

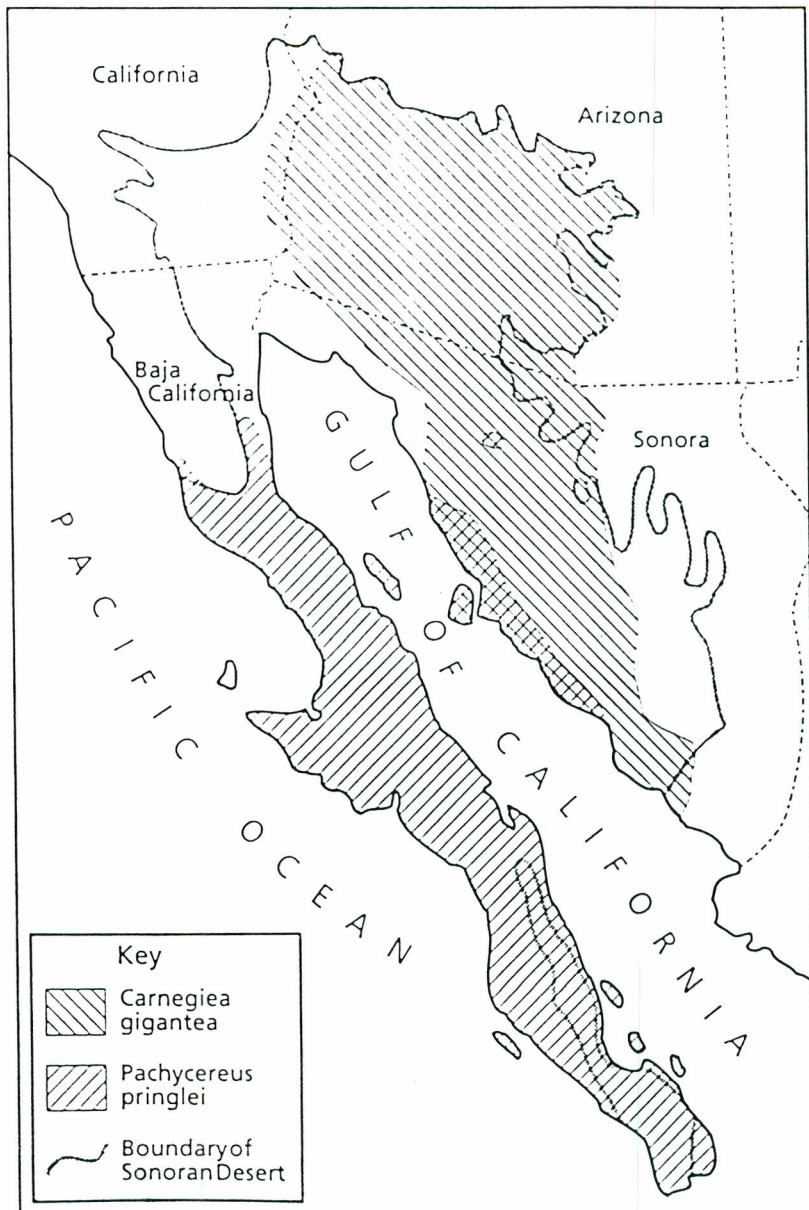
Giants of the Sonoran Desert

With space at a premium in just about every cactus collection it is easy to forget about the larger-growing species of cacti which so dominate the landscapes in which they naturally grow. Roger Labbett reminds us of the attractions of two of the world's largest cacti which, between them, grow across most of the Sonoran Desert.



The distribution of *Carnegiea gigantea* and *Pachycereus pringlei*

The Sonoran Desert is situated in the south-west corner of the US and in the north-west corner of Mexico. It comprises the south-western corner of Arizona, a small area in the extreme south-east of California, much of the Mexican state of Sonora and a major part of the peninsula of Baja California.



