

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA



Fourteenth meeting of the Conference of the Parties
The Hague (Netherlands), 3-15 June 2007

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

Deletion of *Pereskiaopsis* spp. from Appendix II.

B. Proponent

Mexico

C. Supporting statement

1. Taxonomy

1.1 Class: Magnoliopsida

1.2 Order: Caryophyllales

1.3 Family: Cactaceae Juss

1.4 Genus, species or subspecies, including author and year: *Pereskiaopsis* Britton & Ros, 1907

1.5 Scientific synonyms:

and

1.6 Common names:

Scientific name	Scientific synonyms	Common names
<i>Pereskiaopsis aquosa</i> (F.A.C. Weber) Britton & Rose	<i>Opuntia aquosa</i> F.A.C. Weber	'Tuna de agua', 'alfilerillo', 'chirriocillo' in Jalisco and Nayarit, 'tasajillo' (http://www.desert-tropicals.com/Plants/Cactaceae/Pereskiaopsis.html)
<i>Pereskiaopsis blakeana</i> J.G. Ortega	none	'Joconoxtle', 'coconoxtle' in Sinaloa

Scientific name	Scientific synonyms	Common names
<i>Pereskiopsis porteri</i> (K. Brandegee ex F.A.C. Weber) Britton & Rose	<i>Opuntia porteri</i> K. Brandegee ex F.A.C. Weber, 1898; <i>Opuntia rotundifolia</i> Brandegee, 1891; <i>Opuntia bradegeei</i> K. Schum., 1898; <i>Pereskiopsis brandegeei</i> (K. Schum.) Britton & Rose, 1907; <i>Pereskiopsis gatesii</i> E.M. Baxter, 1932	'Alcajer' or 'alcanjer' in Baja California Sur
<i>Pereskiopsis rotundifolia</i> (DC.) Britton & Rose	<i>Pereskia rotundifolia</i> DC., 1828; <i>Opuntia rotundifolia</i> (DC.) K. Schum., 1898; <i>Opuntia chapistle</i> F.A.C. Weber in Gosselin, 1904; <i>Pereskiopsis chapistle</i> (F.A.C. Weber) Britton & Rose, 1907	'Chapistle', 'chapixtle', 'chepistle' in Oaxaca
<i>Pereskiopsis diguetii</i> (F.A.C. Weber) Britton & Rose	<i>Opuntia diguetii</i> F.A.C. Weber. <i>Pereskiopsis velutina</i> Rose. <i>Perskiopsis spathulata</i> (Pfeiff.) Britton & Rose	'Alfilerillo', 'patilón' and 'tasajillo' in Jalisco
<i>Pereskiopsis kellermanii</i> Rose in Britton & Rose	<i>Pereskiopsis scandens</i> Britton & Rose, 1923; <i>Pereskia scandens</i> (Britton & Rose) Standl., 1930	'Cola-lagarto' in Oaxaca

1.7 Code numbers: Not applicable – there is no data sheet for these species in the CITES Identification Manual.

2. Overview

Delisting these species from the CITES Appendices will have no negative impact, either on the species themselves or on other cactus species, because there is virtually no national or international trade in any of the six species. Moreover, there is no evidence of illegal trade, nor any evidence that these species constitute an intensely used resource. They are a group that is easily distinguished from other cacti, and none of the six species is threatened. The Plants Committee, at its 16th meeting, held in Lima, Peru, in July 2006, reviewed and agreed to support this proposed amendment to delete the genus *Pereskiopsis* from the CITES Appendices.

3. Species characteristics

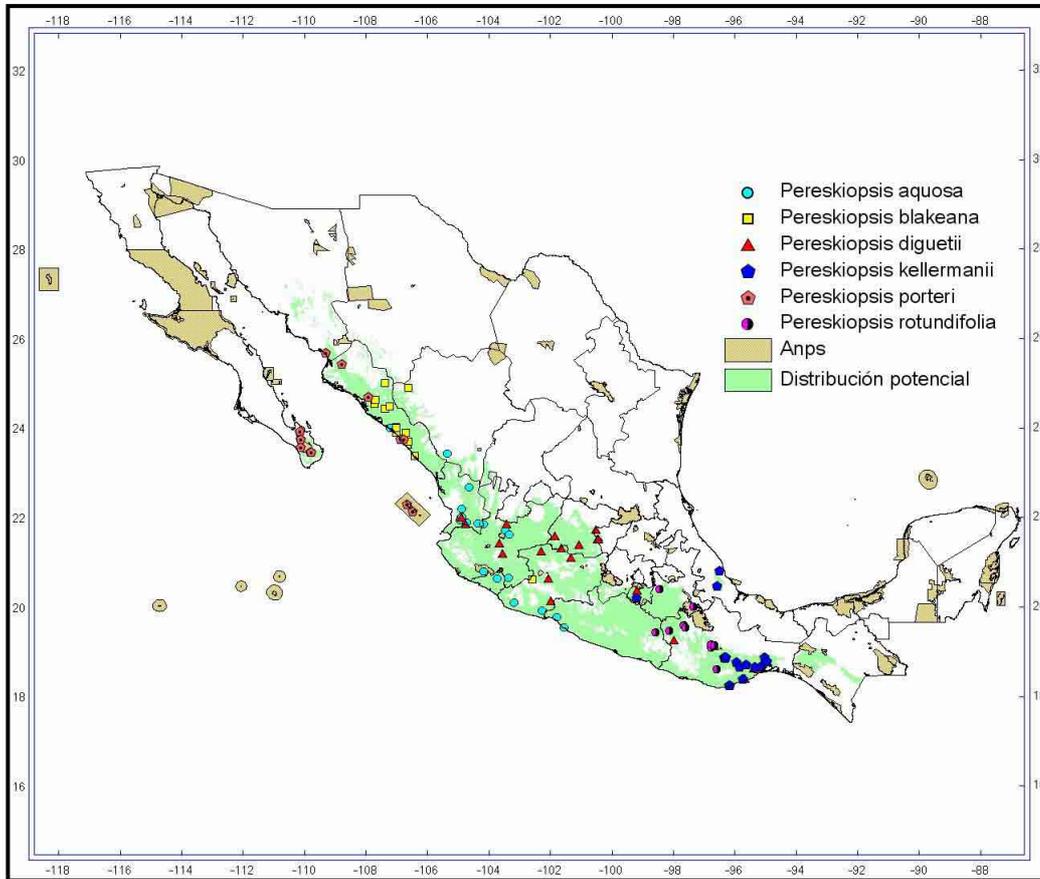
3.1 Distribution

Most species of the genus *Pereskiopsis* are endemic to Mexico, with the exception of *Pereskiopsis kellermanii*, whose range extends as far as Jalapa and Santa Rosa in Guatemala.

