

confusion a garden plant of unknown origin was named *P. corrugata*, but a study of the type specimen clearly shows it to be identical with *P. bleo*. Some remarks on further species occurring in northern South America and the West Indies are given.



Cacti in the Argentine vegetation

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From the vegetation point of view, continental Argentina is divided into 13 phytogeographic provinces distributed into five dominiums.

The first two provinces – Yungas and Paranense – correspond to the Amazonic Dominium, and both are tropical forests. Some views of each are presented and characteristic or showy species are shown. Cacti are scant, mainly they are epiphytes such as *Rhipsalis* and *Epiphyllum*, but there are a few terrestrials like *Notocactus* and *Rebutia*.

The Chaqueño Dominium is the more extensive one; it is divided into five provinces: Chaqueña, Espinal, Prepuna, del Monte and Pampeana. After showing the physiognomy of each, some of the more characteristic cacti – abundant in the first four – are shown.

The Chaqueña Province is characterized by the presence of “quebrachos” (“quebracho blanco”, *Schinopsis* spp., Anacardiaceae, and “quebracho rojo”, *Aspidosperma*, Apocynaceae). It is principally composed of tall xerophytic trees, and cacti are abundant, especially those belonging to the genera *Opuntia*, *Cereus*, *Stetsonia* and *Cleistocactus*.

The del Monte Province is characterized by the presence of *Larrea* spp., *Prosopis* and *Acacia* being abundant. *Opuntia*, *Tephrocactus*, *Pterocactus*, *Gymnocalycium*, *Cleistocactus* and *Trichocereus* are well represented. The similarity of this zone to the microphyllous scrub – or matorral – of Mexico is amazing.

In the Espinal Province *Prosopis* is predominant forming small low woods, but there are also prairies. The cacti living here belong to the same genera as those found in the del Monte Province.

The Prepuna Province is characterized by the presence of the big candelabriform cacti, *Trichocereus*, called “cardones”. Other cacti found here include *Lobivia*, *Parodia*, *Rebutia*, *Cleistocactus*, *Blossfeldia*, etc, and mat-forming *Tephrocactus*. *Echeveria peruviana* grows here too.

The Pampean Province is principally formed by grass savannas. In some mountain ranges of this region it is possible to find *Notocactus*, *Wigginsia* and *Opuntia*. *Rhipsalis lumbricoides* grows here as an epiphyte in the woods by the rivers.

The Andean-Patagonic Dominium comprises three provinces: Altoandina, Puneña and Patagonia.

The Altoandina – high Andean- comprises the high mountains over 3,500 m altitude (gradually decreasing in height to about 500 m in Tierra del Fuego). There are no cacti in this province except mats of *Tephrocactus* and, in its lower limit, *Lobivia* (*Soehrensia*).

The Punean Province – Puneña – extends over the high plateaux between 2,500 and 3,500 m altitude, there are a few cacti such as *Opuntia* (ayrampo), *Tephrocactus* in mats, *Parodia*, *Lobivia* and a few others.

The Patagonic Province is characterized by the presence of *Mullinum* (Umbelliferae) and is made up mainly of shrubby steppes where semi-constant winds blow. About 20 species of cacti are found there belonging to the genera *Austrocactus*, *Maihueunia*, *Pterocactus*, *Gymnocalycium* and *Wigginsia*.

The Subantarctic Dominion comprises but one province, the Subantarctic Province. Its vegetation is related to that of Australia and New Zealand by the presence, among others, of *Nothofagus* (Fagaceae), *Mizodendron* (Mizodendraceae) and *Araucaria* (Araucariaceae). It is made of evergreen and deciduous cold climate forests. No cacti grow there.

References to the dominant climate and orography of each province are given and maps of different areas shown.

Anatomic Study of the Epidermis of 6 Species of *Opuntia* from the Valley of Mexico in relation to some Ecological Conditions

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Opuntia comprises plants with great adaptive capacities and the survival mechanisms that they have developed are notable, especially those related to water collection and storage. The epidermis undergoes morphological and physiological changes not totally evaluated. We decided to study the variation of the epidermis in relation to six different characters of one species in seven localities and also among seven species. We arrived at the following conclusions:

1. Types of stomata. Within the studied material the type of stomata is not a distinctive taxonomic character.

2. Size of the stomata. The length of stomata is one of the less variable characters. The observed values vary within a definite range; there is always a more frequent value for each species.

3. Depression of the stomata. We conclude that the habitational factors are decisive in determining the degree of depression. We observed that as aridity increases the stomata are less sunken.

4. Thickness of the cuticle. Our observations showed that under more arid conditions the thickness of the cuticle decreases. We corroborated the observations of Sudzuki and Moreshet on the cuticular resistance to the loss of water that prove that the thickness of the cuticle is inversely proportional to the relative humidity of the air. We believe that both habitational and genetic factors determine the thickness of the cuticle.

5. Diameter of crystals. We observed that this character is directly related to the soil's salinity and the degree of aridity of the habitat.

6. Thickness of the hypodermis. This is a specific characteristic determined by genetic factors in response to the action of habitational factors, allowing greater or lesser water storage. It is significant that each species presented different thickness values as well as different extreme superior values.

Cacti of a Bolivian woodland

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The talk centres around a trip made in December 1978 in the company of Señor Roberto Vasquez into the woodland regions of the Bolivian Andes to the south of Comarapa. The trip was made at the beginning of the rainy season in the Eastern Bolivian Andes, an area that can receive up to 5 metres of precipitate annually. Cacti of a terrestrial nature predominate, but there is evidence of some epiphytic species also; in addition to the cacti, some of the other associated flora is depicted.