Characteristic of the region are two species of giant cacti. Although their distribution only overlaps along the eastern coast of the Gulf of California, between them they cover virtually the whole of the 120,000 square miles that go to make up the Sonoran Desert. Nowhere do they grow more than a few miles outside its boundaries.

Carnegiea gigantea

Ask the average layman to describe his favourite cactus and he will almost inevitably start talking about large plants with arms that he has seen in cowboy films. This is that plant. It grows almost exclusively in Sonora and south-western Arizona, with just a few specimens venturing across the border into California. Contrary to the belief of many it does not grow wild in Texas, which is in fact around 200 miles from the nearest habitat.

Many will know this plant better by its common name 'saguaro', pronounced 'suh-war-oh'. This name is a Spanish corruption of the name given it by the native Americans who lived in the desert and valued its fruit as a source of food and drink.

Mature plants typically grow to 10 to 12 metres tall, although some individuals have been reliably recorded up to 18m, with other less substantiated claims of up to 24m having also been made. These large specimens are estimated to be 150 to 200 years old based on known growth rates.

Despite their height, the stems of mature plants are relatively slender — 15 to 20cm diameter at the base, swelling to around 30 to 40cm half way up the plant. Mature plants branch at about 3 to 5m from the base, typically with five or six main branches. Very old plants may have more main branches, with some secondary branching also taking place. The largest specimens are variously recorded or estimated as weighing 6 to 9 tonnes.

Pachycereus pringlei

This species is less well known, but certainly no less spectacular. It grows throughout the desert areas of Baja California, in Sonora along a coastal strip about 50km wide, and also in an isolated colony about 100km from the coast near Pitiquito. The Mexicans call this plant 'cardon', a name it shares with a few other species of large Mexican cacti.

Like the *Carnegiea*, mature plants are typically 10 to 12m tall, but specimens over 20m have been recorded by a number of reliable sources. Not only is it probably ultimately slightly taller than its eastern brethren, it is also more massively proportioned. The main trunk can grow to around 1.5m in diameter and flairs out as it enters the ground. It is this 'elephant's foot' feature that is the source of the plant's generic name — meaning 'thick cereus'. Mature plants are many branched, usually from about 1.2m above the ground, and large specimens have been estimated to weigh over 10 tonnes.

Structure

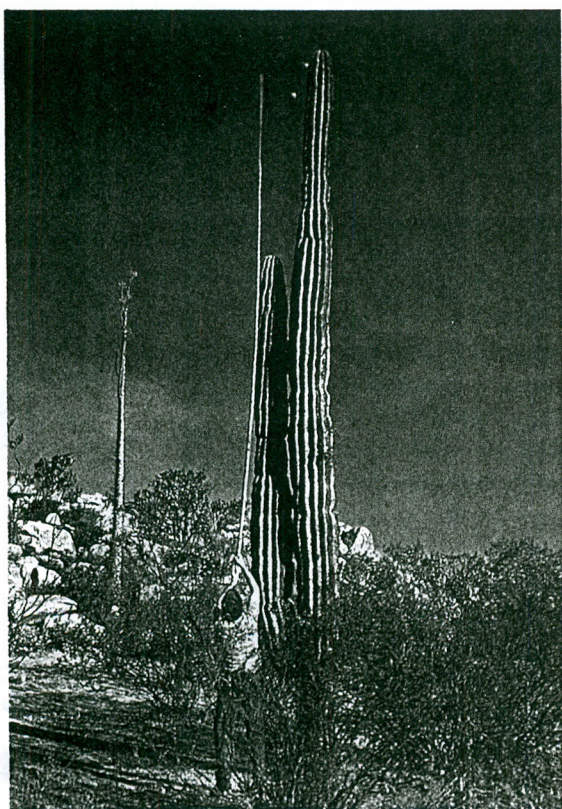
Both species have a light but strong wooden

(Right)

The author using a rib from one of its fallen brethren to remove a fruit from the top of a *Pachycereus*. This is essentially the same method used by generations of natives to harvest the fruit of both featured plants for food.