The genus is found throughout most of the country, although most species are distributed in the western, central and southern regions of Mexico. Only *P. blakeana* and *P. porteri* are found in

the north, the latter extending into the States of Baja California Sur, Sonora and Sinaloa (see Figure 1).

Figure 1. Potential distribution and recorded collection sites of specimens of *Pereskia* spp. (Beige-shaded areas are Federal Natural Protected Areas (ANPs). Green-shaded areas are potential distribution areas).



3.2 Habitat

The genus *Pereskia* is distributed in low deciduous forests, also known as tropical deciduous forests, and in the deciduous thorn forests along the Pacific coast, from Baja California to the Isthmus of Tehuantepec (Bravo-Hollis 1978). The tropical deciduous forests are characterized by marked climatic seasonality, with a rainy season (June-September), during which the vegetation is exuberantly green, and a dry season (October-May), during which most species lose their leaves (Rzedowski 1978). Some species may also be found in thorn forests of *Quercus* and xerophilous shrubs, and even in roadside areas, as is the case of *Pereskia diguetii*. The genus has a wide altitudinal range, with some species existing at sea level (*P. porteri*), while others grow at 1900 metres above sea level (such as *P. rotundifolia*). Habitat availability is not considered a limiting factor.

3.3 Biological characteristics

Like other cacti, the genus *Pereskia* has perfect, or bisexual, flowers and reproduces by cross-pollination. The plants flower between March and August and are pollinated by bees (melittophily) or, in some cases, butterflies.

In addition, the areoles that cover the pericarp of the fruit can produce buds when the fruit falls to the ground and comes into contact with soil. This may be an asexual reproduction strategy that enables several species of the genus to grow in disturbed environments.

3.4 Morphological characteristics

Shrubs or vines ranging from 0.5 to 4 m in height with a stem 2 to 16 cm wide which becomes woody when old and is sometimes covered with greyish-brown or yellowish-brown bark. Well-developed leaves, 2 to 6 cm long and 1 to 4 cm wide, deciduous, with palmate venation. Areoles measure 1.5 to 5 mm in length and have spines, hair and glochids (barbed hairs).

Flowers have rotate perianth, inferior ovary, sessile pericarpal, with or without bracts on the areoles, and are vespertine. Fruit is reddish-orange, generally small, of various shapes – oblong, elongated conical, clavate – and has areoles with abundant reddish glochids. Seeds have a hard testa, covered with fine white hair. The flowering period is between March and August (Bravo-Hollis 1978). See botanical description in the Annex.

3.5 Role of the species in its ecosystem

There is no background on the function of these species in their ecosystem, and studies of their reproductive biology and their relationship to the ecosystem are therefore needed. Generalist frugivores may act as seed dispersal agents, but it is not known definitely whether this is the case.

From the standpoint of plant community physiognomy, most of these species inhabit the arboreal stratum of the tropical deciduous forest. However, in the case of species such as *P. diguetii*, under moderately disturbed conditions, dispersal and establishment may increase and the plant may be found in roadside areas.

4. Status and trends

4.1 Habitat trends

García-Peña (2001) notes that tropical deciduous forests cover 11 million hectares and are found mainly on the coastal plains of the Pacific coast, the Isthmus of Tehuantepec, and the northern portion of the Yucatan Peninsula. He also mentions that there are extensive areas of fragmented tropical forest spread over slightly more than 6.7 million hectares, located mainly in the coastal areas of the Yucatan Peninsula.

The original area of these communities covered between 8 % and 14 % of the national territory (Rzedowski 1978; Trejo and Dirzo 2000); however, the forest cover has been reduced considerably as agricultural activity has increased (30 % between 1970 and 1990), as has ranching (25 % to 67 %) (Trejo and Dirzo 2000).

In 1966, Rzedowski and McVaugh found that tropical deciduous and thorn forests remained relatively undisturbed and that dense communities continued to exist in comparison with mesophilous and gallery forests in those areas of the country. However, Vázquez et al. (1992) observed that deciduous tropical forests could be a declining ecosystem because they are susceptible to rapid deforestation through fire.

Few studies exist on changes or deterioration of the communities in western Mexico where *P. aquosa* lives, of the communities of deciduous tropical forests in north-western Mexico where *P. blakeana* is found, of the communities in western Mexico where *P. diguetii* is found or north-eastern Mexico where *P. porteri* is found, although there is information indicating that the main threat to the latter is the introduction of exotic species. (http://www.ine.gob.mx/dgoece/con_eco/conhc/islas.html).

Pereskiaopsis rotundifolia is distributed both in low-disturbance areas, such as Zimatán (Salas-Morales et al. 2003) and Cerro Guiengola in Oaxaca (Torres 1989), and in places near areas of human activity (farms, ranches, population centres, roads, etc.) in the States of Guerrero, Morelos, México and Puebla.

As for the habitat of *P. kellermanii*, it is known that some populations are found in low-disturbance areas such as Nizanda, Oaxaca (Pérez-García and Meave 2004), but the species also inhabits more disturbed places, such as Tehuantepec and Totolapan.

4.2 Population size

There is no information on the size of *Pereskiopsis* spp. populations.

4.3 Population structure

There is no information on the structure of *Pereskiopsis* spp. populations.

4.4 Population trends

There is no information on *Pereskiopsis* spp. population trends.

4.5 Geographic trends

The floristic and taxonomic studies examined indicate that *P. aquosa* is present in the western part of the country, in the States of Jalisco, Michoacán, Nayarit and Durango, and it is now known that its distribution is continuous as far as the State of Guerrero. In the case of *P. rotundifolia*, studies show the presence of very rare wild populations, apparently limited to the Mixteca region in Oaxaca (Arias, 1996, Salas-Morales, 2003 and Torres, 1989), but it exists as a cultivated or introduced species in southern Mexico, in the States of Guerrero, México, Morelos, Oaxaca and Puebla. Concerning *P. diguetii*, the studies show the presence of the species in the west, in the States of Guanajuato, Guerrero, Jalisco, México, Michoacán, Morelos, Nayarit, Oaxaca and Querétaro. In addition, a study of by Bárcenas (1999) on distribution patterns of different cactus species in the State of Guanajuato found that the distribution of *P. diguetii* is discontinuous, with the species growing on either side of the neo-volcanic belt and extending into the arid areas of Puebla and Oaxaca.

