

## Plants used as medicinal in Güémez, Tamaulipas, north-eastern Mexico

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### Abstract

The use of medicinal plants in Mexico has a diverse and deeply-rooted tradition concerning. Plants play an important role in traditional medicine among the inhabitants of Güémez, Tamaulipas in northeastern Mexico. With the aim of obtaining quantitative information on the plants and their uses as medicinal sources, semi-structured interviews with 113 local residents were taken. In addition, Informant Consensus Factor (ICF) and Use Value (UV) were calculated. A total of 85 species of medicinal plants belonging to 44 families were identified. The most common families were Asteraceae, Lamiaceae and Euphorbiaceae. The most used part of the plant was the leaf and the most frequent preparation method was boiling, preparing as an infusion. A total of 50 medicinal uses were registered. Fever had highest ICF (0.93), whereas, according to UV, the most important plants were *Artemisia ludoviciana* Nutt., *Mentha spicata* L., *Matricaria recutita* L. and *Achillea millefolium* L. The information generated strengthens traditional knowledge, bringing new species and uses to the country's records for future phytochemical studies that could lead to new medicines.

**Keywords:** ethnobotany, medicinal plants; quantitative analysis; traditional medicine; use value

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### Introduction

About 80% of the world's population relies on traditional medicine to satisfy primary health care needs (Bermúdez *et al.*, 2005; Ayyanar and Ignacimuthu, 2011; Panyaphu *et al.*, 2011). The World Health Organization has registered approximately 21,000 plant species for medicinal uses around the world (Malla *et al.*, 2015). Medicinal plants are an important source of current drugs. About 25% of the world's prescription drugs come from plants (Bulut and Tuzlaci, 2013).

Mexico has a diverse and deeply-rooted tradition concerning the use of medicinal plants (Estrada-Castillón *et al.*, 2018). In Mexico, there are more than 23,400 vascular plants and 5,000 species are used for medicinal purposes and the most important families are Asteraceae, Lamiaceae, Fabaceae, and Euphorbiaceae (Casas *et al.*, 2001; Camou-Guerrero *et al.*, 2008; Alonso-Castro *et al.*, 2012). Also is ranked sixth in the world regarding greatest cultural diversity (Mercado, 2013), as it has 62 ethnic groups (Juárez-Rosete *et al.*, 2013). Most ethnic groups use medicinal plants because of their efficiency, tradition and low costs (Kayani *et al.*, 2015; Tribess *et al.*, 2015). In particular, rural areas contribute with most knowledge about medicinal plants (Kayani *et al.*, 2015). These plants help communities to survive in remote areas (Gómez, 2012).

Nowadays, it's recognized that in Mexico and many countries around the world the transmission of knowledge regarding the use of medicinal plants from old to new generations is declining and are experiencing loss of useful plants due (Quesada, 2008; Calvo *et al.*, 2011; Hassan-Abdallah *et al.*, 2013) as well as losing entire villages and local populations due to lack of work, education and medical care (Panyaphu *et al.*, 2011). This fact is also a reality in rural communities because of globalization and the use of allopathic medicine (Esquivel-García *et al.*, 2018). Therefore, it is important to rescue this knowledge to prevent the loss of ethnomedical traditions, which is a scientific and cultural heritage important for future generations.

The municipality of Güémez, located in the northeast of Mexico, covers 1.5% of the Tamaulipas state. Its economy is based on agriculture (citrus, safflower, bean, maize, henequen and sorghum), cattle raising and forestry production also take place on smaller scale. However, there are no local inhabitants selling medicinal plants. The local people live in houses of 'adobe' (building material made from soil and often organic material), wood and concrete. Health services are scarce with little medicine and few doctors. Some villages do not have drainage, clean water, electricity, so migration is commonplace due to lack of security, education and employment.

The objective of this study is to know the most commonly used medicinal plants and their uses by the inhabitants of the municipality of Güémez with the purpose to revaluing and saving this traditional knowledge in this region of Mexico.

## Materials and Methods

### *Study area*

The municipality of Güémez is located within the *Sierra Madre Oriental* and is part of the central-western region of State of Tamaulipas (Figure 1) (24°06' - 23°41'N and 99°30' - 98°45'W), its altitude is from 200 to 2,800 m. It covers 1,204.55 km<sup>2</sup>, has 43 localities with a population of 15,659 inhabitants, of which 80% live in urban areas and 20% in small villages called '*ejidos*'. The climate of the region is temperate to sub-humid, in mountainous areas and semi-dry to very warm in the lowlands. The mean annual temperature ranges from 12 to 26 °C and the annual rainfall is 600 to 1,100 mm (INEGI, 2009).

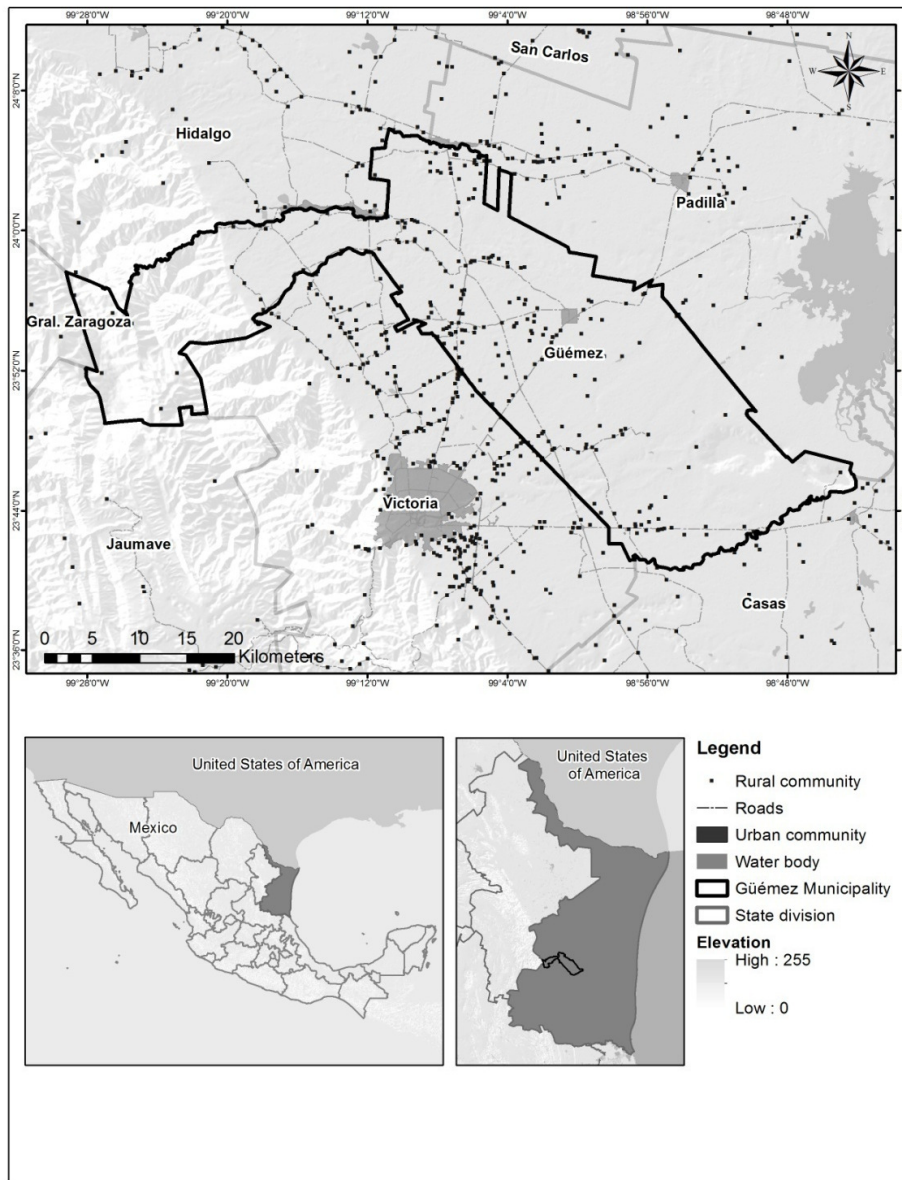
### *Fieldwork*

Wild and cultivated medicinal species in the study area were collected. Plant samples obtained were pressed and dried according to the method described by Sánchez-González and González (2007). Specimens were identified by the authors through the Manual of the Vascular Plants of Texas (Correll and Johnston, 1970), scientific names were consulted in The Plant List (<http://www.theplantlist.org/>). The complete collection of specimens was included in the CFNL herbarium (acronym according to Thiers, 2011). We include the common name in Spanish for all plants species registered during interviews.

