Cactus Garden: A Review

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Abstract: **- A cactus garden is a garden for the cultivation and display with many types cacti. A cactus (plural: cacti, cactuses, or cactus) is a member of the plant family Cactaceae within the order Caryophyllales. The word "cactus" derives, through Latin, from the Ancient Greek κάκτος, kaktos, a name originally used by Theophrastus for a spiny plant whose identity is not certain. Cacti occur in a wide range of shapes and sizes. Most cacti live in habitats subject to at least some drought. Many live in extremely dry environments, even being found in the Atacama Desert, one of the driest places on earth. Cacti show many adaptations to conserve water. Almost all cacti are succulents. Unlike many other succulents, the stem is the only part of most cacti where this vital process takes place. Cactus stems store water. Most species of cacti have lost true leaves, retaining only spines, which are highly modified leaves. As well as defending against herbivores, spines help prevent water loss by reducing air flow close to the cactus and providing some shade. In the absence of leaves, enlarged stems carry out photosynthesis. Cacti are native to the Americas, ranging from Patagonia in the south to parts of western Canada in the north—except for Rhipsalis baccifera, which also grows in Africa and Sri Lanka.**

Keywords— Cactus

I. INTRODUCTION

They have persistent leaves, and when older, bark-covered stems. Their areoles identify them as cacti, and in spite of their appearance, they, too, have many adaptations for water conservation. *Pereskia* is considered close to the ancestral species from which all cacti evolved. In tropical regions, other cacti grow as forest climbers and epiphytes (plants that grow on trees). Their stems are typically flattened, almost leaf-like in appearance, with fewer or even no spines, such as the well-known Christmas cactus or Thanksgiving cactus (in the genus *Schlumbergera*).

This plant family is concentrated in the Americas and has a surprisingly broad latitude range in both the Northern and Southern Hemispheres.

A considerable number of cacti species are threatened, chiefly due to habitat loss to agriculture, trampling by illegal human immigration into the southwestern USA, large-scale desert solar power projects, as well as overcollecting.C acti have a variety of uses: many species are used as ornamental plants, others are grown for fodder or forage, and others for food (particularly their fruit).

II. MORPHOLOGY OF CACTUS

There are several features which are found on all members of the family Cactaceae. All cacti have a succulent stem, inferior ovary, and unique structures called areoles. Areoles are a unique feature found in a wide number of positions on the cacti and are composed of two perpendicular buds. From the upper bud come the flowers and fruit or new branches, and from the lower bud come the spines. For the genus Opuntia, the areoles have groups of minute barbed bristles or glochids that can be very painful indeed - they become detached at the slightest tough to penetrate the skin - ouch!

The flowers of cacti are generally solitary. The flowers are quite beautiful, appearing in shades of red, yellow, orange, and pink. There is no clear distinction between the sepals and petals in the perianth, but a gradual transition from sepals to petals. In addition, the ovary can bear areoles, scales, spines, or hairs for protection of the flowers and fruit.

Evolution has caused the stems of many cacti to become thickened, resulting in an optimal spherical or cylindrical shape which minimizes water loss by providing a high ratio of volume to surface area. This also protects the plant against excessive sunlight. The stem surface manifests a waxy coating that aids in water retention; however, stems and spines can absorb moisture, which process is vital for species that receive most of their water intake via fog.

Cacti have numerous stamens with long filaments. Interestingly, some genera such as Opuntia have sensitive stamens: when touched by an insect or even a finger, they close over the top of the pistil and straighten again a moment later. This makes for an effective and efficient pollination strategy!

III. SURVIVAL STRATEGIES

Cacti have many unique adaptations to their environment that enable them to survive in harsh conditions. These plants live in dry areas, so keeping enough water on hand and protecting this supply of water are big priorities! Plants lose water primarily through stomates on the leaf and stem surfaces.