(Opposite)

A fine specimen of *Pachycereus pringlei* growing near Mission San Fernando, Baja California



lect the seeds in large numbers, remove the embryo, and store the remainder for later consumption. Even in the more favourable growing areas it has been estimated that only one in 1,000 seeds actually survives the 2 to 4 weeks between the fruit ripening and the arrival of summer rains, and achieves germination. Even then, its problems are only just beginning.

Too much heat, too much cold or too much water can all rapidly cause the demise of a seedling during its first few months of life. The ideal location for a young seedling seems to be in coarse, gravelly soil, under the shade of a bush or tree, on a sloping hillside. In the northern part of the *Carnegiea* distribution, south facing hillsides provide the best habitats due to the warmer winter conditions. Even if they germinate in a suitable position, the young plants have little to defend themselves from a selection of burrowing insect larvae and small rodents to which they represent a convenient package of moisture and food. Given all this it is not surprising that it is estimated that only one in 100 plants that germinate survive longer than about 6 weeks.

Pachycereus seed and seedlings no doubt run the gauntlet of similar problems, although their habitats are more remote and they have not been the subject of as much scientific study. In the areas in which they grow in the south-west corner of the Sonoran Desert, regular annual rainfall cannot be guaranteed and it seems unlikely that one year's seeds would survive to lie dormant awaiting more favourable conditions.

Initial growth rates in both species are relatively slow given their eventual size. In the wild, a *Carnegiea* seedling 2cm high is likely to be around 10 years old. Depending on the amount of moisture available, a plant a metre high may be anything from 20 to 50 years old.

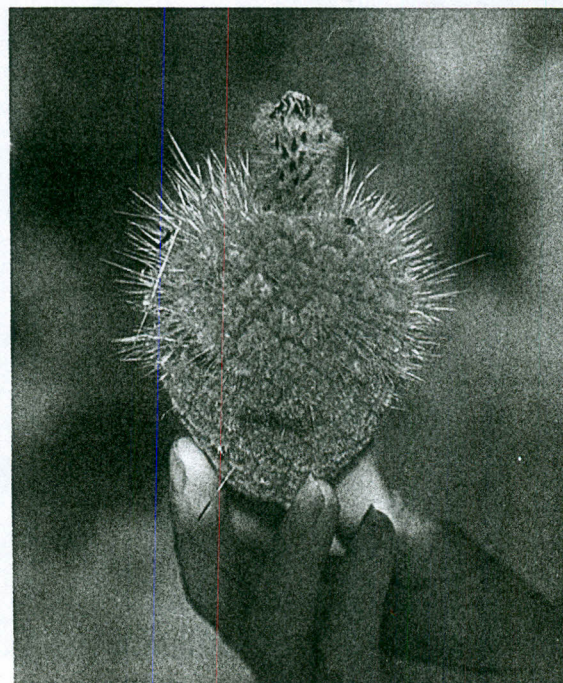
Growth then speeds up until the plant reaches flowering size. *Pachycereus* seedlings grow at around 2cm per year, but on vigorous mature plants, rates up to 30cm per year have been reported. Although seedlings of both species grow more quickly in cultivation, there is still a disparity in growth rates. In 10 years of UK cultural conditions, most growers should be able to achieve a 50-60cm high *Pachycereus*, but a *Carnegiea* sown at the same time is likely to be only around 10cm high.

Survival

Coming as it does from the more northerly and populous areas of the desert, *Carnegiea gigantea* has probably suffered more than the *Pachycereus* at the hand of man. Apart from the obvious effects of flattening a forest of saguaros to build a housing development or a shopping mall, they have also suffered from more gradual destructive forces. In the latter part of the 19th and the early 20th century, areas of desert were used as open cattle range. The cows ate the small shrubs that provided nursery cover for young seedlings, and trampled or kicked over the young cactus themselves. The cattlemen and numerous mineral prospectors also cut down the small trees and shrubs to provide firewood. All this resulted in a break in the natural succession of the forests which only became evident in the middle of the 20th century as old saguaros died and there were no young ones to replace them.

