⁵	TR	LC
Scrophulariaceae	<i>Buddleja sessiliflora</i> Kunth ²	SH	LC
	<i>Capraria biflora</i> L. ²	SU	
	<i>Capraria frutescens</i> (Mill.) Britten ⁴	SU	
Solanaceae	<i>Capsicum annuum</i> L. ^{2,4}	SH	LC
	<i>Lycium brevipes</i> Benth. ^{2,4}	SH	
	<i>Lycium andersonii</i> A. Gray ^{3,5}	SH	
	<i>Nicotiana glauca</i> Graham ^{2,4,5}	SH	
	<i>Nicotiana trigonophylla</i> Dunal ²	SU	
	<i>Solanum americanum</i> Mill. ^{2,4,5}	SU	
	<i>Solanum axillifolium</i> K.E. Roe ⁴	SH	EN
	<i>Solanum erianthum</i> D. Don ^{4,5}	SH	
	<i>Solanum hirtum</i> Vahl ²	SH	LC
	<i>Solanum nigrescens</i> M. Martens & Galeotti ⁵	SU	
	<i>Solanum refractum</i> Hook. & Arn. ⁴	VI	
	<i>Solanum torvum</i> Sw ⁴	SH	
Stegnospermataceae	<i>Stegnosperma cubense</i> A. Rich. ⁴	VI	
	<i>Stegnosperma scandens</i> (Lunan) Standl. ^{1,5}	VI	
Talinaceae	<i>Talinum paniculatum</i> (Jacq.) Gaertn. ⁵	SU	
Verbenaceae	<i>Citharexylum affine</i> D. Don ^{2,5}	TR	LC
	<i>Citharexylum berlandieri</i> S. Watson ²	TR	
	<i>Lantana camara</i> L. ^{1,2,4,5}	SH	
	<i>Lippia palmeri</i> S. Watson ²	SH	
	<i>Vitex mollis</i> Kunth ²	TR	
Violaceae	<i>Hybanthus mexicanus</i> Ging. ex DC. ²	SH	
Vitaceae	<i>Cissus tiliacea</i> Kunth ⁴	VI	
	<i>Cissus trifoliata</i> (L.) L. ⁴	VI	
	<i>Cissus verticillata</i> (L.) Nicolson & C.E. Jarvis ^{2,4,5}	VI	
	<i>Parthenocissus quinquefolia</i> (L.) Planch. ²	VI	
Urticaceae	<i>Urera baccifera</i> (L.) Gaudich. ex Wedd. ⁵	SH	LC
Zygophyllaceae	<i>Guaiacum coulteri</i> A. Gray ^{1,2,3,4,5}	TR	A.VU

The sources of information are: 1: Instituto Nacional de Ecología *et al.* (1998); 2: SEMARNAT 2016; 3: Márquez-Salazar *et al.* 2019; 4: van der Heiden *et al.* 2019 and 5: Authors. The growth forms correspond to: Tree (TR), Shrub (SH), Sub-shrub (SU), Vine (VI), Succulent and semi-succulent (SC) and Parasitic (PA). The risk categories of the NOM 059 SEMARNAT are: Sujetas a protección especial (Pr) and Amenazadas (A); from the red list: Least Concern (LC), Near Threatened (NT), Vulnerable (V) y Endangered (EN).

Note: In the present listing *Acanthocereus rosei* (J.G. Ortega) Lode, is considered synonymous of *Peniocereus rosei* J.G Ortega, which appears on the IUCN Red List as Vulnerable (VU).

Table 2. Families with highest richness of genera and species of the Area de Protección de Flora y Fauna Meseta de Cacaxtla, Sinaloa.

Family	Genera		Species	
	Number	Percentage	Number	Percentage
Fabaceae	44	19.73	75	19.28
Malvaceae	19	8.52	31	7.97
Euphorbiaceae	12	5.38	34	8.74
Asteraceae	10	4.48	17	4.37
Cactaceae	9	4.04	21	5.40
Apocynaceae	8	3.59	10	2.57
Acanthaceae	5	2.24	10	2.57
Solanaceae	4	1.79	12	3.08
Convolvulaceae	4	1.79	11	2.83

The nine most diverse families accumulated 15% of the total. They added 115 genera (51.57%) and 221 species (56.81%) (Table 2). When including sub-shrubs in the listing, Malvaceae and Acanthaceae became the family groups with the highest richness of genera and species of the ANP.