As for *Pereskiopsis blakeana*, Arias (1996) found that it is a species with discontinuous distribution, and that the largest populations are in Sinaloa and Durango on plains and on the sloping banks of streams and rivers that flow from the Western Sierra Madre mountains and further south in the lower Balsas river basin. With regard to the geographic trend of *Pereskiopsis kellermanii* in Mexico, this species is distributed in southern and south-eastern Mexico, in the States of Chiapas, Guerrero, Morelos, Oaxaca, Veracruz and Yucatán.

5. Threats

None of the species faces any direct threat, such as selective collection, since they are not of ornamental value. Moreover, most of the species of this genus may benefit to some extent from disturbances, as evidenced by the fact that they can be found even along roadsides.

6. Utilization and trade

6.1 National utilization

Pereskiopsis aquosa is the only species of the genus whose fruits are edible; they have a large amount of pulp and an aroma similar to that of an apple. Diguét (1928) observed that the fruit was eaten raw, pureed to make fruit drinks, cooked liked vegetables or stewed in sugar or honey to make a compote. The same author noted that the species was cultivated in some indigenous regions of Jalisco and Nayarit as a fruit tree and that the mature fruits could be found in small local markets. However, its use in recent times has diminished considerably. The SEMARNAT webpage (http://www.semarnat.gob.mx/pfnm3/fichas/pereskiopsis_aquosa.htm) indicates that the species has medicinal uses, but does not mention the source of this information or the region in which the leaves are used in folk medicine. The leaves of *P. rotundifolia* are chewed by some people in Mexico to treat mouth ulcers (Arias, personal communication).

Pereskiopsis aquosa, *P. porteri*, *P. rotundifolia* and *P. diguetii* are sometimes used as 'living fences' in gardens and backyards in some communities in the States of Jalisco, Guerrero, México, Morelos, Oaxaca and Puebla (Arias, personal communication).

The fruit of *Pereskiopsis blakeana* has a soft pulp that could be eaten, but abundant glochids on its surface make its use as a food impractical (Arias 1993; González Ortega 1929).

Lastly, regarding *P. kellermanii*, there are no records or information on the use of any part of the plant.

6.2 Legal trade

For the trade analysis, the trade databases of the Directorate-General for Wildlife, Environment and Natural Resources Division (*Dirección General de Vida Silvestre, Secretaría de Medio Ambiente y Recursos Naturales*, DGVS-SEMARNAT), Mexico's CITES Management Authority, and information on net exports in the online database of the UNEP Conservation Monitoring Centre (UNEP-WCMC) were reviewed.

All records from 1990 to 2005 were reviewed. The UNEP-WCMC database contains records of exports of a total of 97 *Pereskiopsis diguetii* individuals and three *P. rotundifolia* individuals propagated artificially, as well as another 17 individuals propagated artificially for commercial purposes under the name *Pereskiopsis* spp. There is no information on international trade in the other species of the genus, which would appear to indicate that this genus has no significant market value or presence.

6.3 Parts and derivatives in trade

According to the information reported in the UNEP-WCMC database, on the few occasions that specimens of any of the species have been traded, they have been sold as live plants.

6.4 Illegal trade

The information contained in the illegal trade databases (1990-2005) of the Federal Legal Office for Environmental Protection (*Procuraduría Federal de Protección al Ambiente*, PROFEPA-SEMARNAT), Mexico's CITES Enforcement Authority, was analysed and no record was found of any illegal trade in the species.

The UNEP-WCMC database was also checked, and one record was found of the export of an individual of illegal origin under the name *Pereskiopsis spathulata*, a synonym for *Pereskiopsis diguetii*, in 2000, from Poland to the Czech Republic.

6.5 Actual or potential trade impacts

Because trade in the species in question is virtually nonexistent, there is no information on impacts of its exploitation, and it is considered that trade poses no potential risk to the species.

7. Legal instruments

7.1 National

None of the species is included in the Mexican endangered species list (Norma Mexicana Oficial NOM-059-SEMARNAT-2001), which establishes the degree of protection required for the country's native wild species.

Under Article 1 of Mexico's General Wildlife Act, sustainable use of timber and non-timber forest resources is regulated by forestry law, unless endangered species or populations listed in NOM-059-SEMARNAT-2001 are involved. Accordingly, the management and use of these species is regulated by the General Sustainable Forestry Development Act, specifically Articles 97, 99 and 100, and by Articles 53 to 61 of its implementing regulations, which establish the requirements, duration of notices and authorizations, as well as the periods of use

of non-timber forest resources, which are determined based on the recovery and regeneration cycles of the species and its useful parts.

Storage centres are required to obtain authorization to operate as such, as established under Article 111 of the regulations. Transported forest products must be accompanied by forestry documentation printed on security paper, certifying that they are of legal origin, in accordance with the provisions of Article 94 of the regulations. In order to keep a record of forest products, Article 115 requires that owners and operators of storage centres and facilities that process forest raw materials must maintain a log of receipt and dispatch of such materials, in either written or electronic form.

Official Mexican Standard NOM-005-SEMARNAT-1997 establishes the procedures, criteria and technical and administrative specifications for the sustainable use, transport and storage of bark, trunks and whole plants of forest vegetation in natural populations. This set of regulations covers groups of plants of the families Bromeliaceae, Cactaceae, Orchidaceae and ferns.

Finally, Official Mexican Standard NOM-126-SEMARNAT-2001 establishes the specifications for scientific collection of biological material from wild species.

Pereskia aquosa, owing to its importance as a food and medicinal plant, is also regulated by Official Mexican Standard NOM-007-SEMARNAT-1997 (for the text of the Standard, see http://www.semarnat.gob.mx/pfnm3/fichas/pereskia_aquosa.htm), which establishes the procedures, criteria and specifications for the use, transport and storage of branches, leaves or stalks, flowers, fruits and seeds.

7.2 International

International trade in this genus has been regulated by the provisions of CITES since 1 July 1975, when it was listed in Appendix II as part of the Cactaceae family.

8. Species management

8.1 Management measures

In 1999, the Mexican Government established the Programme for the Recovery of High-Priority Species (PREP) [*Diario Oficial de la Federación* (Official Gazette) 1999] as part of its Programme for the Conservation of Wildlife and Diversification of Production in the Rural Sector 1997-2000 (SEMARNAP, 1997). PREP aims to draw up a description of the status of populations of high-priority species, the issues affecting them and their realistic possibilities for survival and conservation.

About four years ago, the Technical Advisory Subcommittee for the Conservation of Cactaceae of Mexico was formed. This 45-member body includes representatives from academic life, non-governmental organizations and producers. It has carried out a variety of activities, including the development of a guide to Mexican cacti and the identification of areas of importance for the conservation of cacti and other Mexican succulents.