### *Data collection*

Direct interviews were conducted with the villajes called "*ejidos*" *Los San Pedros, La Esperanza, San Cayetano, Graciano Sánchez, La Yerbabuena, Constitución del 17, Servando Canales, San José de Las Flores*

and *Viento Libre*. A total of 113 inhabitants, 32 men and 81 women with ages ranging between 30 and 90 years old, were interviewed individually. The interviewees were housewives, cattle ranchers, loggers, farmers and healers. All the interviews were carried out through visits to homes and in the field. The information for the ethnomedicinal species was recorded in Spanish, as it is the only language spoken in the region, through semi-structured interviews. The questions were about common plant names, medicinal use, part of plant used, methods of preparation and route of administration.



**Figure 1.** Location of the municipality of Güémez, Tamaulipas, Mexico

*Data analysis*

The diseases treated with medicinal plants were classified into 13 categories: (1) gastrointestinal system (gastritis, poor digestion, constipation, intestinal ulcer, diarrhea, vomiting, stomach inflammation, flatulence, nausea, stomach pain, lack of appetite, toothache, mouth infection, bad breath), (2) respiratory system (bronchitis, asthma, cough), (3) blows and wounds (external blows, wounds, internal blows, sunken

fontanelles, extraction of thorns), (4) dermatological (rashes, ringworm, herpes virus, baldness, fungus feet), (5) endocrine system (diabetes, cancer), (6) nervous system (insomnia, headaches, nerves, stress, dizziness), (7) muscular skeletal system (rheumatism, osteoporosis), (8) circulatory system (hemorrhoids, varicose veins, anemia, impaired immune system), (9) fever (high temperature, typhoid), (10) intestinal parasites (worms), (11) ophthalmologic (eye infections), (12) urinary system (Kidney, urinary infections), (13) female reproductive system (Menstrual cramps, infertility, abortion).

The ICF adapted by Heinrich *et al.* (1998), is calculated according to following formula:  $ICF = (Nur - Nt) / (Nur - 1)$  where Nur refers to number of citations of uses given in each category and Nt to number of species used. This method is used to test the homogeneity of information. The ICF offers a range of 0-1, where high values (about 1) are obtained, when there is a well-defined selection criterion in the community and/or if information is exchanged between informants, and the values are low (near zero) if plants are chosen at random or if there is no exchange of information about their use among informants.

The use value (Trotter and Logan, 1986), demonstrates the relative importance of locally known species and is calculated according to the following formula:  $UV = U / N$ , where U refers to number of citations per species and N to number of informants.

## Results

### *Richness of medicinal plants*

According to the results of specimen identification, 85 species with medicinal uses, belonging to 41 families were reported by interviewees. Among them, 45 species are cultivated and 40 species are wild. The most common families of medicinal plants are Asteraceae (17.64%), Lamiaceae (11.76%), Euphorbiaceae (7.05%) and Rutaceae (4.70%). During the study, 126 samples were collected in the study area. Plants used for medicinal purposes in Güémez are presented in Appendix 1 in alphabetical order according to family and scientific name.

The most commonly mentioned species were *Artemisia ludoviciana* (n = 51), *Mentha spicata* (n = 44), *Matricaria recutita* (n = 37), *Achillea millefolium* L. (n = 30) and *Ruta graveolens* L. (n = 28). Herein, we report eight native species of Mexico considered as new records of traditional medicinal plants in this country, which are: *Boerhavia spicata* Choisy, *Cirsium texanum* Buckley, *Cynanchum barbigerum* (Scheele) Shinnery, *Dalea scandens*, *Oenothera brachycarpa* A. Gray, *Smallanthus maculatus* (Cav.) H. Rob., *Stevia origanoides* Kunth and *Tauschia madreensis* J.M. Coult. & Rose (Appendix 1).

The biological forms of the medicinal species mentioned by the interviewees were herbaceous (47 species), shrubs (21 species) and trees (17 species).

The most frequently used plant parts for the preparation of medicines were leaves (42 plants), branches (leaf and stem) (21 plants), roots (8 plants), whole plants (6 plants), flowers (6 plants), fruits (5 plants), tree bark (4 plants) (Appendix 1).

### *Disease categories*

In the region, a total of 50 illnesses or diseases are treated with medicinal plants. Local people choose to use plants, mainly for stomachaches (22 plants), kidney diseases (13 plants), diarrhea (12 plants), coughs (11 plants), spots on skin (9 plants) and others (Appendix 1).

Other medicinal plants in Güémez such as *Glandularia bipinnatifida* (Schauer) Nutt., *Smilax bona-nox* L., *Cestrum tomentosum* L.f., *Ruta graveolens*, *Rosmarinus officinalis* L. and *Ocimum basilicum* L. are used for magical purposes, mainly to remove bad luck and cleanse the soul.

*Use value (UV)*

Use values range from 0.008 to 0.44. The highest values were reported for *Artemisa ludoviciana* (UV = 0.44), *Mentha spicata* (UV = 0.38), *Matricaria recutita* (UV = 0.32), *Achillea millefolium* = 0.26), *Marrubium vulgare* L. (UV = 0.22), *Azadirachta indica* A. Juss. (UV = 0.22), *Psidium guajava* L. (UV = 0.21), *Ruta graveolens* (UV = 0.20) (Appendix 1).

*Informant consensus factor (ICF)*

There were 13 main categories of ailments based on ICF data. The ICF interval was 0.1 to 0.93. The results showed that the highest ICF was reported for the fever category with a value of 0.93, followed by ophthalmological problems (mainly eye infections) (0.75), intestinal parasites (mainly worms) (0.75), respiratory ailments (mainly colds) (0.72) and endocrine system (mainly diabetes) (0.66), gastrointestinal system (0.59) and bumps and wounds (0.59) (Table 1).

**Table 1.** Informant consensus factor (ICF)

N°	Category	Ailments and diseases	Number of citations	Number of species	ICF
1	Gastrointestinal system	Gastritis, bad digestion, constipation, intestinal ulcers, diarrhea, vomiting, stomach inflammation, flatulence, nausea, stomach pain, lack of appetite, toothache, mouth infection, bad breath	95	39	0.59
2	Respiratory system	Bronchi, asthma, cough	45	13	0.72
3	Blows and wounds	External blows, wounds, internal blows, sunken fontanelle, extraction of thorns	28	12	0.59
4	Dermatological	Rash, ringworm, herpes virus, baldness, foot fungus	14	16	0.15
5	Endocrine system	Diabetes, cancer	25	9	0.66
6	Nervous system	Insomnia, headache, nervousness, stress, dizziness	15	10	0.32
7	Muscular skeletal system	Rheumatism, osteoporosis	6	3	0.6
8	Circulatory system	Hemorrhoids, varicose veins, anaemia, impaired immune system	14	7	0.53
9	Fever	High temperature, typhoid	16	2	0.93
10	Intestinal parasites	Worms	9	3	0.75
11	Ophthalmologic	Eye infection	5	2	0.75
12	Urinary system	Kidney, urinary tract infections	24	13	0.47
13	Female reproductive system	Menstrual cramps, infertility, abortion	10	10	0.1

*Method of preparation of the traditional medicines*

The medicinal plants used by the local inhabitants are prepared and administered in different ways. Various methods of preparation and application are presented. According to ailment, preparation differs such as being boiled (62 plants), taken raw (17 plants), fermented in water (6 plants), cooked (3 plants), fermented in alcohol (2 plants), and fried (1 plant) (Appendix 1). Boiled and crude are the most commonly used methods for preparation of remedies. As a result of the records of the interviews, 50 species of plants are prepared for consumption, 15 plants are prepared for external use, while 20 species are used to alleviate both internal and external ailments.