It is partially matched with Murphy & Lugo (1986), Narváez-Espinoza *et al.* (2015) and Romero-Duque *et al.* (2019) and totally with Márquez-Salazar *et al.* (2019) and Ferrufino-Acosta *et al.* (2019), due to the reported families with higher records. Fabaceae is the most important family out

of the different registers in dry and semi-humid forests.

The names of 94 taxa were updated, starting from the Instituto Nacional de Ecología *et al.* (1998) source until the authors (2021). The epithet changes were partial and total. The partial modifications included the generic and the specific epithets. The genera alterations were present in 40 species (42.55%) and the specific epithets 39 (41.49%). The complete changes were in 15 taxa. 15.96% of the species were registered with a new name (Table 3).

Table 3. List of updated taxonomic names and synonyms from APFFMC.

Previous name or Synonym	Updated Name
<i>Abutilon dentatum</i> Rose	<i>Abutilon abutiloides</i> (Jacq.) Garcke ex Britton & Wilson
<i>Acacia cochliacantha</i> Willd.	<i>Vachellia campechiana</i> (Mill.) Seigler & Ebinger
<i>Acacia farnesiana</i> (L.) Willd.	<i>Vachellia farnesiana</i> (L.) Wight & Arn.
<i>Acacia macracantha</i> Willd.	<i>Vachellia macracantha</i> (Humb. & Bonpl. ex Willd.) Seigler & Ebinger
<i>Acacia russelliana</i> (Britton & Rose) Lundell	<i>Mariosousa russelliana</i> (Britton & Rose) Seigler & Ebinger
<i>Acaciella crinita</i> (Brandege) Britton & Rose	<i>Acaciella tequilana</i> (S. Watson) Britton & Rose
<i>Acanthocereus occidentalis</i> Britton & Rose	<i>Acanthocereus tetragonus</i> (L.) Hummelinck
<i>Albizia occidentalis</i> Brandege	<i>Hesperalbizia occidentalis</i> (Brandege) Barneby & J.W. Grimes
<i>Baccharis glutinosa</i> Pers.	<i>Baccharis salicina</i> Torr. & A. Gray
<i>Boerhavia scandens</i> L.	<i>Commicarpus scandens</i> (L.) Standl.
<i>Bumelia laetevirens</i> Hemsl.	<i>Sideroxylon palmeri</i> (Rose) T.D. Penn.
<i>Bumelia palmeri</i> Rose	<i>Sideroxylon palmeri</i> (Rose) T.D. Penn.
<i>Bumelia peninsularis</i> Brandege	<i>Sideroxylon peninsulare</i> (Brandege) T.D. Penn.
<i>Bursera odorata</i> Brandege	<i>Bursera fagaroides</i> (Kunth) Engl.
<i>Caesalpinia bonduc</i> (L.) Roxb	<i>Guilandina bonduc</i> Griseb.
<i>Caesalpinia eriostachys</i> Benth.	<i>Cenostigma eriostachys</i> (Benth.) E. Gagnon & G. P. Lewis
<i>Caesalpinia platyloba</i> S. Watson	<i>Coulteria platyloba</i> (S. Watson) N. Zamora
<i>Caesalpinia sclerocarpa</i> Standl.	<i>Libidibia sclerocarpa</i> (Standl.) Britton & Rose
<i>Canavalia maritima</i> Thouars	<i>Canavalia rosea</i> (Sw.) DC.
<i>Capparis flexuosa</i> (L.) L.	<i>Cynophalla flexuosa</i> (L.) J. Presl
<i>Capparis verrucosa</i> Jacq.	<i>Cynophalla verrucosa</i> (Jacq.) J. Presl
<i>Capparis indica</i> (L.) Druce	<i>Quadrella indica</i> (L.) Iltis & Cornejo
<i>Casearia arguta</i> Kunth	<i>Casearia nitida</i> (L.) Jacq.