8.2 Population monitoring

In accordance with the General Sustainable Forestry Development Act, PROFEPA is the institution responsible for forestry monitoring and inspection activities. The Act also establishes the fines and penalties for violators.

No specific operations have been conducted for these species, but there are general operations for other species.

8.3 Control measures

8.3.1 International

International control measures are applied through DGVS-SEMARNAT, which is the authority that issues CITES permits and certificates, and PROFEPA-SEMARNAT, which is responsible for enforcing CITES throughout Mexico; for that purpose, it operates 72 inspection points at ports, airports and borders and employs 83 federal inspectors.

8.3.2 Domestic

Control measures are carried out by PROFEPA-SEMARNAT, Mexico's CITES Enforcement Authority.

The genus is protected under Mexican laws such as the General Wildlife Act and the Federal Criminal Code, which makes it a crime to engage in any activity for the purpose of trafficking, capturing, possessing, transporting, storing or extracting any specimen, product or by-product of these species. Because these species are listed in the CITES Appendices, PROFEPA conducts annual programmes and special operations to control illegal trafficking of wildlife in the main distribution and sales centres in the country.

8.4 Artificial propagation

The information held by DGVS-SEMARNAT (Management Authority) on Units for the Management, Conservation and Sustainable Use of Wildlife (UMA) was reviewed and no information was found on nurseries that cultivate these species commercially.

The few trade records found in the UNEP-WCMC database on individuals propagated artificially concerned plants from Germany, Spain and Thailand.

8.5 Habitat conservation

Pereskioopsis aquosa grows in the Sierra de Manantlán Biosphere Reserve in the State of Jalisco, *P. porteri* in the Sierra La Laguna Biosphere Reserve in Baja California Sur and *P. kellermanii* in the Cuxtal Ecological Reserve in the State of Yucatán and in Huatulco National Park in the State of Oaxaca.

As for *P. blakeana*, *P. rotundifolia* and *P. diguetii*, none of the collection sites on record for these species is within any protected natural area (ANP); however, the potential distribution identified for each of them using Desktop GARP suggests the presence of *P. blakeana* in the Sierra de Álamos-Río Cuchujaqui Flora and Fauna Protection Areas in the State of Sonora, on the Cacaxtla plateau in Sinaloa, and in the La Michilía Biosphere Reserve in Durango; of *P. rotundifolia* in the Tehuacán-Cuicatlán Biosphere Reserve and of *P. diguetii* in the Monarch Butterfly Biosphere Reserve (Michoacán), Chamela-Cuixmala Biosphere Reserve (Jalisco) and Sierra de Manantlán Biosphere Reserve (Jalisco); in the Sierra de Quila (Jalisco) and La Primavera (Jalisco) Flora and Fauna Protection Areas; in Pico de Tancitaro National Park in Michoacán and in the Natural Resource Protection Area in the river basin of the Valle de Bravo, Malacatepec, Tilostoc and Temascaltepec rivers in the States of México and Michoacán.

8.6 Safeguards

Deletion of the genus *Pereskioopsis* from the CITES Appendices is not expected to cause any problem that would threaten the species in question because there is virtually no national or international trade in these species. Furthermore, as stated above, there is an adequate regulatory scheme in effect for the use of and trade in wildlife, which would ensure their conservation and sustainable use if needed.

It is not expected that other species included in the Appendices would be affected as this is a comparatively well-differentiated taxon.

9. Information on similar species

Plants of the genera *Peresklopsis* and *Pereskia* are easily distinguished from other cacti by their growth habit and by the presence of leaves (Bravo-Hollis 1978). The visual characteristics that differentiate the genus *Peresklopsis* from the genus *Pereskia* are as follows: *Peresklopsis* has branches without a peridermis (green in colour) and with glochids, while *Pereskia* has branches with a peridermis (brown) and without glochids.

The presence of areoles on which spines grow is a characteristic which distinguishes these species from other similar plants not belonging to the Cactaceae family.

10. Consultations

Most of the genus *Peresklopsis* is endemic to Mexico, the exception being *P. kellermanii*, whose range extends into Guatemala. The CITES Authorities of Guatemala were consulted, and they expressed their support for the proposal to delete these species from the CITES Appendices.

11. Additional remarks

At its 16th meeting, the Plants Committee reviewed and agreed to support the proposed amendment to remove the genus *Peresklopsis* from the CITES Appendices.

12. References

- Arias-Montes, S. 1996. Revisión taxonómica del género *Peresklopsis* Britton & Rose (Cactaceae). Tesis, Facultad de Ciencias, Universidad Nacional Autónoma de México, México, D. F.
- Bárceñas L., R. T. 1999. Patrones de distribución de cactáceas en el Estado de Guanajuato. Tesis de Licenciatura, Facultad de Ciencias, Universidad Nacional Autónoma de México, México, D. F. 25 pp.
- Bravo-Hollis, H. 1978. Las cactáceas de México. 2a. Ed. Vol. 1. Universidad Nacional Autónoma de México, México, D. F. 743 p.
- García-Peña V., E. 2001. Marco institucional, normativo y político para el manejo y comercialización de productos forestales no maderables de México. UNEP-WCMC.
- González Ortega, J. 1929. Flora Indígena de Sinaloa. Bol. Pro-Cult. Reg., Mazatlán 1(1), sin paginación.
- Janzen, D., 1988. Tropical dry forests: The most endangered major tropical ecosystems. In: Wilson, E.O. (Ed.), Biodiversity. National Academy Press, pp. 130-137.
- Pérez-García, E. y J.A. Meave. 2004. Heterogeneity of xerophytic vegetation of limestone outcrops in a tropical deciduous forest region in southern México. Plant Ecology 175: 147-163.
- Rzedowski, J. y R. McVaugh. 1966. La Vegetación de Nueva Galicia. Contributions University of Michigan Herbarium 9(1):1-123
- Rzedowski, J. 1978. La vegetación de México. Limusa, México D.F. 432 pp.
- SEMARNAT 2002. Norma Oficial Mexicana NOM-059-ECOL-2001.
- SEMARNAP. 1997. Programa de Conservación de la Vida Silvestre y Diversificación Productiva en el Sector Rural. Secretaría de Medio Ambiente, Recursos Naturales y Pesca. México, D. F., 207 pp.
- Salas-Morales, S. H., A. Saynes-Vázquez y L. Shibli. 2003. Flora de la costa de Oaxaca, México: Lista florística de la región de Zimatlán. Bol. Soc. Bot. Méx. 72:21-58.
- Salazar, C., V. Parra T., J. E. Malo y M. Carvajal. 2000. Abundancia y biología floral de *Peresklopsis kellermanii* Rose (Cactaceae), en Yucatán, México. XV Congreso Mexicano de Botánica, Querétaro, México.