The main routes of administration of the plants are oral (76%), followed by intestinal washes (24%) and poultices (4%). We do not include the exact proportions used for each medicinal plant, because there is a contradiction with respect to the exact dosage. The dose is usually measured by cups of infusion.

Most remedies are based on the use of a plant. However, Table 2 shows eleven combinations of medicinal plants reported by informants. Most are composed of six species, of which *Mentha spicata* is the plant most used in several combinations, followed by *Psidium guajava*, *Ocimum basilicum*, *Ruta graveolens*, *Matricaria recutita* and *Poliomintha longiflora*. The combination of the species *Crataegus tracyi* and *Arctostaphylos pungens* is the most recorded one found during the interviews. The main ailments treated with these mixtures are gastrointestinal diseases.

**Table 2.** Combinations of plant species used for medicinal purposes in Güémez, Tamaulipas, Mexico

Recipe	Plants and used part	Ailment/ Symptoms	Preparation	Number of mentions
1	<i>Mentha spicata</i> (leaves), <i>Quercus polymorpha</i> (treebark), <i>Rosa gallica</i> (flower)	Stomach pain	Boiled, drink solution	1
2	<i>Psidium guajava</i> (leaves), <i>Cinnamomum</i> sp. (tree bark), <i>Majorana hortensis</i> (branch), <i>Achillea millefolium</i> (leaves)	Diarrhea	Boiled, drink solution	1
3	<i>Crataegus tracyi</i> (root), <i>Arctostaphylos pungens</i> (root)	Kidney	Boiled, drink solution	6
4	<i>Ocimum basilicum</i> (leaves), <i>Mentha spicata</i> (leaves)	Cough	Boiled, drink solution	1
5	<i>Agave celsii</i> (leaves), <i>Citrus limon</i> (fruits)	Fever		3
6	<i>Mentha spicata</i> (Leaves), <i>Matricaria recutita</i> (branch), <i>Ruta graveolens</i> (branch)	Stomach pain	Boiled, drink solution	1
7	<i>Prosopis glandulosa</i> (tree bark), <i>Ebenopsis ebano</i> (tree bark), <i>Opuntia</i> spp. (cactus leaves)	Diarrhea	Boiled, drink solution	1
8	<i>Eucalyptus globulus</i> (leaves), <i>Poliomintha longiflora</i> (leaves)	Cough	Boiled, drink solution	1
9	<i>Ocimum basilicum</i> (leaves), <i>Poliomintha longiflora</i> (branch)	Stomach pain	Boiled, drink solution	1
10	<i>Psidium guajava</i> (leaves), <i>Prunus persica</i> (leaves)	Stomach pain	Boiled, drink solution	1
11	<i>Cynodon dactylon</i> (whole plant), <i>Matricaria recutita</i> (branch), <i>Ruta graveolens</i> (branch)	Digestion	Mix these plants, apply some heat, place on a flannel with ashes and pieces of brick, put over the stomach	1

## Discussion

The Asteraceae family has been reported as the most used in several regions of Mexico (Cervantes and Valdés, 1990; Camou-Guerrero *et al.*, 2008; Alonso-Castro *et al.*, 2012; Estrada-Castillón *et al.*, 2014, 2018; García-Hernández *et al.*, 2015; Pérez-Nicolás *et al.*, 2017; Esquivel-García *et al.*, 2018), as well as worldwide (Ghorbani *et al.*, 2011; Bulut and Tuzlaci, 2013; Leto *et al.*, 2013; Nawash *et al.*, 2013; Bolson *et al.*, 2015), probably due to the high diversity of its phytochemical constituents. Some studies have reported that this family

has a wide range of biologically active compounds and has high species richness worldwide (Heinrich *et al.*, 1998; Thomas *et al.*, 2009).

Following the IUCN Red List of Threatened Species, the only species under protection status is *Dalea scandens* (Mill.) R.T. Clausen assessed as being of Least Concern (Groom, 2012).

The possible reasons that herbaceous plants have the highest frequency of use is because bioactive compounds can be easily extracted (Lulekal *et al.*, 2013; Kayani *et al.*, 2015) and their high availability (planted in gardens, wild habitat and roadsides) (Tsobou *et al.*, 2013). Similar conclusions are drawn from other studies in other parts of the world (Ghorbani *et al.*, 2011; Sivasankari *et al.*, 2014; Yaseen *et al.*, 2015).

The medicinal species best known by the population in the study area were those that were used for uncomplicated ailments, similar findings are reported by Pérez-Nicolás *et al.* (2017) for the state of Oaxaca in southeaster Mexico.

The most frequently used plant parts for the preparation of medicines were leaves. Several ethnomedicinal studies in Mexico, Bangladesh, China, Colombia and India have reported that leaves are the most used parts of plants (Singh and Singh, 2009; Teklehaymanot, 2009; Packer *et al.*, 2012; Sivasankari *et al.*, 2014; Pérez-Nicolás *et al.*, 2017; Estrada-Castillón *et al.*, 2018). This is because they are the most abundant part of a plant and they are easier to collect (Giday *et al.*, 2003). It may also be due to their greater effectiveness, since leaves have increased amounts of secondary metabolites like alkaloids, tannins and inulins, which are active components of many medicines (Yemele *et al.*, 2015). In addition, the use of leaves favors the conservation of plants, since the collection of roots can kill the plant and endanger the species (Telefo *et al.*, 2012; Kadir *et al.*, 2013).

In the study area the most frequently used medicinal species are *Artemisia ludoviciana*, *Mentha spicata*, *Matricaria recutita* and *Ruta graveolens*, in the same way such plants are used by the inhabitants of Santiago Camotlán, Oaxaca (Pérez-Nicolás *et al.*, 2017).

#### *Disease categories*

Ethnobotanical studies reveal that stomach pain is the most frequent ailment treated by medicinal plants (Polat and Satil, 2012; Kayani *et al.*, 2015; Tribess *et al.*, 2015; Estrada-Castillón *et al.*, 2018). Globally, gastrointestinal diseases account for 2.2 million deaths each year and are caused by viruses, bacteria or parasites (Monigatti *et al.*, 2013). The second most notable illness was related to the kidneys, which may be due to low intake of water during the cold season and the hard-agricultural work (Kayani *et al.*, 2015).

In the study area medicinal plants are also used for magical purposes, like to remove bad luck. This is a common practice in the Mexican tradition (Frei *et al.*, 1998; Andrade-Cetto, 2009). Since ancient times in Mexico, people have believed that diseases were caused by evil spirits, witchcraft and magic (Gallardo-Arias, 2004). Local healers prescribe medicinal plants, through a ritual of prayers while rubbing medicinal plants on the body of sick person. Most informants mentioned that such traditional knowledge was transmitted by their parents and grandparents over the years.

#### *Use Value (UV) and Informant Consensus Factor (ICF)*

Most of the plant's species registered in this study are native to Europe and Asia and their use may have been popularized in Mexico because of their efficiency, adaptation and fast growth (Juárez-Rosete *et al.*, 2013).

The high values of ICF could indicate that these diseases are common in the studied population, where there is a need to cure these diseases, and, thus, there is knowledge among the local population about the uses of medicinal plants (Nawash *et al.*, 2013).

#### *Method of preparation of the traditional medicines*

Oral is the most routes of administration of plants used by the inhabitants of this study area because of their ease, similar findings have been reported in countries such as Pakistan (Kadir *et al.*, 2012, 2013) and India (Ayyanar and Ignacimuthu, 2011).