Previous name or Synonym	Updated Name
<i>Casearia corymbosa</i> Kunth	<i>Casearia nitida</i> (L.) Jacq.
<i>Cassia biflora</i> L.	<i>Senna pallida</i> (Vahl) H.S. Irwin & Barneby
<i>Cedrela occidentalis</i> C.DC. & Rose	<i>Cedrela odorata</i> L.
<i>Ceiba acuminata</i> (S. Watson) Rose	<i>Ceiba aesculifolia</i> (Kunth) Britten & Baker f.
<i>Combretum farinosum</i> Kunth	<i>Combretum fruticosum</i> (Loefl.) Stuntz
<i>Cephalocereus purpusii</i> Britton & Rose	<i>Pilosocereus purpusii</i> (Britton & Rose) Byles & G.D. Rowley
<i>Chlorophora tinctoria</i> (L.) Gaudich.	<i>Maclura tinctoria</i> (L.) D. Don ex Steud.
<i>Colubrina glomerata</i> (Benth.) Hemsl.	<i>Colubrina triflora</i> Brongn. ex Sweet
<i>Commicarpus scandens</i> (L.) Standl.	<i>Boerhavia scandens</i> L.
<i>Cordia brevispicata</i> M. Martens & Galeotti	<i>Varronia curassavica</i> Jacq.
<i>Cordia curassavica</i> (Jacq.) Roem. & Schult.	<i>Varronia curassavica</i> Jacq.
<i>Cordia macrocephala</i> (Desv.) Kunth	<i>Varronia macrocephala</i> Desv
<i>Cordia pringlei</i> B.L. Rob.	<i>Varronia macrocephala</i> Desv
<i>Coutarea latiflora</i> Sessé & Moc. ex DC.	<i>Hintonia latiflora</i> (Sessé & Moc. ex DC.) Bullock
<i>Coutarea pterosperma</i> (S. Watson) Standl.	<i>Hintonia latiflora</i> (Sessé & Moc. ex DC.) Bullock
<i>Croton ciliatoglandulosus</i> Ortega	<i>Croton ciliatoglandulifer</i> Ortega
<i>Diospyros rosei</i> Standl.	<i>Diospyros sphaerantha</i> Standl.
<i>Erioxylum aridum</i> Rose & Standl.	<i>Gossypium aridum</i> (Rose & Standl.) Skovst.
<i>Eupatorium albicaule</i> Sch.Bip. ex Klatt	<i>Koanophyllon albicaulis</i> (Sch.Bip. ex Klatt) R.M. King & H. Rob.
<i>Feuilleea xalapensis</i> (Benth.) Kuntze	<i>Inga vera</i> subsp. <i>spuria</i> (Willd.) J. León
<i>Ficus glaucescens</i> (Liebm.) Miq.	<i>Ficus maxima</i> Mill.
<i>Ficus mexicana</i> (Miq.) Miq.	<i>Ficus maxima</i> Mill.
<i>Ficus padifolia</i> Kunth	<i>Ficus pertusa</i> L.f.
<i>Goldmania foetida</i> (Jacq.) Standl.	<i>Microlobius foetidus</i> (Jacq.) M.Sousa & G. Andrade
<i>Hymenoclea monogyra</i> Torr. & A. Gray	<i>Ambrosia monogyra</i> (Torr. & A. Gray) Strother & B.G. Baldwin
<i>Hyptis albida</i> Kunth	<i>Condea albida</i> (Kunth) Harley & J.F.B. Pastore
<i>Inga eriocarpa</i> Benth	<i>Inga vera</i> subsp. <i>spuria</i> (Willd.) J. León
<i>Jacquinia macrocarpa</i> Cav.	<i>Bonellia macrocarpa</i> (Cav.) B. Ståhl & Källersjö
<i>Jacquinia pungens</i> A. Gray	<i>Bonellia macrocarpa</i> (Cav.) B. Ståhl & Källersjö
<i>Jatropha platyphylla</i> Müll.Arg.	<i>Jatropha peltata</i> Sessé
<i>Karwinskia parvifolia</i> Rose	<i>Karwinskia humboldtiana</i> (Schult.) Zucc.
<i>Lagascea glandulosa</i> Fernald	<i>Lagascea decipiens</i> Hemsl.
<i>Leucaena glauca</i> Benth.	<i>Leucaena leucocephala</i> (Lam.) de Wit
<i>Lysiloma divaricata</i> (Jacq.) J.F. Macbr.	<i>Lysiloma divaricatum</i> (Jacq.) J.F. Macbr.
<i>Lysiloma microphyllum</i> Benth	<i>Lysiloma microphylla</i> Benth
<i>Macfadyena unguis-cati</i> (L.) A.H. Gentry	<i>Dolichandra unguis-cati</i> (L.) L.G. Lohmann
<i>Macroptilium longepedunculatum</i> (Benth.) Urb.	<i>Macroptilium gracile</i> (Benth.) Urb.
<i>Mallotus rhamnifolius</i> (Willd.) Müll.Arg.	<i>Croton rhamnifolius</i> Willd
<i>Nopalea karwinskiana</i> (Salm-Dyck) K. Schum	<i>Opuntia karwinskiana</i> Salm-Dyck
<i>Opuntia puberula</i> Pfeiff.	<i>Opuntia decumbens</i> Salm-Dyck
<i>Opuntia thurberi</i> Engelm.	<i>Cylindropuntia thurberi</i> (Engelm.) F.M. Knuth
<i>Parmentiera edulis</i> DC.	<i>Parmentiera aculeata</i> (Kunth) Seem.
<i>Pedilanthus macrocarpus</i> Benth	<i>Euphorbia lomelii</i> V.W. Steinm.
<i>Peniocereus rosei</i> J. G. Ortega	<i>Acanthocereus rosei</i> (J.G. Ortega) Lodé
<i>Pithecellobium mangense</i> (Jacq.) J.F. Macbr.	<i>Chloroleucon mangense</i> (Jacq.) Britton & Rose
<i>Pithecellobium seleri</i> Harms	<i>Pithecellobium unguis-cati</i> (L.) Benth.
<i>Pithecellobium sonorae</i> S. Watson	<i>Havardia sonorae</i> (S. Watson) Britton & Rose
<i>Plumeria acutifolia</i> Poir.	<i>Plumeria rubra</i> L.
<i>Poincianella eriostachys</i> (Benth.) Britton & Rose	<i>Cenostigma eriostachys</i> (Benth.) E. Gagnon & G. P. Lewis
<i>Polanisia viscosa</i> (L.) DC.	<i>Cleome viscosa</i> L.

