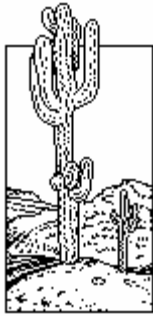




Saguaro

Adapting to the Desert



No plant quite like it grows anywhere else in the world. The saguaro (*Carnegiea gigantea*), the tree-like cactus towering over the slopes at Tonto National Monument, makes its home only in the Sonoran Desert.

Saguaros were flourishing when the Salado lived here, from AD 1150 to 1450. Because they are long-lived, saguaros now in the monument may be great-grandchildren of those the Salado saw.

The Salado used saguaros in various ways. They built roofs with its wood-like ribs. They ate the fruit or made a number of products, just as today's desert dwellers do. They also may have used the syrup and cakes made of dried fruit pulp as trade items.

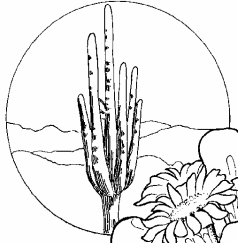
Scientists say the landscape is much the same today as it was during the 300 years the Salado lived in this region, although there were more grasses and trees then, and a river ran through the valley now filled in by Roosevelt Lake.

Sharing a common habitat, saguaros and Salado adapted to this desert environment in similar ways. They both collected water from great distances. The Salado brought water from the river and from springs in the canyons to their cliff dwellings. Saguaros soak up water up through extended root systems and store it in their cylindrical trunks.

Both saguaros and Salado developed specialized systems for processing food from desert elements. The saguaros take advantage of the temperature extremes to help convert sun and moisture into sugar. The Salado processed nutritious foods from the wild plants they gathered in the desert.

Overpopulation might have pressured them into stripping the desert. An exhausted food supply would have left them vulnerable to internal strife, disease, and famine.

Yet an obvious difference exists between the adaptation methods of saguaros and the Salado; the plant was successful, the people were not. Saguaros have existed in the Sonoran Desert for 10,000 years. Despite the advantages of human intelligence and mobility, the Salado disappeared. Archeologists speculate that the Salado depleted their environment.



**Saguaros can live
two hundred years**

Saguaros owe their continued existence to fine-tuned adjustments to desert conditions.

Only one or two of the millions of seeds a saguaro produces during its lifetime will germinate. The seeds must land on well-drained, rocky soil, preferably on south-facing slopes under “nurse plants” that provide crucial shade.

Those seeds not eaten by birds or packrats sprout after the summer rains, when temperatures range between 60 and 95° F. Saguaros grow very slowly. They might grow three feet tall in 14 years, and take 20 years to double that. Between 60 and 75 years, they begin to sprout arms. Saguaros can reach heights of 50 feet and weigh several tons.

When they are about 50 years old, saguaros start to flower, producing about 200 blossoms annually. The white blossoms, perched on the tops of columns and branches, open at night. The flowers, which remain open for less than 24 hours, are pollinated by moths and bats.

The saguaro’s skin is coated with a wax-like substance that prevents water loss through evaporation. In addition, thousands of needle-like spines create shade and help break up wind currents. Downward pointing spines act like rain gutters, guiding moisture to the roots. Because of their waxy coating, saguaros cannot photosynthesize in the usual way. They open their pores at night, letting in air. The cold desert nights facilitate the conversion of carbon dioxide into an acid, which the cactus stores and turns into food the next day under the hot desert sun.

Saguaros soak up water through shallow root systems, which radiate from the trunk to a distance roughly equal to the plant’s height. Pleated ridges running the length of the trunk act like accordions, expanding and contracting in response to the water supply. Pulpy tissues and the supporting skeleton help with water distribution.

The Sonoran Desert has been experiencing colder temperatures since the turn of the century. Scientists are studying the saguaro’s reaction to this climate change.

Research has shown that cold temperatures have occurred intermittently for several thousand years. These temperatures may be cold enough to stunt or kill many desert plants.

Preliminary studies at Tonto show a high proportion of young saguaros, indicating a healthy population and creating optimism for their future.