Most remedies are based on the use of a plant and other is combinations of medicinal plants reported by informants. This can be attributed to the fact that any one plant can contain several compounds that perform different functions in the body (Focho *et al.*, 2009). The plants are combined because people believe that the blend could improve the synergistic effect of the pharmacological effects of plants (Igoli *et al.*, 2005; Giday *et al.*, 2010).

### Conclusions

This study reveals that for the inhabitants of the municipality of Güémez, the use of traditional medicine is frequent, and most local people still rely on plant-based remedies for common health problems. Thus, we emphasize the need to develop actions to avoid the loss of traditional knowledge of medicinal plants, not only to preserve this cultural heritage but also to record information on useful species that could be used to develop new medicines and provide other benefits, while contributing to protecting local biodiversity.

### Authors' Contributions

Conceptualization: EEC and SNJG; Data curation: SNJG and JRAS; Funding acquisition: EEC, Investigation: SNJG and JAED; Methodology: EEC, SNJG and JAVQ; Project administration: JRAS and EEC; Supervision: JAVQ and JAED; Writing - original draft: SNJG; Writing - review and editing: JAED. All authors read and approved the final manuscript. All authors read and approved the final manuscript.

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### Conflict of Interests

The authors declare that there are no conflicts of interest related to this article.

### References

- Alonso-Castro A, Maldonado-Miranda J, Zarate-Martínez A, Jacobo-Salcedo M, Fernández-Galicia C, Figueroa-Zúñiga L, ... Carranza-Álvarez C (2012). Medicinal plants used in the Huasteca Potosina, México. *Journal of Ethnopharmacology* 143:292-298. <https://doi.org/10.1016/j.jep.2012.06.035>
- Andrade-Cetto A (2009). Ethnobotanical study of the medicinal plants from Tlanchinol, Hidalgo, México. *Journal of Ethnopharmacology* 122:163-171. <https://doi.org/10.1016/j.jep.2008.12.008>
- Ayyanar M, Ignacimuthu S (2011). Ethnobotanical survey of medicinal plants commonly used by Kanitribals in Tirunelveli hills of western Ghats, India. *Journal of Ethnopharmacology* 134:851-864. <https://doi.org/10.1016/j.jep.2011.01.029>



- Bermúdez A, Oliveira-Miranda MA, Velázquez D (2005). La investigación etnobotánica sobre plantas medicinales: una revisión de sus objetivos y enfoques actuales [Ethnobotanical research on medicinal plants: a review of their current objectives and approaches]. *Interciencia* 30:453-459. <http://www.saber.ula.ve/handle/123456789/16618>
- Bolson M, Hefler S, Dall'Oglio E, Gasparotto A, Cardozo E (2015). Ethno-medicinal study of plants used for treatment of human ailments, with residents of the surrounding region of forest fragments of Paraná, Brazil. *Journal of Ethnopharmacology* 161:1-10. <https://doi.org/10.1016/j.jep.2014.11.045>
- Bulut G, Tuzlaci E (2013). Ethnobotanical study of medicinal plants in Turgutlu (Manisa-Turkey). *Journal of Ethnopharmacology* 149:633-647. <https://doi.org/10.1016/j.jep.2013.07.016>
- Calvo MI, Akerreta S, Cavero RY (2011). Pharmaceutical ethnobotany in the Riverside of Navarra (Iberian Peninsula). *Journal of Ethnopharmacology* 135(1):22-33. <https://doi.org/10.1016/j.jep.2011.02.016>
- Camou-Guerrero A, Reyes-García V, Martínez-Ramos M, Casas A (2008). Knowledge and use value of plant species in a rarámuri community: A gender perspective for conservation. *Human Ecology* 36:259-272. <https://doi.org/10.1007/s10745-007-9152-3>
- Cano JH, Volpato G (2004). Herbal mixtures in the traditional medicine of eastern Cuba. *Journal of Ethnopharmacology* 90:293-316. <https://doi.org/10.1016/j.jep.2003.10.012>
- Casas A, Valiente-Banuet A, Viveros J, Caballero J, Cortés L, Dávila P, Lira R, Rodríguez I (2001). Plant resources of the Tehuacan-Cuicatlan Valley, Mexico. *Economic Botany* 55:129-166. <https://doi.org/10.1007/BF02864551>
- Cervantes L, Valdés J (1990). Plantas medicinales del Distrito de Ocotlán Oaxaca [Medicinal plants of the District of Ocotlán Oaxaca]. *Anales Instituto de Biología Universidad Nacional Autónoma de México. Serie Botánica* 60:85-103.
- Correll DS, Johnston MC (1970). *Manual of the vascular plants of Texas*. University of Texas, Dallas, TX.
- Esquivel-García R, Pérez-Calix E, Ochoa-Zarzosa A, García-Pérez ME (2018). Ethnomedicinal plants used for the treatment of dermatological affections on the Purépecha Plateau, Michoacán, Mexico. *Acta Botanica Mexicana* 125:95-132. <http://dx.doi.org/10.21829/abm125.2018.1339>
- Estrada-Castillón E, Garza-López M, Villarreal-Quintanilla JA, Salinas-Rodríguez M, Soto-Mata B, González-Rodríguez H, ... Cantú-Ayala C (2014). Ethnobotany in Rayones, Nuevo León, México. *Journal of Ethnobiology and Ethnomedicine* 10:1-13. <https://doi.org/10.1186/1746-4269-10-62>
- Estrada-Castillón E, Villarreal-Quintanilla JA, Salinas-Rodríguez M, Encina-Domínguez JA, González-Rodríguez H, Romero Figueroa G, Arévalo JR (2018). Ethnobotanical survey of useful species in Bustamante, Nuevo León, Mexico. *Human Ecology* 46:117-132. <https://doi.org/10.1007/s10745-017-9962-x>
- Focho DA, Nkeng EAP, Lucha CF, Ndam WT, Afegenu IA (2009). Ethnobotanical survey of plants used to treat diseases of the reproductive system and preliminary phytochemical screening of some species of Malvaceae in Ndop central sub-division, Cameroon. *Journal of Medicinal Plants Research* 3:301-314.
- Frei B, Baltisberger M, Sticher O, Heinrich M (1998). Medical ethnobotany of the Zapotecs of the Isthmus-Sierra (Oaxaca, Mexico): documentation and assessment of indigenous uses. *Journal of Ethnopharmacology* 62:149-165. [https://doi.org/10.1016/S0378-8741\(98\)00051-8](https://doi.org/10.1016/S0378-8741(98)00051-8)
- Gallardo-Arias P (2004). Los especialistas de la curación. Curanderos teenek y nahuas de Aquismón [The healing specialists. Teenek and Nahuas healers of Aquismón]. *Anales de Antropología* 38:179-200. <http://dx.doi.org/10.22201/iaa.24486221e.2004.1.16589>
- García-Hernández K, Vibrans H, Rivas-Guevara M, Aguilar-Contreras A (2015). This plant treats that illness? The hot-cold system and therapeutic procedures mediate medicinal plant use in San Miguel Tulancingo, Oaxaca, Mexico. *Journal of Ethnopharmacology* 163:12-30. <https://doi.org/10.1016/j.jep.2015.01.001>
- Ghorbani A, Langenberger G, Feng L, Sauerborn J (2011). Ethnobotanical study of medicinal plants utilized by Hani ethnicity in Naban river watershed national nature reserve, Yunnan, China. *Journal of Ethnopharmacology* 134:651-667. <https://doi.org/10.1016/j.jep.2011.01.011>
- Giday M, Asfaw Z, Elmqvist T, Woldu Z (2003). An ethnobotanical study of medicinal plants used by the Zay people in Ethiopia. *Journal of Ethnopharmacology* 85:43-52. [https://doi.org/10.1016/S0378-8741\(02\)00359-8](https://doi.org/10.1016/S0378-8741(02)00359-8)
- Giday M, Asfaw Z, Woldu Z (2010). Ethnomedicinal study of plants used by Sheko ethnic group of Ethiopia. *Journal of Ethnopharmacology* 132:75-85. <https://doi.org/10.1016/j.jep.2010.07.046>
- Gómez AR (2012). Plantas medicinales en una aldea del Estado de Tabasco, México [Medicinal plants in a village in the State of Tabasco, Mexico]. *Revista Fitotecnia Mexicana* 35:43-49.
- Groom A (2012). *Dalea scandens*. The IUCN Red List of Threatened Species 2012. <https://doi.org/10.2305/IUCN.UK.2012>