Previous name or Synonym	Updated Name
<i>Arivela viscosa</i> (L.) Raf.	<i>Cleome viscosa</i> L.
<i>Randia mitis</i> L.	<i>Randia aculeata</i> L.
<i>Rathbunia alamosensis</i> (J.M. Coult.) Britton & Rose	<i>Stenocereus alamosensis</i> (J.M. Coult.) A.C. Gibson & K.E. Horak
<i>Rhamnus humboldtiana</i> Willd. ex Schult.	<i>Karwinskia humboldtiana</i> (Schult.) Zucc.
<i>Ruellia albicaulis</i> Bertero ex Spreng.	<i>Ruellia inundata</i> Kunth
<i>Ruprechtia occidentalis</i> Standl.	<i>Ruprechtia fusca</i> Fernald
<i>Sarcomphalus amole</i> (Sessé & Moc.) Hauenschild	<i>Ziziphus amole</i> (Sessé & Moc.) M.C. Johnst.
<i>Sesbania exaltata</i> (Raf.) Cory	<i>Sesbania herbacea</i> (Mill.) McVaugh
<i>Solanum nigrum</i> L.	<i>Solanum americanum</i> Mill.
<i>Stegnosperma halimifolium</i> Benth.	<i>Stegnosperma scandens</i> (Lunan) Standl.
<i>Stemmadenia palmeri</i> Rose & Standl.	<i>Tabernaemontana tomentosa</i> (Greenm.) A.O. Simões & M.E. Endress
<i>Stemmadenia tomentosa</i> Greenm.	<i>Tabernaemontana tomentosa</i> (Greenm.) A.O. Simões & M.E. Endress
<i>Suaeda fruticosa</i> Forssk. ex J.F. Gmel.	<i>Suaeda vermiculata</i> Forssk. ex J.F. Gmel.
<i>Tabebuia chrysantha</i> (Jacq.) G. Nicholson	<i>Handroanthus chrysanthus</i> (Jacq.) S.O. Grose
<i>Tabebuia palmeri</i> Rose	<i>Handroanthus impetiginosus</i> (Mart. ex DC.) Mattos
<i>Tabebuia pentaphylla</i> Helmsl.	<i>Handroanthus impetiginosus</i> (Mart. ex DC.) Mattos
<i>Thevetia ovata</i> (Cav.) A.DC.	<i>Cascabela ovata</i> (Cav.) Lippold
<i>Waltheria americana</i> L.	<i>Waltheria indica</i> L.
<i>Willardia mexicana</i> (S. Watson) Rose	<i>Lonchocarpus hermannii</i> M. Sousa
<i>Zanthoxylum monophyllum</i> (Lam.) P. Wilson	<i>Zanthoxylum schreberi</i> (J.F. Gmel.) Reynel ex C. Nelson
<i>Ziziphus sonorensis</i> S. Watson	<i>Ziziphus amole</i> (Sessé & Moc.) M.C. Johnst.