Torres, C. L. 1989. Estudio florístico y descripción de la vegetación del Cerro Guiengola, en el Istmo de Tehuantepec, Oaxaca. Tesis de licenciatura, Escuela Nacional de Estudios Profesionales Iztacala, Universidad Nacional Autónoma de México, Iztacala. 81 pp.

Trejo I. y R. Dirzo, 2000. Deforestation of seasonally dry tropical forest: a national and local analysis in Mexico. *Biological Conservation* 94 133-142.

Vázquez G., J. A., R. Cuevas G., T. S. Cochrane, H. H. ILDIS, F. J. Santana M. y L. Guzmán H. 1995. Flora de Manantlán. Plantas vasculares de la Reserva de la Biosfera Sierra de Manantlán Jalisco-Colima, México. Sida, Botanical Miscellany, Botanical Research Institute of Texas, Inc., U.S.A. 312 pp.

(http://www.ine.gob.mx/dgoece/con_eco/conhc/islas.html).

(<http://www.desert-tropicals.com/Plants/Cactaceae/Pereskiosis.html>).

http://www.semarnat.gob.mx/pfnm3/fichas/pereskiosis_aquosa.htm.

BOTANICAL DESCRIPTION OF THE GENUS *PERESKIOPSIS*

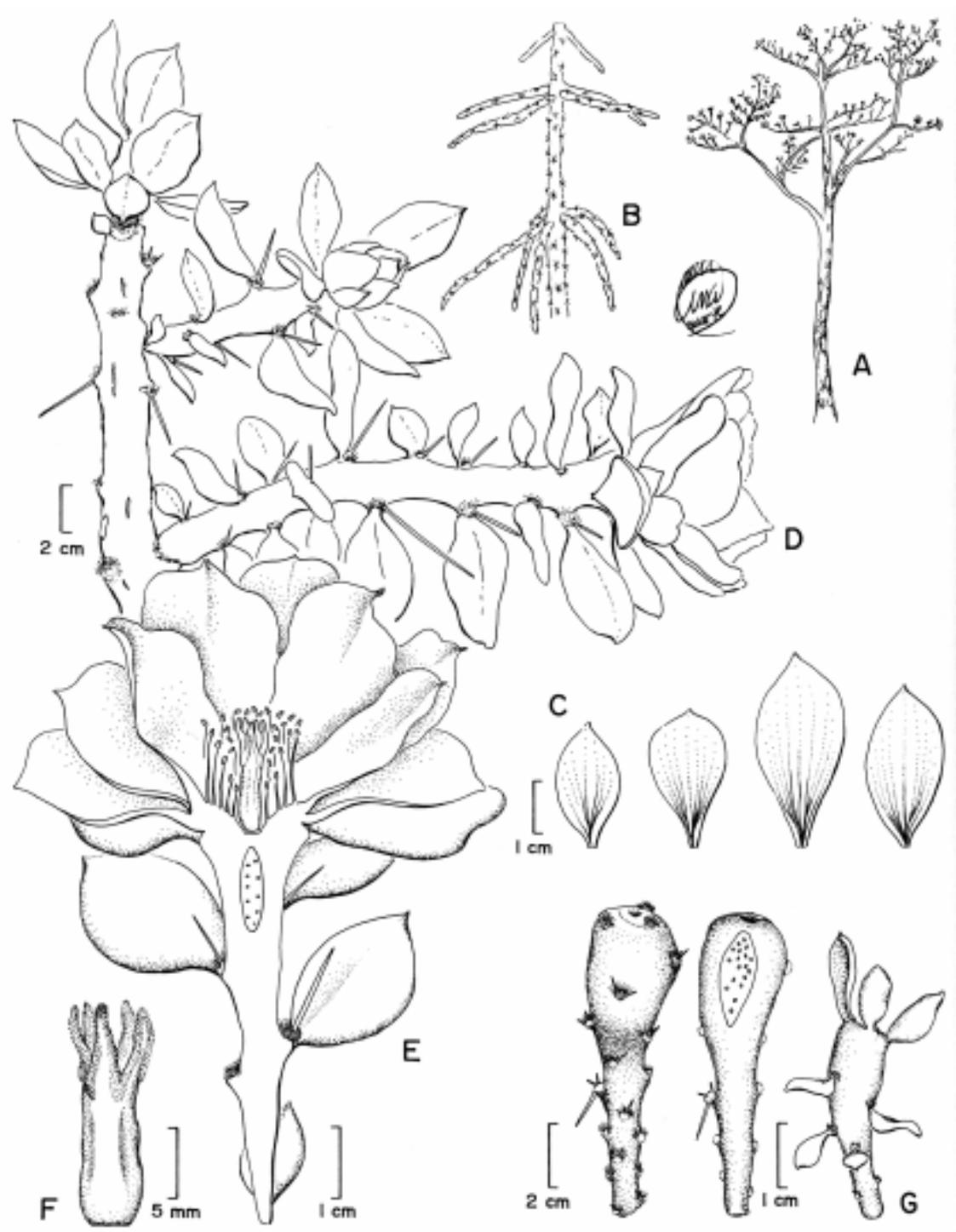


Figure 1. Botanical description of *Pereskiaopsia aquosa*. A. adult plant, arborescent; B. young plant with pseudovercillate ramification; C. leaves; D. branch with flower, external view; E. cross-section of flower showing a long pedicel; F. style; G. fruit, external and internal view, with foliaceous bracts (illustration: Anabel Duarte).