- Hassan-Abdallah A, Merito A, Hassan S, Aboubaker D, Djamab M, Asfaw Z, Kelbessa E (2013). Medicinal plants and their uses by the people in the region of Randa, Djibouti. *Journal of Ethnopharmacology* 148:701-713. <https://doi.org/10.1016/j.jep.2013.05.033>
- Heinrich M, Robles M, West JE, Ortiz de Montellano BR, Rodríguez E (1998). Ethnopharmacology of mexican Asteraceae (Compositae). *Annual Review of Pharmacology and Toxicology* 38:539-565. <https://doi.org/10.1146/annurev.pharmtox.38.1.539>
- Igoli JO, Ogali OJ, Tor-Anyiin TA, Igoli NP (2005). Traditional medicine practice amongst the Igede people of Nigeria. Part II. *African Journal of Traditional Complementary and Alternative Medicines* 2:134-152.
- INEGI (Instituto Nacional de Estadística y Geografía). (2009). Prontuario de información geográfica municipal de los Estados Unidos Mexicanos, México [Municipal geographic information record of the United Mexican States, Mexico].
- Juárez-Rosete CR, Aguilar-Castillo JA, Juárez-Rosete ME, Bugarín-Montoya R, Juárez-López P (2013). Hierbas aromáticas y medicinales en México: tradición e innovación [Aromatic and medicinal herbs in Mexico: tradition and innovation]. *Revista Biociencias* 2:119-129. <https://doi.org/10.15741/revbio.02.03.06>
- Kadir M, Bin M, Shams T, Mia MMK (2012). Ethnobotanical survey of medicinal plants used by Bangladeshi traditional health practitioners in the management of diabetes mellitus. *Journal of Ethnopharmacology* 144:605-611. <https://doi.org/10.1016/j.jep.2012.09.050>
- Kadir M, Bin M, Shams T, Mia MMK (2013). Ethnopharmacological survey of medicinal plants used by traditional healers in Bangladesh for gastrointestinal disorders. *Journal of Ethnopharmacology* 147:148-156. <https://doi.org/10.1016/j.jep.2013.02.023>
- Kayani S, Ahmad M, Sultana S, Shinwari Z, Zafar M, Yaseen G, ... Bibi T (2015). Ethnobotany of medicinal plants among the communities of Alpine and Sub-alpine regions of Pakistan. *Journal of Ethnopharmacology* 164:186-202. <https://doi.org/10.1016/j.jep.2015.02.004>
- Leto C, Tuttolomondo T, La Bella S, Licata M (2013). Ethnobotanical study in the Madonie Regional Park (Central Sicily, Italy)-Medicinal use of wild shrub and herbaceous plant species. *Journal of Ethnopharmacology* 146:90-112. <https://doi.org/10.1016/j.jep.2012.11.042>
- Lulekal E, Asfaw Z, Kelbessa E, Van Damme P (2013). Ethnomedicinal study of plants used for human ailments in Ankober District, North Shewa Zone, Amhara region, Ethiopia. *Journal of Ethnobiology and Ethnomedicine* 9:1-13. <https://doi.org/10.1186/1746-4269-9-63>
- Malla B, Gauchan D, Chhetri R (2015). An ethnobotanical study of medicinal plants used by ethnic people in Parbat district of western Nepal. *Journal of Ethnopharmacology* 165:103-117. <https://doi.org/10.1016/j.jep.2014.12.057>
- Mercado A (2013). Estudio de plantas medicinales usadas por cuicatecos en la localidad de Santos Reyes Pápalo, Cuicatlán, Oaxaca. [Study of medicinal plants used by cuicatecos in Santos Reyes Pápalo, Cuicatlán, Oaxaca.] Unpublished Bachelor's Thesis. Universidad Nacional Autónoma de México. México, D.F.
- Monigatti M, Bussmann R, Weckerle C (2013). Medicinal plant use in two Andean communities located at different altitudes in the Bolívar Province, Peru. *Journal of Ethnopharmacology* 145:450-464. <https://doi.org/10.1016/j.jep.2012.10.066>
- Nawash O, Shudiefat M, Al-Tabini R, Al-Khalidi K (2013). Ethnobotanical study of medicinal plants commonly used by local bedouins in the Badia region of Jordan. *Journal of Ethnopharmacology* 148:921-925. <https://doi.org/10.1016/j.jep.2013.05.044>
- Packer J, Brouwer N, Harrington D, Gaikwad J, Heron R, Elders Y, ... Jamie J (2012). An ethnobotanical study of medicinal plants used by the Yaegl Aboriginal community in northern New South Wales, Australia. *Journal of Ethnopharmacology* 139:244-255. <https://doi.org/10.1016/j.jep.2011.11.008>
- Panyaphu K, Van-On T, Sirisa-ard P, Srisanga P, Chansakaow S, Nathakarnkitkul S (2011). Medicinal plants of the Mien (Yao) in northern Thailand and their potential value in the primary healthcare of postpartum women. *Journal of Ethnopharmacology* 135:226-237. <https://doi.org/10.1016/j.jep.2011.03.050>
- Pérez-Nicolás M, Vibrans H, Romero-Manzanares A, Saynes-Vásquez A, Luna-Cavazos M, Flores-Cruz M, Lira-Saade R (2017). Patterns of Knowledge and Use of Medicinal Plants in Santiago Camotlán, Oaxaca, Mexico. *Economic Botany* 71(3):209-223. <https://doi.org/10.1007/s12231-017-9384-0>
- Polat R, Satil F (2012). An ethnobotanical survey of medicinal plants in Edremit gulf (Balıkesir-Turkey). *Journal of Ethnopharmacology* 139:626-641. <https://doi.org/10.1016/j.jep.2011.12.004>
- Quesada HA (2008). Las plantas medicinales [Medicinal plants]. *Revista Biocenosis* 21:20-24.