31 taxa switched families. The taxa inclusion of Sterculiaceae to Malvaceae was the most significant change. Renewing taxonomical information is crucial to the proper management and decision taking of ANPs (López-Jiménez *et al.*, 2020). Although in some cases is controversial and disadvantageous due to the disagreement between different fields like the taxonomic and legislative. The updated name of the amapa amarilla is *Handroanthus chrysanthus* (Jacq.) S.O. Grose, but in the Norma Oficial Mexicana NOM-059-SEMARNAT-2010, is shown as *Tabebuia chrysantha* (SEMARNAT, 2019). Having the same species with different names creates a problem of jurisprudence.

The most diverse genera were *Croton* (12 species), *Bursera* (8), *Solanum* (7), *Ficus* and *Randia* (6); *Opuntia*, *Merremia*, *Euphorbia*, *Lonchocarpus*, *Mimosa*, *Senna*, *Jatropha* and *Sideroxylon* (5).

In relation to the taxonomical richness of Sinaloa, Vega (2001), which includes a set of vascular plants of diverse plants communities, estimates 2792 species distributed in 978 genera and 202 families, the APFFMC only from wild woody and semi-woody from dry and semi-humid forest represents 13.93% of the species, 22.80% of the genera and 29.70 % of the families. In the case of

Villaseñor (2016), mentions that 3,736 species, 1,118 genera and 200 families are found in the state. Under this criteria, the ANP would keep 10.41% of the species, 19.95% and 30% of the genera and families estimated for the state. Villaseñor (2016) while including more genera and species and less families, the percentages change, reducing the quantities of genera and species and lightly increasing the families.

Regarding genera with distinct species, those were grouped in classes. The number of genera with a single species were 134, from a total of 223, which concentrated the 60.09%, with two (57/25.56%), with three (14/6.28%) and four (5/2.24%). Adding the first four clusters results in 94.17% of the total. The genera with the highest species richness, which registered five, six, seven, eight, even twelve species, assembled 5.83% (Table 4). The first result is lesser to the one reported by Rodríguez *et al.* (2012), who recorded a high number of genera (77%) represented by a single species. Referring to families with distinct quantities of genera, which were further structured into family classes. Those with just a genus totaled 26 out of 60, with a percentage of 43.33%, with two (11/18.33 %), three (5/8.33 %) and four (6/10 %). The first four classes grouped 80% of the total. The families with highest richness of genera displayed five, six, seven,

Table 4. Number of genera-species and families-genera of woody and semi-woody plants from the Área de Protección de Flora y Fauna Meseta de Cacaxtla, Sinaloa.