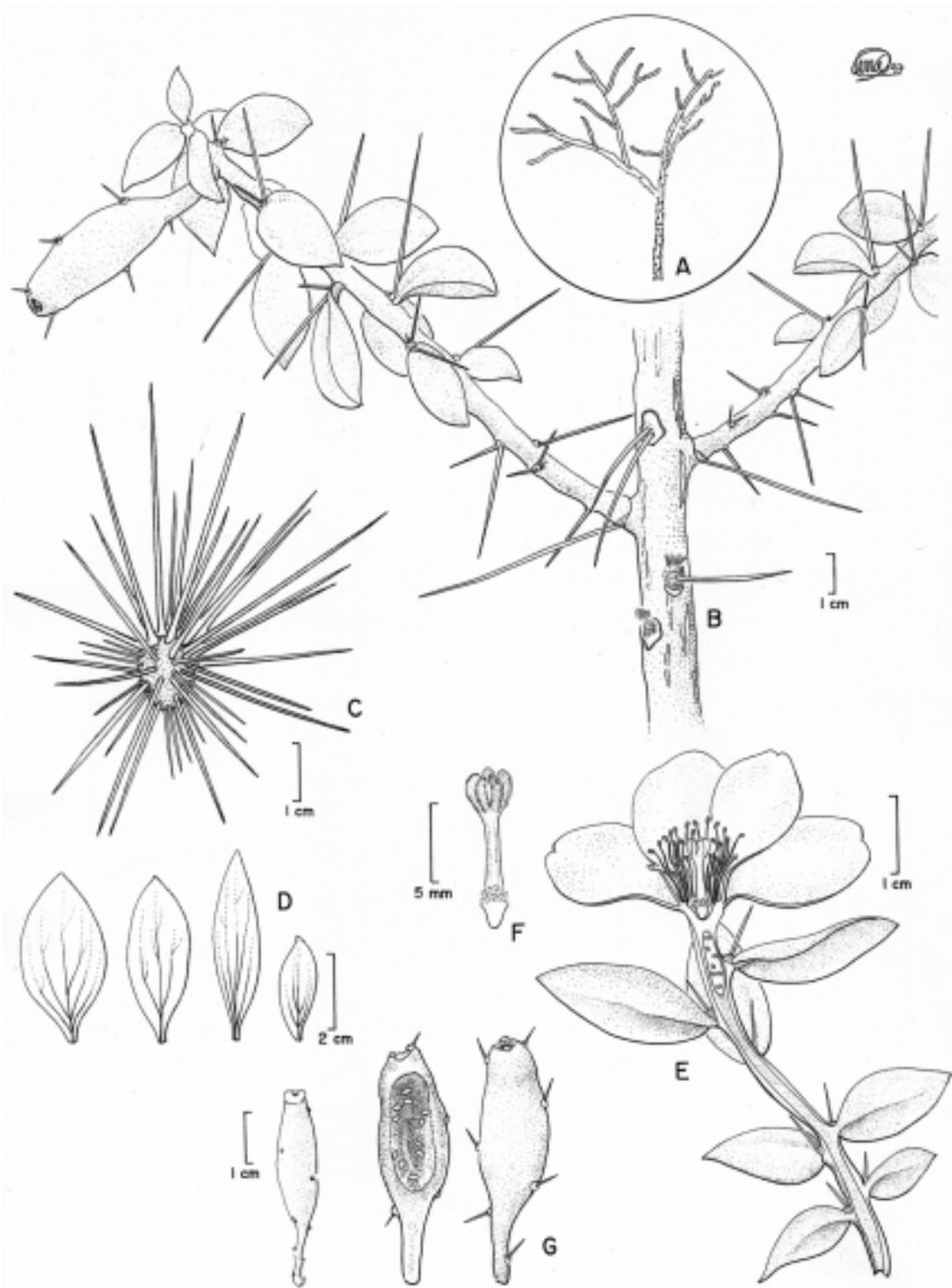


Figure 2. Botanical description of *Pereskia blakeana*. A. adult plant, arborescent, without leaves; B. branch with fruit; C. trunk spines; D. leaves; E. flower cross-section; F. style with trichomes at base; G. fruit, external and internal view (illustration: Anabel Duarte).

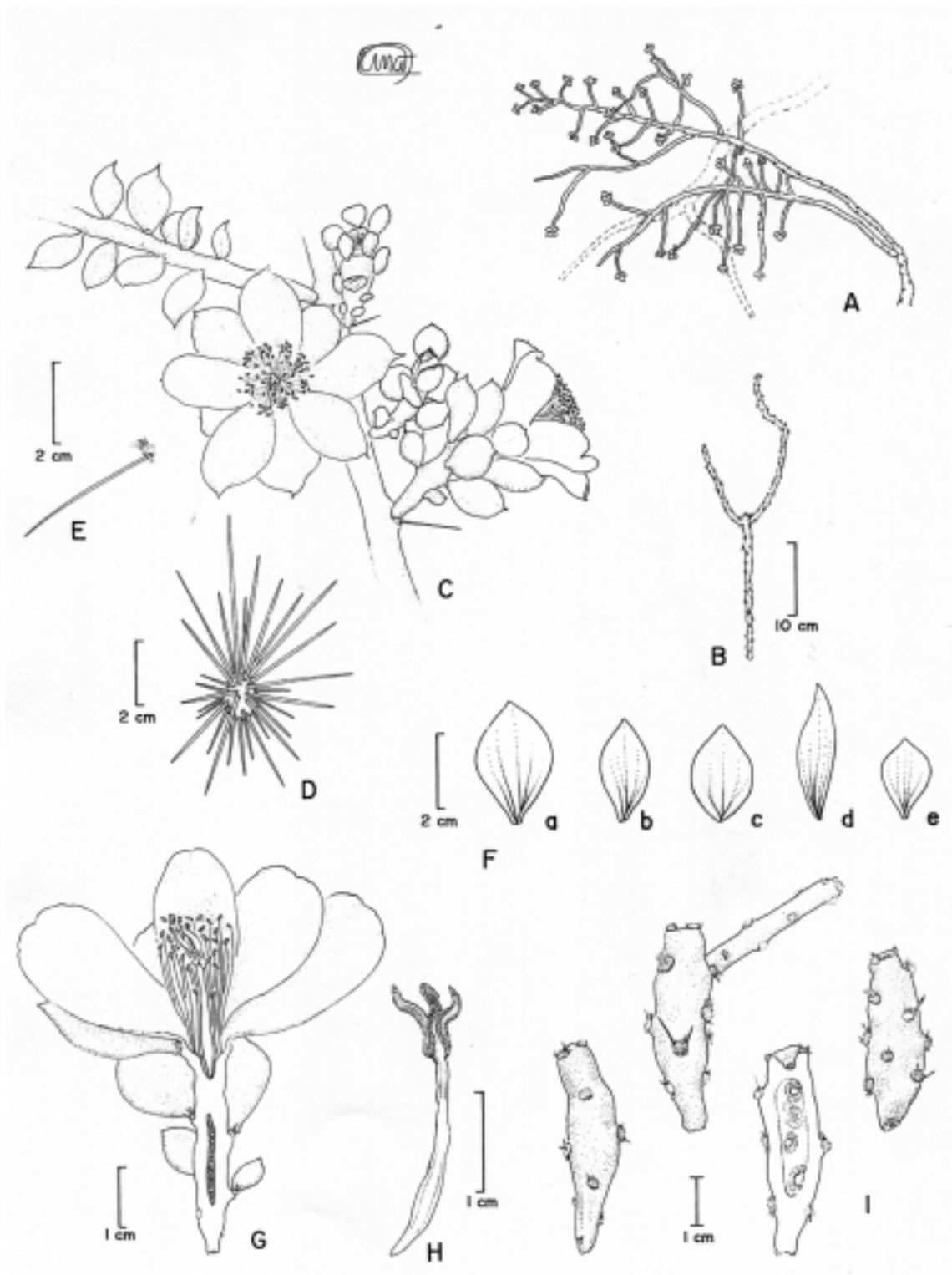


Figure 3. Botanical description of *Pereskia porteri*. A. adult plant, scandent; B. young plant, without leaves; C. branch with flowers; D. trunk spines. E. branch spine; F. leaves. G. longitudinal cross-section of flower; H. style; I. fruit, external and internal view, with a new branch emerging from an areole (illustration: Anabel Duarte).