- Sánchez-González A, González LM (2007). Técnicas de recolección de plantas y herborización. In: Contreras-Ramos A, Cuevas-Cardona C, Goyenechea I, Iturbide U. La sistemática, base del conocimiento de la biodiversidad [Plant collection techniques and herbization] pp 123-133. Universidad Autónoma del Estado de Hidalgo, Hidalgo, México.
- Singh A, Singh PK (2009). An ethnobotanical study of medicinal plants in Chandauli District of Uttar Pradesh, India. *Journal of Ethnopharmacology* 121:324-329. <https://doi.org/10.1016/j.jep.2008.10.018>
- Sivasankari B, Amamdhara M, Gunasekaran P (2014). An ethnobotanical study of indigenous knowledge on medicinal plants used by the village peoples of Thoppampatti, Dindigul district, Tamilnadu, India. *Journal of Ethnopharmacology* 153:408-423. <https://doi.org/10.1016/j.jep.2014.02.040>
- Teklehaymanot T (2009). Ethnobotanical study of knowledge and medicinal plants use by the people in Dek Island in Ethiopia. *Journal of Ethnopharmacology* 124:69-78. <https://doi.org/10.1016/j.jep.2009.04.005>
- Telefo PB, Lemfack MC, Bayala B, Lienou LL, Goka CS, Yemele CD, ... Moundipa FP (2012). Enquête ethnopharmacologique des plantes utilisées dans le traitement de l'infertilité féminine dans les localités de Fossong-Wentcheng et Foto, Cameroun [Ethnopharmacological survey of plants used in the treatment of female infertility in the localities of Fossong-Wentcheng and Foto, Cameroon]. *Phytotherapie* 10:25-34. <https://doi.org/10.1007/s10298-011-0678-6>
- Thiers B (2016). Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. Retrieved 2020 April 15 from: <http://sweetgum.nybg.org/science/ih/>
- Thomas E, Vandebroek I, Sanca S, Van Damme P (2009). Cultural significance of medicinal plant families and species among the Quechua farmers in Apillapampa, Bolivia. *Journal of Ethnopharmacology* 112:60-67. <https://doi.org/10.1016/j.jep.2008.11.021>
- Tribess B, Melatto G, Alida L, Camargo A, Funez L, Gasper A, Bertarello A (2015). Ethnobotanical study of plants used for therapeutic purposes in the Atlantic Forest region, Southern Brazil. *Journal of Ethnopharmacology* 164:136-146. <https://doi.org/10.1016/j.jep.2015.02.005>
- Trotter RT, Logan MH (1986). Informant census: A new approach for identifying potentially effective medicinal plants. In: Etkin LN (Ed.), *Plants in indigenous medicine and diet*. Redgrave, Bedford Hill, New York.
- Tsobou R, Mapongmetsem PM, Van Damme PM (2013). Medicinal plants used against typhoid fever in Bamboutos division, western Cameroon. *Ethnobotany Research & Applications* 11:163-174.
- Yaseen G, Ahmad M, Sultana S, Alharrasi A, Hussain J, Zafar M, Ur-Rehman S (2015). Ethnobotany of medicinal plants in the Thar Desert (Sindh) of Pakistan. *Journal of Ethnopharmacology* 163:43-59. <https://doi.org/10.1016/j.jep.2014.12.053>
- Yemele MD, Telefo PB, Lieneou LL, Tagne SR, Fodouop CSP, Gpka CS, Lemfack MC, Moundipa FP (2015). Ethnobotanical survey of medicinal plants used for pregnant women's health conditions in Menoua division-west Cameroon. *Journal of Ethnopharmacology* 160:14-31. <https://doi.org/10.1016/j.jep.2014.11.017>



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Supplementary files

**Appendix 1.** List of species used in traditional medicine in Güémez, Tamaulipas, Mexico. Specimens herbarium collected by Sindi J. Gandara (SJG)

Family / Scientific name	Common name	Uses	Part used	Method of use	Numbers of use reports	Use Value (UV)
Amaranthaceae						
<i>Amaranthus palmeri</i> S. Watson (SJG 034)	Quelite	Prevention osteoporosis	Leaves	Cooked and eat	1	0.008
<i>Chenopodium ambrosioides</i> L. (SJG 041)	Epazote	Menstrual colic	Leaves	Boiled, drink solution	10	0.08
		Stomach ache	Leaves	Boiled, drink solution		
		Intestinal parasites	Leaves	Boiled, drink before breakfast		
Anacardiaceae						
<i>Rhus virens</i> Lindh. ex. A. Gray (SJG 67)	Lantrisco	Diabetes	Leaves	Boiled, drink solution	7	0.06
Apiaceae						
<i>Tauschia madrensis</i> J.M. Coult. & Rose (SJG 0126)	Acocotillo	Cough	Leaves	Boiled, drink solution	1	0.008
Apocynaceae						
<i>Cynanchum barbigerum</i> (Scheele) Shinnars (SJG 0115).	Pico de pájaro	Kidney diseases	Root	Boiled, drink solution	1	0.008
Asparagaceae						
<i>Agave celsii</i> Hook. (SJG 0120)	Magüey de peña	Diarrhea	Leaves	Roasted, squeeze and drink juice	11	0.09
		Headache	Leaves	Roasted, squeeze and drink juice		
		Fever	Leaves	Roasted, squeeze and drink juice		
		Internal pains	Leaves	Roasted, squeeze and drink juice		
		Vomit	Leaves	Roasted, squeeze and drink juice		
<i>Agave lechuguilla</i> Torr. (SJG 0121)	Lechuguilla	Kidney diseases	Root	Fermented in water, drink solution	2	0.01
Asphodelaceae						
<i>Aloe vera</i> (L.) Burm. f. (SJG 0121)	Sábila	External wounds	Leaves	Poultice on wound	12	0.1
		Hair loss	Leaves	Cataplasm on hair		
		Anti-inflammatory for stomach	Leaves	Eating raw pieces		
		Rheumatism	Leaves	Cataplasm on affected area		
		Gastritis	Leaves	Eating raw pieces		
		External pains or injuries	Leaves	Cataplasm on affected area		
Asteraceae						
<i>Achillea millefolium</i> L. (SJG 016)	Real de oro	Toothache	Leaves	Boiled, mouthwash	30	0.26
		Stomach ache	Leaves	Boiled, drink solution		
		Vomit	Leaves	Boiled, drink solution		
<i>Ambrosia confertiflora</i> DC. (SJG 047)	Altamisa	Anti-inflammatory stomach	Branch	Boiled, drink solution	2	0.01

Family / Scientific name	Common name	Uses	Part used	Method of use	Numbers of use reports	Use Value (UV)
		Hemorrhoids	Stems and leaves	Moisten and rub on the affected area		
<i>Artemisia ludoviciana</i> Nutt. (SJG 044)	Estafiate	Diarrhea	Leaves	Boiled, drink solution	51	0.44
		Stomach ache	Leaves	Boiled, drink solution		
<i>Bidens pilosa</i> L. (SJG 069)	Pícaro	Kidney diseases	Stems and leaves	Boiled, drink solution	1	0.008
<i>Calyptocarpus vialis</i> Less. (SJG 025)	Hierba de la hormiga	Rash	Stems and leaves	Boiled, wash affected area	1	0.008
		External pains	Stems and leaves	Boiled, wash affected area		
		External wounds	Stems and leaves	Boiled, wash affected area		
<i>Cirsium texanum</i> Buckley (SJG 0123)	Escobilla	Abortive	Leaves and flower	Boiled, drink solution	1	0.008
<i>Matricaria recutita</i> L. (SJG 07)	Manzanilla	Menstrual colic	Stems, leaves and flower	Boiled, drink solution	37	0.32
		Headache	Stems, leaves and flower	Boiled, drink solution		
		Stomach ache	Stems, leaves and flower	Boiled, drink solution		
		External wounds	Stems, leaves and flower	Boiled, wash affected area		
		Flatulence	Stems, leaves and flower	Boiled, drink solution		
		Eye Infection	Stems, leaves and flower	Boiled, make compresses and place on eye		
		Queasiness	Stems, leaves and flower	Boiled, drink solution		
		Dizziness	Stems, leaves and flower	Boiled, drink solution		
		Cough	Stems, leaves and flower	Boiled, drink solution		
		Diarrhea		Boiled, drink solution		
<i>Parthenium hysterophorus</i> L. (SJG 075)	Amargoso	Gastritis	Stems and leaves	Moisten, squeeze and drink solution	4	0.03
<i>Senecio confusus</i> Britten (SJG 0104)	Árnica	External wounds	Leaves and flower	Boiled, wash	23	0.2
		Gastritis	Leaves and flower	Boiled, drink solution		
		Rash	Leaves and flower	Boiled, wash		
<i>Smallanthus maculatus</i> (Cav.) H. Rob. (SJG 0124)	Capitana	External wounds	Leaves	Boiled, wash	1	0.008
<i>Stevia organoides</i> Kunth (SJG 068)	Hierba de la mula	Rheumatism	Leaves	Fermented in alcohol, put in the affected area	1	0.008
<i>Tagetes erecta</i> L. (SJG 0101)	Cempasúchil	Stomach ache	Flower	Boiled, drink solution	2	0.01
<i>Tagetes lucida</i> Cav. (SJG 015)	Hierbanís	Nervousness	Stems, leaves and flower	Boiled, drink solution	4	0.03
<i>Tagetes micrantha</i> Cav. (SJG 029)	Anís	Menstrual colic	Stems, leaves and flower	Boiled, drink solution	1	0.008
<i>Tanacetum parthenium</i> (L.) Sch. Bip. (SJG 012)	Altamis	Diabetes	Leaves	Boiled, drink solution	5	0.04
		Stomach ache	Leaves	Boiled, drink solution		
		Hemorrhoids	Leaves	Boiled, wash		

