

Natural Habitats of Cacti and Other Succulents in Mexico[©]

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INTRODUCTION

As a Kew Diploma in Horticulture student I had the opportunity to travel to Mexico to research the natural habitats and growing conditions of cacti and succulents and to study the genus *Pinguicula*, widely represented in this country.

Mexico covers about 2 million km², bordered by the U.S.A. in the north and by Guatemala and Belize in the southeast. There are five general geographical regions: Baja California and the Buried Ranges of northwest Mexico; the central plateau and the bordering Sierra Madre; the Gulf Coast plain and Yucatan Peninsula; the trans-Mexican volcanic belt; and the highlands of south Mexico.

The climate varies from arid and semi-arid to humid and semi-humid under the influence of trade winds and cyclones and a wide range of elevations from sea level to 5,700 m. Summer is in theory the rainy season, but the precipitation varies notably from place to place. For example, in parts of Baja California the annual average is less than 500 mm with no wet season, while in parts of Chiapas the annual rainfall is more than 5,500 mm with no dry season. The range of most frequently recorded temperature varies between 10–28 °C. The lowest known value (-6 °C) is at the summit of Pico de Orizoba (5,700 m) in Veracruz. The average maximum temperatures recorded (28–30 °C) are in the low-lying regions of the Balsas Depressions and adjacent Pacific coastal zones. Most of Mexico is under the influence of trade winds bringing moisture from the east and the north (Heywood et al., 1997).

Such diversity in geography and climate makes the flora of Mexico unique, with high numbers of vascular plants and more than 15,000 endemic species.

CACTI AND SUCCULENTS

To research the natural habitats and growing conditions of cacti and succulents I visited two places.

The Universidad Nacional Autonoma de Mexico Botanic Garden at the Biology Institute in the Universidad Nacional Autonoma de Mexico. It is part of the natural reserve of Pedregal de San Andres with 176 ha and 2320 m above sea level. Since its origin in 1959 it has been dedicated to maintaining a representative collection of Mexican plants showing the biodiversity of the country. It is the oldest and the most important botanic garden in Mexico.

The living collection is divided into arid zone (the biggest section), temperate zone (mainly conifers), medicinal plants (traditional Mexican medicinal plants), and a tropical zone (in a glasshouse).

Tehuacan-Cuicatlan Biosphere Reserve. Situated approximately 150 km southeast of Mexico City, the landscape varies from pine-oak forest in the southern Sierra Madre to xerophytic scrublands with outstanding columnar cacti. The average annual precipitation in the valley ranges from 250 mm–500 mm, falling from May through to October, with the majority between June and September <www.

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pakswatch.org>. Plants seen here included *Pachycereus weberi*, *P. grandis*, *Escontria chiotilla*, *Neobuxbaumia mezcalaensis*, *Acacia pringlei*, many different *Agave* species, and prominent populations of *Echinocactus platyacanthus*, *Cephalocereus columna-trajani*, *Neobuxbaumia macrocephala*, *Yucca periculosa*, and *Nolina gracilis* (syn. *Beaucarnea gracilis*). I was particularly pleased to find some individuals of the endemics *Fouquieria ochoteranae* and *F. formosa*.

MEXICAN PINGUICULAS

Many of the Mexican pinguiculas are endemic and restricted to small localities. Illegal extractions, due to a high interest among plant collectors outside of the country, are affecting the conservation of some fragile populations.

To research the natural habitats and growing conditions of the Mexican pinguiculas I visited the following places.

The Francisco Javier Clavijero Botanic Garden. This is part of the A.C. Ecology Institute opened in 1977, and it is mainly dedicated to the study and protection of the flora of Mexico, especially the flora of Xalapa. It covers an area of 8 ha in a disturbed cloud forest. It includes formal gardens with Mexican species of high horticultural interest (e.g., *Zinnia elegans*, *Tagetes erecta*, *Euphorbia pulcherrima*, and *Lantana camara*) and tree collections as well as examples of local natural habitats such as cloud forest and Acahual, a typical disturbed vegetation common in Xalapa, predominantly covered with *Piper auritum*. It also holds the Mexican national cycad collection.

Cofre del Perote Natural Park. An hour's drive from the Botanic Garden, this has Mexico's highest peak, 4,250 m above sea level. In the area called El Volcanillo, on a southwest facing slope about 2,350–2,500 m above sea level, grows *P. moranensis*, amongst a disturbed forest of *Pinus pseudostrobus*, *Alnus* sp., *Buddleja* sp. and *Arbutus xalapensis*. The soil is very damp and similar to peat in color and texture.

Ecology Institute in Patzcuaro, Michuacan. Here I met the director, Dr Sergio Zamudio, a world-reputed *Pinguicula* specialist.

Cerro Blanco, Patzcuaro. *Pinguicula oblongiloba* growing in a disturbed pine and cedar forest.

Villa Juarez, San Luis Potosi. On the north side of the 'Cerro del Puente', 1,200–1,400 m above sea level, this is the only area in the country where *P. gypsicola* can be found. It grows on gypsum soil in a dry environments in association with *Agave striata*, *Hechtia* sp., *Dasyllirion longissimum*, and *Selaginella* sp. These associated plants tend to create micro-habitats, trapping useable moisture.

Sierra El Cubo, San Diego de la Union. Here the vegetation is oak forest dominated by *Quercus mexicana* and *Q. cocolifer*, *Ipomoea stans*, *Rhus aromatica* (syn. *R. trilobata*), and *Aristolochia* sp. and *Pinguicula ehlersiae* among the rocks.

LITERATURE CITED

Heywood, V.H., S.D. Davis, O. Herrera-MacBryde, J. Villa-Lobos, and A.C. Hamilton. 1997. Centres of plant diversity. A guide and strategy for their conservation. Vol. 3: The Americas, The World Wide Fund For Nature and IUCN-The World Conservation Union, Oxford, U.K.

A full report of the study is available to Mary Helliard Travel Scholarship sponsors.