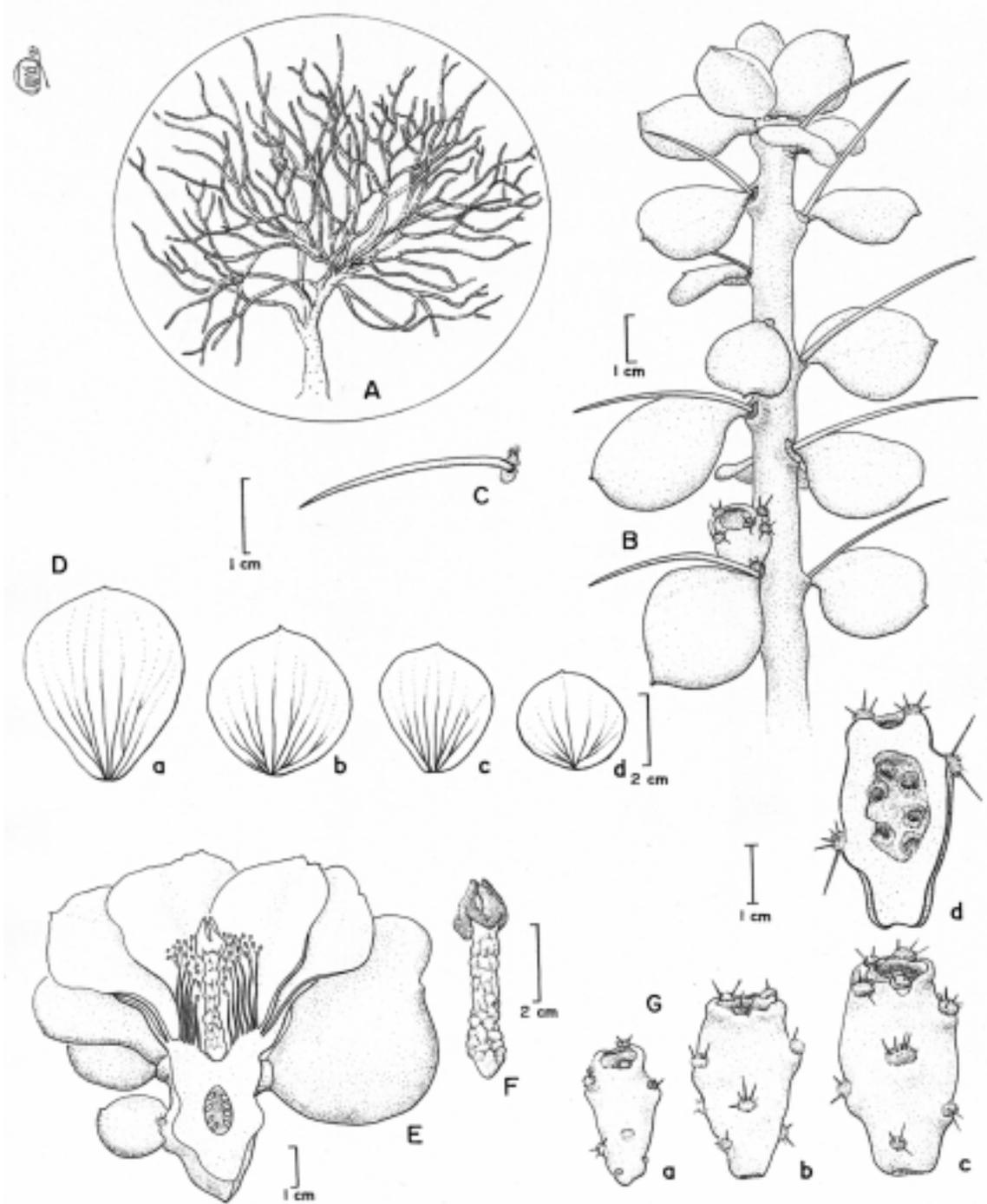


Figure 4. Botanical description of *Pereskia rotundifolia*. A. adult plant, arborescent; B. terminal branch with suborbicular leaves and fruit; C. branch spine; D. leaves; E. longitudinal cross-section of flower; F. style; G. fruit, external and internal view (illustration: Anabel Duarte).