Family / Scientific name	Common name	Uses	Part used	Method of use	Numbers of use reports	Use Value (UV)
Bignoniaceae						
<i>Crescentia alata</i> Kunth (SJG 0111)	Guajecirial	Bronchia	Fruit	Open the fruit, put some honey and leave to ferment, eat only internal part	1	0.008
Boraginaceae						
<i>Cordia boissieri</i> A. DC. (SJG 091)	Anacahuita	Cough	Fruit	Boiled, drink solution	5	0.04
Burseraceae						
<i>Bursera fagaroides</i> (Kunth) Engl. (SJG 092)	Salsafras	Diabetes	Leaves	Boiled, drink solution	2	0.01
Equisetaceae						
<i>Equisetum hyemale</i> L. (SJG 060)	Cola de caballo	Kidney diseases	Root	Boiled, drink daily as infusion	4	0.03
Ericaceae						
<i>Arctostaphylos pungens</i> Kunth (SJG 072)	Pingüica	Kidney diseases	Root	Fermented in water, drink solution	13	0.11
Euphorbiaceae						
<i>Acalypha lindheimeri</i> Müll. Arg. (SJG 02)	Hierba del cáncer	Prevent cancer	Leaves and flower	Boiled, drink solution	5	0.04
		External pains	Leaves and flower	Boiled, wash		
		External wounds	Leaves and flower	Boiled, wash		
		Rash	Leaves and flower	Boiled, wash		
		Stomach ache	Leaves and flower	Boiled, drink solution		
<i>Cnidocolus aconitifolius</i> (Mill.) I.M. Johnst. (SJG 088)	Chaya	Gastritis	Leaves	Macerated in water, drink solution	3	0.02
<i>Cnidocolus texanus</i> (Müll. Arg.) small (SJG 081)	Mano santa	Kidney diseases	Leaves	Boiled, drink solution	1	0.008
<i>Croton incanus</i> Kunth (SJG 051)	Palillo	Ringworm	Leaves	Macerated, put on the affected area	1	0.008
<i>Croton suaveolens</i> Torr. (SJG 107)	Salvia	Gastritis	Leaves	Boiled, drink solution	19	0.16
		Anaemia	Leaves	Boiled, drink solution		
		Menstrual colic	Leaves	Boiled, drink solution		
<i>Euphorbia prostrata</i> Aiton. (SJG 066)	Hierba de la golondrina	Gastritis	Steam, leaves and flower	Boiled, drink solution	4	0.03
		Rash	Steam, leaves and flower	Boiled, wash		
Fabaceae						
<i>Ebenopsis ebano</i> (Berland.) Barneby & J.W. Grimes (SJG 0109)	Ébano	Diarrhea	Tree bark	Boiled, drink solution	2	0.01
		Antioxidants	Seed	Boiled or toasted		
		Diabetes	Seed	Boiled or toasted		

Family / Scientific name	Common name	Uses	Part used	Method of use	Numbers of use reports	Use Value (UV)
<i>Dalea scandens</i> (Mill.) R.T. Clausen (SJG 0114)	Hierba del burro	Hemorrhoids	Leaves	Boiled, drink solution	1	0.008
<i>Prosopis glandulosa</i> Torr. (SJG 099)	Mezquite	Diarrhea	Tree bark and fruit peel	Boiled, drink solution	5	0.04
<i>Senna</i> sp. Mill. (SJG 087)	Palo santo	Foot Fungi	Leaves and flower	Macerated with alcohol, wash	1	0.008
Fagaceae						
<i>Quercus polymorpha</i> Schlttd. & Cham. (SJG 070)	Encino prieto	Diarrhea	Tree bark	Fermented in water, drink solution	2	0.017
		Stomach ache		Fermented in water, drink solution		
		Oral infections		Fermented in water, mouthwash		
		Kidney diseases		Fermented in water, drink solution		
Hydrangeaceae						
<i>Hydrangea macrophylla</i> (Thunb.) Ser. (SJG 020)	Hortensia	Prevent disease (helps the immune system)	Root	Fermented in water, drink solution	1	0.008
Juglandaceae						
<i>Carya illinoensis</i> (Wangenh.) K. Koch. (SJG 0108)	Nogal	Anaemia	Tree bark	Boiled, drink solution	5	0.04
Krameriaceae						
<i>Krameria ramosissima</i> (A. Gray) S. Watson (SJG 0117)	Calderona	Anti-inflammatory of stomach	Leaves	Boiled, drink solution	4	0.03
		Kidney diseases	Root	Boiled, drink daily as infusion		
Lamiaceae						
<i>Hedeoma drummondii</i> Benth. (SJG 064)	Poleo	Insomnia	Leaves	Put under the pillow, released oils can produce relaxation and sleep	5	0.04
		Cough	Leaves	Boiled, drink solution		
<i>Hedeoma palmeri</i> Hemsl. (SJG 045).	Poleo	Insomnia	Leaves	Put under the pillow, released oils can produce relaxation and sleep	3	0.02
		Cough	Leaves	Boiled, drink solution		
<i>Majorana hortensis</i> Moench. (SJG 048)	Mejorana	Stomach ache	Stems and leaves	Boiled, drink solution	1	0.008
<i>Marrubium vulgare</i> L. (SJG 022)	Marrubio	Increases appetite	Leaves	Boiled, drink solution	26	0.22
		Diarrhea	Leaves	Boiled, drink solution		
		Stomach ache	Leaves	Boiled, drink solution		
		Cough	Leaves	Boiled, drink solution		
<i>Mentha x piperita</i> L. (SJG 038)	Menta	Stomach ache	Leaves	Boiled, drink solution	2	0.01
<i>Mentha spicata</i> L. (SJG 017)	Yerbabuena	Menstrual colic	Leaves	Boiled, drink solution	44	0.38

Family / Scientific name	Common name	Uses	Part used	Method of use	Numbers of use reports	Use Value (UV)
		Anti-inflammatory of stomach	Leaves	Boiled, drink solution		
		Toothache	Leaves	Boiled, mouthwash		
		Stomach ache	Leaves	Boiled, drink solution		
		Intestinal parasites	Leaves	Boiled, drink solution		
		Vomit	Leaves	Boiled, drink solution		
<i>Ocimum basilicum</i> L. (SJG 080)	Albacar	Anti-inflammatory of stomach	Leaves	Boiled, drink solution	22	0.19
		Stomach ache	Leaves	Boiled, drink solution		
		Stress	Leaves	Boiled, drink solution		
		Foot Fungi	Leaves	Boiled, wash		
		Remove bad luck and cleanse soul	Leaves	Touching the body of person with leaves		
		Vomit	Leaves	Boiled, drink solution		
		Bad breath	Leaves	Boiled, mouthwash		
		Digestive	Leaves	Boiled, drink solution		
<i>Poliomntha longiflora</i> A. Gray (SJG 053)	Orégano	Cough	Leaves	Boiled, drink solution	19	0.16
<i>Rosmarinus officinalis</i> L. (SJG 05)	Romero	Menstrual colic	Stems and leaves	Boiled, drink solution	16	0.13
		Diarrhea	Stems and leaves	Boiled, drink solution		
		Sunken fontanelle	Stems and leaves	Boiled, put in a vessel, take the baby and place it with the head down, press the palate and touch the solution with the baby's head		
		Stomach ache	Stems and leaves	Boiled, drink solution		
		Rash	Stems and leaves	Boiled, wash		
		Remove bad luck and cleanse soul	Stems and leaves	Touching the body of person with leaves		
<i>Teucrium cubense</i> Jacq. (SJG 040)	Verbena	Diarrhea	Stems and leaves	Boiled, drink solution	13	0.11
		Headache	Stems and leaves	Macerated in water, drink solution		
		Stomach ache	Stems and leaves	Boiled, drink solution		
		Fever	Stems and leaves	Macerated in water, drink solution		
		Rash	Stems and leaves	Boiled, wash		
		Typhoid	Stems and leaves	Macerated in water, drink solution		
		Gastritis	Stems and leaves	Boiled, drink solution		
Lauraceae						
<i>Litsea glaucescens</i> Kunth (SJG 065)	Laurel	Dizziness	Leaves	Boiled, drink solution	3	0.02
Lythraceae						
<i>Punica granatum</i> L. (SJG 073)	Granada	Diarrhea	Fruit peel and leaves	Boiled, drink solution	2	0.01
Malvaceae						
<i>Abutilon fruticosum</i> Guill. & Perr. (SJG 042)	Catana	Kidney diseases	Root	Boiled, drink solution	1	0.008
<i>Malva parviflora</i> L. (SJG 010)	Malva	External wounds	Leaves	Boiled, wash	3	0.02