Cacti cannot afford to lose water during the hot daytime temperatures, so their stomates open at night! This allows the plants to take up CO2 at night when it is cool. At sunrise, as the temperature rises, the stomates close to prevent water loss and the stored CO2 is used for

photosynthesis. This process is called Crassulacean acid metabolism, or CAM for short. Their stomates are also normally sunken such that they are not flush with the stem. This allows the stomates to remain protected from the heat as well.

As previously mentioned, cacti have unique features called areoles that produce spines and glochids. These sharp structures help protect the plant from animals that would surely like to eat the cactus for its abundant water content! In some cases, these spines are light-colored and reflect as much as three-fourths of the sunlight striking them. This helps keep the plant cool in the hot desert sun. The spines can also act as insulation on cold winter nights, raising the tissue temperatures above those that can damage cells.

IV. CULTIVATION

The popularity of cacti means many books are devoted to their cultivation. Cacti naturally occur in a wide range of habitats and are then grown in many countries with different climates, so precisely replicating the conditions in which a species normally grows is usually not practical. A broad distinction can be made between semidesert cacti and epiphytic cacti, which need different conditions and are best grown separately. This section is primarily concerned with the cultivation of semidesert cacti in containers and under protection, such as in a greenhouse or in the home, rather than cultivation outside in the ground in those climates that permit it.

V. PESTS AND DISEASES

A range of pests attack cacti in cultivation. Those that feed on sap include: mealybugs, living on both stems and roots; scale insects, generally only found on stems; whiteflies, which are said to be an "infrequent" pest of cacti;red spider mites, which are very small but can occur in large numbers, constructing a fine web around themselves and badly marking the cactus via their sap sucking, even if they do not kill it; and thrips, which particularly attack flowers. Some of these pests are resistant to many insecticides, although there are biological controls available. Roots of cacti can be eaten by the larvae of sciarid flies and fungus gnats. Slugs and snails also eat cacti.

VI. TAXONOMY AND CLASSIFICATION

The difficulties continued, partly because giving plants scientific names relies on "type specimens". Ultimately, if botanists want to know whether a particular plant is an example of, say, Mammillaria mammillaris, they should be able to compare it with the type specimen to which this name is permanently attached. Type specimens are normally prepared by compression and drying, after which they are stored in herbaria to act as definitive references. However, cacti are very difficult to preserve in this way; they have evolved to resist drying and their bodies do not easily compress. A further difficulty is that many cacti were given names by growers and horticulturalists rather than botanists; as a result, the provisions of the International Code of Nomenclature for algae, fungi, and plants (which governs the names of cacti, as well as other plants) were often ignored. Curt Backeberg, in particular, is said to have named or renamed 1,200 species without one of his names ever being attached to a specimen, which, according to David Hunt, ensured he "left a trail of nomenclatural chaos that will probably vex cactus taxonomists for centuries.

Tribe Cacteae

- *Acharagma* N.P.Taylor & Glass
- *Ariocarpus* Scheidw.
- *Astrophytum* Lem.
- *Aztekium* Boed
- *Coryphantha* Engelm Lem.
- *Echinocactus* Link & Otto
- *Echinomastus* Britton & Rose
- *Epithelantha* F.A.C.Weber ex Britton & Rose
- *Escobaria* Britton & Rose
- *Ferocactus* Britton & Rose
- *Geohintonia* Glass & W.A.Fitz Maur
- *Leuchtenbergia* Hook.
- *Lophophora* J.M.Coult
- *Mammillaria* Haw
- *Mammilloydia* Buxb.
- *Neolloydia* Britton & Rose
- *Obregonia* Fric

Tribe Opuntieae

- *Brasiliopuntia* (K.Schum.) A.Berger
- *Consolea* Lem
- *Miqueliopuntia* Fric ex F.Ritter
- *Opuntia* Mill.
- *Tacinga* Britton & Rose
- *Tunilla* D.R.Hunt]] & [Iliff]

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