In recent years we have also had the well-publicised activity of the 'cactus rustlers' who have uprooted specimen plants from the desert in order to sell them to individuals who wish to have the status symbol of a saguaro in their front garden. Although the authorities are actively clamping down on this illegal activity it is difficult to see how they can effectively police the large areas of desert involved, and some rustling must still go on.

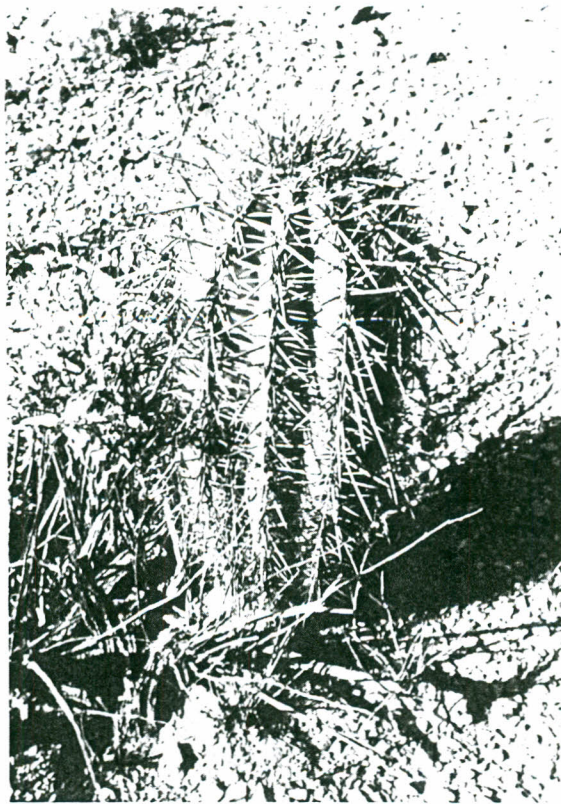
Areas in the north and east of the distribution have the greatest rainfall and therefore tend to



(Right)

A fruit of *Pachycereus pringlei* showing its felty outer skin with a few needle-like spines

Although only about 15cm high, this juvenile *Carnegiea*, growing in the Saguaro National Monument West, is probably approaching 20 years of age

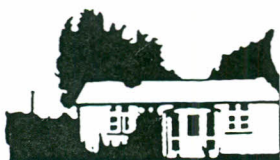


As it is likely to take around 20 years for a plant to reach this size, and the plant may still be in only a 15cm pot, it cannot be regarded as a waste of precious greenhouse space.

As mentioned previously, the *Pachycereus* is rather quicker in growth, although not excessively so. It also has more attractive spination and nice blue-grey skin colouring. It will make a really magnificent plant a metre or so high in about 15-20 years from seed. To be grown to perfection it will probably benefit from being bedded out, although 30-40cm pots will accommodate plants up to about 1.5m high provided that feeding and watering are attended to regularly. Young plants are small in diameter at soil level and then swell out considerably up to around 25cm above ground. This makes them a bit top heavy, so it is best to grow pot plants in a spot where they will not need to be moved about. This top heaviness, along with the sharp needle like spines of young specimens, means that repotting any plant over about 30cm tall requires a bit of planning and the assistance of someone who will not panic at the first prick of a cactus spine.

References:

- Hodge, Carle. (1991). *All About Saguaros*. Arizona Department of Transportation.
- Roberts, Norman C. (1989). *Baja California Plant Field Guide*. Natural History Publishing Company.
- Shreve, Forrest and Wiggins, Ira L. (1964). *Vegetation and Flora of the Sonoran Desert*. Stanford University Press.



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