Family / Scientific name	Common name	Uses	Part used	Method of use	Numbers of use reports	Use Value (UV)
		Removing thorns	Leaves	Boiled, put the solution several times with a flannel in the affected area		
		External pains	Leaves	Boiled, put the solution several times with a flannel in the affected area		
Meliaceae						
<i>Azadirachta indica</i> A. Juss. (SJG 056)	Nim	Diabetes	Leaves	Boiled, 2 or 3 leaves, drink solution	26	0.22
		Stomach ache	Leaves	Boiled, 2 or 3 leaves, drink solution		
		Foot Fungi	Leaves	Boiled and wash		
Moraceae						
<i>Ficus carica</i> L. (SJG 032)	Higo	Varicose veins	Fruit	Macerated, like cataplasm	1	0.008
Moringaceae						
<i>Moringa oleifera</i> Lam. (SJG 082)	Moringa	Diabetes	Leaves	Boiled, drink solution	1	0.008
Myrtaceae						
<i>Eucalyptus globulus</i> Labill. (SJG 097)	Eucalipto	Cough	Leaves	Boiled, drink solution	15	0.13
<i>Psidium guajava</i> L. (SJG 0106)	Guayaba	Diarrhea	Leaves	Boiled, drink solution	25	0.21
		Stomach ache	Leaves	Boiled, drink solution		
Nyctaginaceae						
<i>Boerhavia spicata</i> Choisy (SJG 057)	Hierba de la hormiga	Rash	Stems and leaves	Boiled, wash	3	0.02
		Kidney diseases	Stems and leaves	Boiled, drink solution		
<i>Bougainvillea glabra</i> Choisy (SJG 052)	Buganvilia	Asthma	Flower	Boiled, drink solution	16	0.13
		Cough	Flower	Boiled, drink solution		
Onagraceae						
<i>Oenothera brachycarpa</i> A. Gray (SJG 0113)	Hierba de la culebra	Herpes virus	Leaves	Cooked, macerated as cataplasm	1	0.008
<i>Oenothera rosea</i> L'Hér. ex Aiton (SJG 059)	Hierba del golpe	Bangs	Leaves	Macerated, like cataplasm	7	0.06
Papaveraceae						
<i>Argemone mexicana</i> L. (SJG 011)	Chicalote	Eye Infection	Sap	Mix with milk, smear on the eyes	1	0.008
Passifloraceae						
<i>Turnera diffusa</i> Willd. ex Schult. (SJG 0116)	Hierba del venado	Fertility	Stems and leaves	Boiled, drink solution	3	0.02
Poaceae						
<i>Cymbopogon citratus</i> (DC.) Stapf (SJG 039)	Zacate limón	Anti-inflammatory of stomach	Leaves	Boiled, drink solution	8	0.06
		Vomit	Leaves	Boiled, drink solution		
<i>Cynodon dactylon</i> (L.) Pers. (SJG 027)	Gramilla	Digestive	Stems and leaves	Mix with chamomile and rue, apply some heat, place on a flannel with ashes and pieces of brick, put over the stomach	3	0.02

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Rosaceae						
<i>Crataegus tracyi</i> Ashe ex Eggl. (SJG 0126)	Tejocote	Kidney diseases	Root	Fermented in water, drink solution	6	0.05
<i>Rosa gallica</i> L. (SJG 0102)	Rosa de castilla	Diarrhea	Flower	Boiled, drink solution	5	0.04
		Stomach ache	Flower	Boiled, drink solution		
Rubiaceae						
<i>Randia rhagocarpa</i> Standl. (SJG 0103)	Brasil	Diabetes	Stems and leaves	Boiled, drink solution	2	0.01
Rutaceae						
<i>Citrus</i> sp. L. (SJG 086)	Naranja agrio	Nervous	Leaves	Boiled, drink solution	1	0.008
		Insomnia	Leaves	Boiled, drink solution		
		Cough	Leaves	Boiled, drink solution		
<i>Murraya paniculata</i> (L.) Jack (SJG 084)	Limonaria	Diabetes	Stems and leaves	Boiled, drink solution	1	0.008
		Intestinal parasites	Stems and leaves	Boiled, drink solution		
<i>Ruta graveolens</i> L. (SJG 030)	Ruda	Menstrual colic	Stems and leaves	Boiled, drink solution	28	0.2
		Digestive	Stems and leaves	Boiled, drink solution		
		Headache	Stems and leaves	Boiled, drink solution		
		Stomach ache	Stems and leaves	Boiled, drink solution		
		Dizziness	Stems and leaves	Boiled, drink solution		
		Remove bad luck and cleanse soul	Stems and leaves	Touching the body of the person with leaves and inhale the steam boiled leaves		
Abortive	Stems and leaves	Boiled, drink solution				
<i>Zanthoxylum fagara</i> (L.) Sarg. (SJG 0122)	Uña de gato	Kidney diseases	Tree bark	Boiled, drink solution	1	0.008
Scrophulariaceae						
<i>Leucophyllum revolutum</i> Rzed. (SJG 049)	Cenizo	Rash	Stems and leaves	Boiled, wash	3	0.02
		Stomach ache	Stems and leaves	Boiled, drink solution		
Selaginellaceae						
<i>Selaginella lepidophylla</i> (Hook. & Grev.) Spring (SJG 06)	Flor de peña	Kidney diseases	Whole plant	Fermented in water, drink solution	5	0.04
		Urinary infections	Whole plant	Fermented in water, drink solution		
		Ulcers	Whole plant	Fermented in water, drink solution		
Simaroubaceae						
<i>Castela erecta</i> Turpin (SJG 076)	Bizbirinda	Constipation	Stems and leaves	Boiled, drink solution	13	0.11
		Stomach ache	Stems and leaves	Boiled, drink solution		
Smilacaceae						
<i>Smilax bona-nox</i> L. (SJG 058)	Hierba del ojo	Remove bad luck and cleanse soul	Stems and leaves	Touching the body of person with leaves	3	0.02
Solanaceae						
<i>Cestrum tomentosum</i> L.f. (SJG 019)	Palo hediondo	Remove bad luck and cleanse soul	Stems and leaves	Touching the body of person with leaves	5	0.04
		Rash	Leaves	Macerated, wash with solution		

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<i>Solanum americanum</i> Mill. (SJG 01)	Hierba mora	External wounds	Steam, leaves and flower	Boiled, mouthwash	1	0.008
Verbenaceae						
<i>Aloysia citriodora</i> Palau (SJG 062)	Cedrón de castilla	Stomach ache	Leaves	Boiled, drink solution	3	0.02
<i>Glandularia bipinnatifida</i> (Schauer) Nutt. (SJG 063)	Moradilla	Remove bad luck and cleanse soul	Whole plant	Touching the body of the person with leaves then put these in water, if the water consistency is gelatinous, the evil will come out	2	0.01
		Hair loss	Whole plant	Macerated, wash hair daily		
Viburnaceae						
<i>Sambucus nigra</i> L. (SJG 031)	Sauco	Cough	Flower	Boiled, drink solution	3	0.02