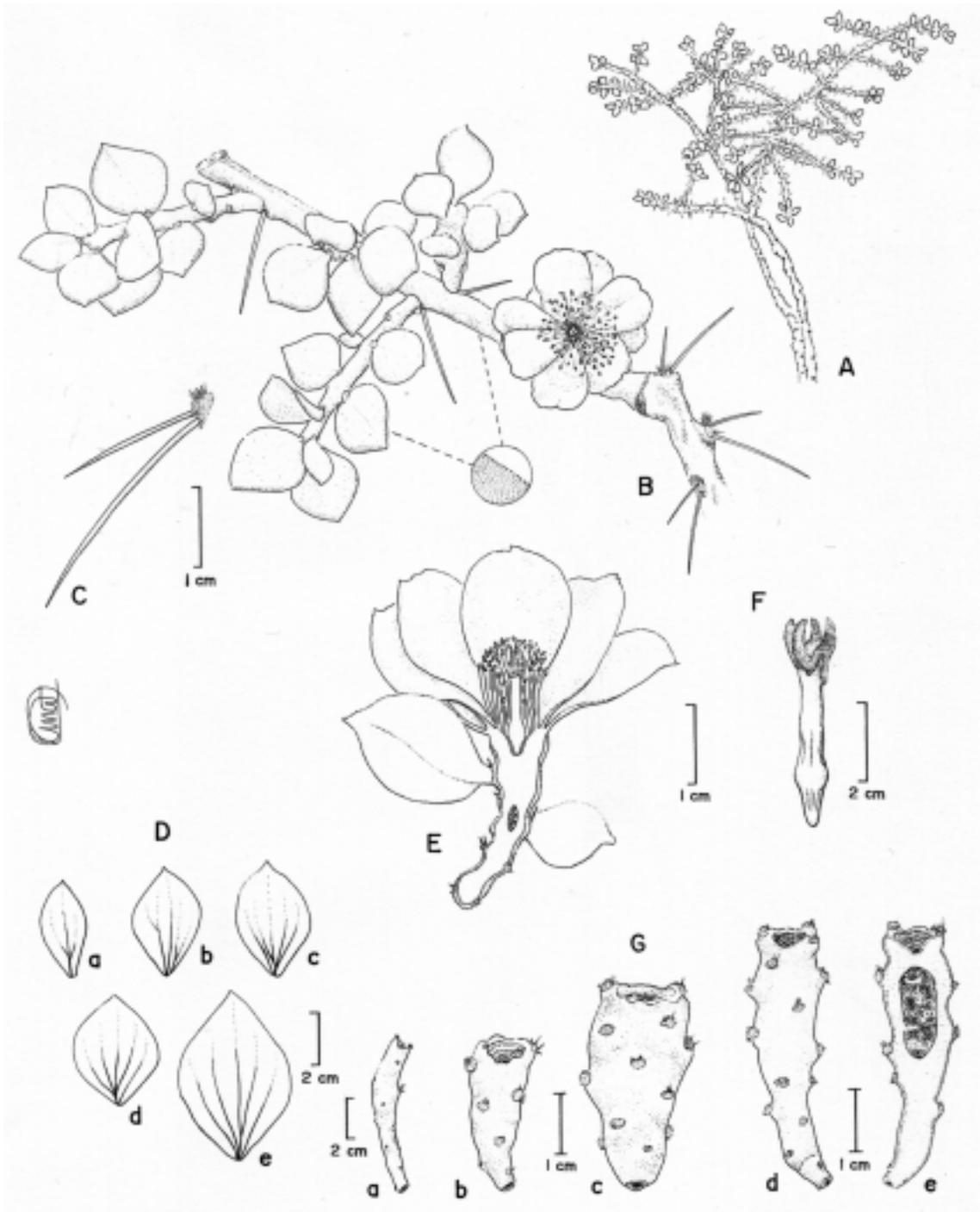


Figure 5. Botanical description of *Pereskia diguetii*. A. adult plant, shubby; B. branch with flower; C. branch spines; D. leaves; E. longitudinal cross-section of flower; F. pistil; G. fruit, external and internal view (illustration: Anabel Duarte).

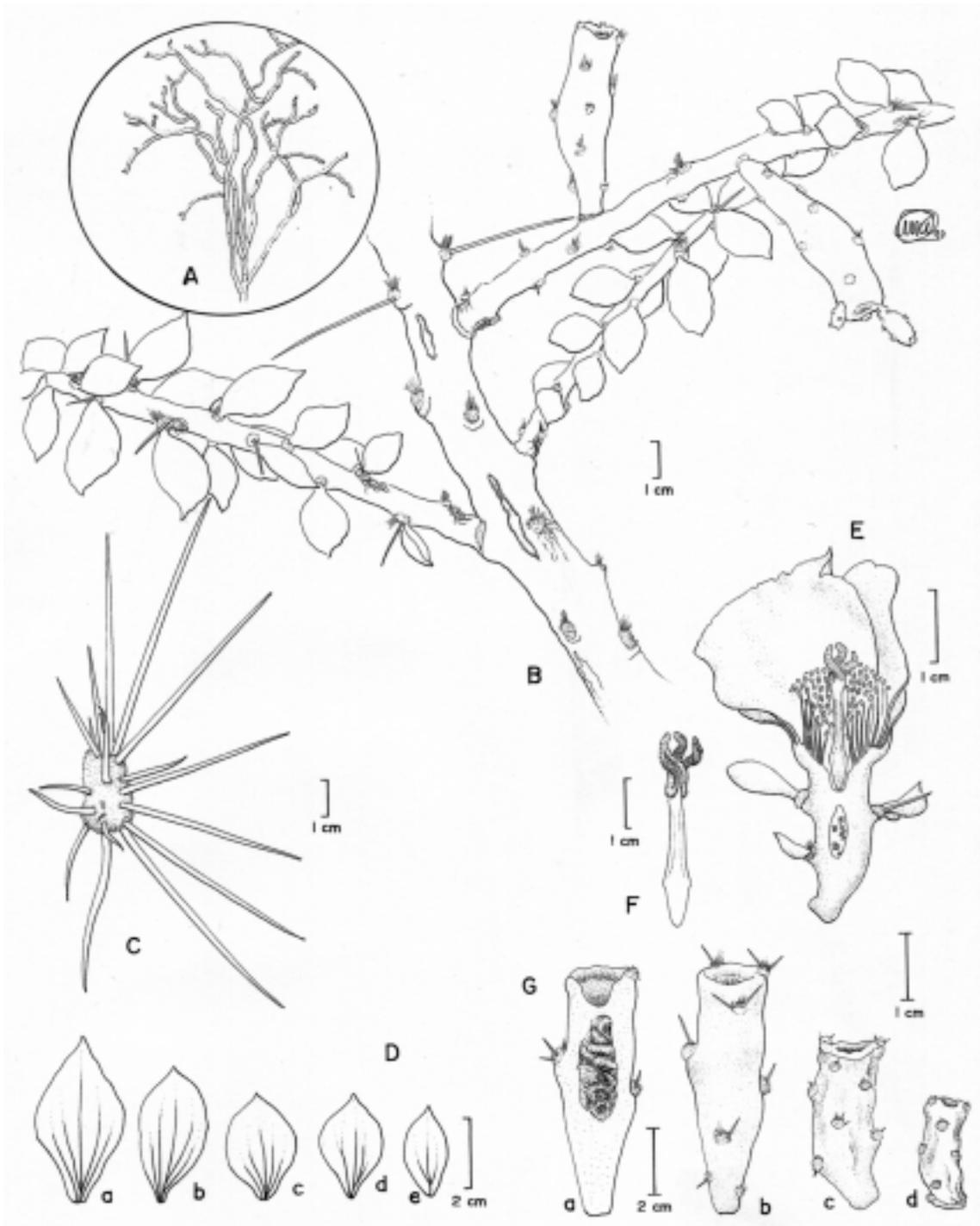


Figure 6. Botanical description of *Pereskia kellermanii*. A. adult plant, shrubby, scandent, without leaves; B. branch with fruit; C. trunk spines; D. leaves; E. longitudinal cross-section of flower; F. style; G. fruit, external and internal view (illustration: Anabel Duarte).