Genera classes	Quantity of species	Percentage	Family classes	Quantity of genera	Percentage
1	134	60.09	1	26	43.33
2	57	25.56	2	11	18.33
3	14	6.28	3	5	8.33
4	5	2.24	4	6	10
5	8	3.59	5	3	5
6	2	0.89	6	2	3.33
7	1	0.45	7	1	1.67
8	1	0.45	8	1	1.67
12	1	0.45	9	1	1.67
			10	1	1.67
			12	1	1.67
			19	1	1.67
			44	1	1.67

eight, nine, ten, 12, 19, even 44, which focused the remaining 20% (Table 4).

Of the life-forms, the trees totalled 146 (37.53%), shrubs 114 (29.31%), sub-shrubs 54 (13.88%), vines 51 (13.11%), succulent and semi-succulent 21 (5.40%) and parasitic 3 (0.77%) (Table 5). Coinciding with (Bravo *et al.*, 2016) and Cedeño-Fonseca *et al.* (2020) about the quantity of trees being superior to shrubs and which itself is greater than the vines, similarly with Angel *et al.* (2017), a quantity of sub-shrubs inferior to shrubs and superior to vines was recorded.

Table 5. Richness of growth-forms in the Área de Protección de Flora y Fauna Meseta de Cacaxtla, Sinaloa.

Life-forms	Symbol	Quantity	Percentage
Trees	TR	146	37.53
Shrubs	SH	114	29.31
Sub-shrubs	SU	54	13.88
Vines	VI	51	13.11
Succulent and semi-succulent	SC	21	5.40
Parasitic	PA	3	0.77

The Mexican legislation NOM-059-SEMARNAT-2010 (SEMARNAT, 2019) includes in the Amenazadas (A) category: Botoncillo (*Conocarpus erectus* L.), guayacán (*Guaiacum coulteri* A. Gray), amapa rosa (*Handroanthus impetiginosus* (Mart. ex DC.) Mattos), amapa amarilla (*Handroanthus chrysanthus* (Jacq.) S. O.

Grose), as synonym of *Tabebuia chrysantha* and trucha (*Hesperalbizia occidentalis* (Brandege) Barneby & J.W. Grimes). Sujetas a protección especial (Pr) are listed: Pitaya de Martinez (*Stenocereus martinezii* (J.G. Ortega) Buxb.) and listoncillo (*Gossypium aridum* (Rose & Standl.) Skovst.). By taxonomic group the Bignoniaceae family groups two species of the *Handroanthus* genus. In life-forms six are trees (TR) and one succulent (SC). The red list (IUCN) includes 173 species reported in the ANP. Inside the Least Concern category (LC) fall 155 taxa, Near threatened (NT) four, Vulnerable (V) seven, and Endangered seven. The families which included the total of the species were: Anacardiaceae with 2, Bixaceae (1), Burseraceae (8), Cannabaceae (3), Capparaceae (6), Fouquieriaceae (1), Hernandiaceae (1), Meliaceae (6), Picramniaceae (1), Primulaceae (1), Rubiaceae (8), Rutaceae (6), Sapotaceae (5), Schoepfiaceae (1), Urticaceae (1) and Zygophyllaceae (1). The taxa which registered a partial quantity were: Apocynaceae with 5, Asteraceae (1), Bignoniaceae (5), Boraginaceae (1), Cactaceae (17), Celastraceae (2), Combretaceae (1), Convolvulaceae (1), Erythroxylaceae (1), Euphorbiaceae (14), Fabaceae (38), Lamiaceae (1), Malpighiaceae (2), Malvaceae (7), Moraceae (7), Nyctaginaceae (3), Onagraceae (1) Opiliaceae (1), Polygonaceae (1), Rhamnaceae (6), Salicaceae (1), Sapindaceae (2), Scrophulariaceae (1), Solanaceae (3) and Verbenaceae (1). Species from 41 families were counted (68% of the total) with risk categories. The families with five or more species in the international legislation were: Fabaceae, Cactaceae, Euphorbiaceae, Burseraceae, Rubiaceae, Malvaceae, Moraceae, Capparaceae, Meliaceae, Rutaceae, Rhamnaceae, Bignoniaceae

and Sapotaceae. They added 133 species which compose the 76.88% out of the total 173 included under a risk status. By life-forms 106 taxa of trees were counted, shrubs 43, succulents and semi-succulent 17, sub-shrubs 5 and vines 2. In the red list (IUCN), the representation of the Fabaceae, Malvaceae, Euphorbiaceae and Cactaceae families is noted, which were the ones with the highest taxonomic richness in the APFFMC. Paradoxically the red list shows a wider protection spectrum of species than the NOM 059-SERMARNAT-2010.

CONCLUSIONS

The listing constitutes a compendium which congregates the species richness of woody and semi-woody plants from dry and semi-humid forest from the APFFMC, the product of a compilation of information from various studies published about the ANP throughout different times. Highlighting the wild and native species.

The taxonomical richness ascended to 60 families, 223 genera and 389 species. The ones that contributed the most of families, genera and species to the census were SEMARNAT (2016) (47/165/221), van der Heiden *et al.* (2019) (47/171/245) and authors (2021) (53/175/246) respectively. The total sum surpassed the parts. The results obtained in the review, allow to highlight the relevance of the APFFMC at the conservation of taxa. On a surface inferior to the 1% of the state, between 10.41% & 13.93% of the species, 19.95 & 22.80% of the genera and 29.70 to 30 % of the families are kept under conservation, from only native and wild woody and semi-woody plants from dry and semi-humid forests.

The families with the highest richness of genera and species were: Fabaceae, Malvaceae, Euphorbiaceae, Asteraceae, Cactaceae, Apocynaceae, Acanthaceae, Solanaceae, Convolvulaceae and Boraginaceae. The most diverse genera were: *Croton*, *Bursera*, *Solanum*, *Ficus*, *Randia*, *Jatropha*, *Opuntia*, *Merremia*, *Euphorbia*, *Lonchocarpus*, *Mimosa*, *Senna* and *Sideroxylon*. The taxonomic similarities among tropical dry forest can be partially explained due to the convergence of ecological and historical characteristics. Particularly, geological, geographic, climatic, edaphological and the differences due to the high replacement rates in the latitudinal and altitudinal axes.

One relevant part of the floristic listing was the partial and complete updating of 94 generic and specific epithets, which enclosed 24.26 % of the

total species. The partial modifications were applied to 79 taxa, which added a total of 84.04%.

Among the relations of genus-species and family-genus, inverse relations also exist. The classes with the most taxa were the least numerous. A low quantity of 13 genera and 12 families (out of a total of 223 and 60 respectively) concentrated the highest taxonomical richness, at converging five or more species and genera. On the contrary a high quantity of 210 genera and 48 families presented four or less taxa.

The resulting pattern of the life-forms structure is similar to the dry forests one, where the tree life-form dominates, followed by shrubs, sub-shrubs and vines. The succulents and semi-succulents were superior to the parasitic plants.

The threats to dry and semi-humid forests in the region highlight the importance of their conservation on their natural state. In these scenarios, flora censuses possess relevance to draw comparisons with the exotic, invasive and naturalized plants from the ANP, of anthropogenic origin which arrive accidentally or deliberately.

Seven taxa from the NOM-059-SEMARNAT-2010 were registered. Five inside the Amenazadas category (A) and two Sujetas a protección especial (Pr). Which indicates the lack of proposals to category adjustment and the inclusion of species through studies to evaluate the addition of species with low abundance, with one or few recorded sites of presence or taxa with slow growth rate like Cactaceae and Burseraceae. The introduction of more species to the Mexican legislation from the APFFMC would provide double protection. The Mexican legal response to the biodiversity challenges of woody and semi-woody plants is lax. Contrastingly, the red list (IUCN) has listed 173 species in four different risk status.

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