

Bacterial Necrosis of Saguaro Cacti

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Bacterial necrosis is prevalent throughout the natural saguaro population. While uncommonly seen in small plants, these also are susceptible.

Cause

The disease is caused by a bacterium, a soft-rotting member of the *erwiniae*. The same organism has been recovered from rotting cholla, prickly pear, barrel, and organ pipe cacti. It has been isolated from naturally infected plants from Texas and Mexico, in addition to Arizona.

Symptoms

The symptoms may appear at one or more positions on the trunk or branches of saguaros at any time. The first external indicators of bacterial necrosis are usually a circular darkening and softening of the plant tissues. In time, the infected area typically enlarges, becoming purplish-black, and splits open. If such an opening occurs, a dark odorous substance will frequently "leak" from the plant. At other times, the soft areas dry and crack, revealing the dark, dry remains of diseased tissues. If conditions are favorable, the plant can confine the disease to a "pocket" by forming a barrier of protective tissue (callus) around the affected area. If the tissue does not rapidly form or if it is breached in some way, the

infection will spread. There is no way to predict how long a plant might survive following the occurrence of such symptoms.

Disease Cycle

The bacterium occurs in the diseased plant tissue of living cacti, and in the exudates associated with the infected areas. It also may be found in fallen, decaying saguaros and in adjacent soil. Infection begins when the pathogen is introduced into the cactus through wounds or natural openings. Presumably, insects and small animals, which are associated with diseased or decaying saguaros, serve as the principle carrier. Of these, the night-flying moth *Cactobrosis fernaldialis* appears to be an important vector. The larvae of this moth are commonly found feeding in the base of saguaro flower buds. They also tunnel into the plant providing an open wound. It is along these tunnels that infections may take place.

Control

Removal of the diseased tissue is the most practical way of attempting to control the spread of the infection within the plant. The sooner this is done after the symptoms are noted, the better the chance of limiting the rotting. Unfortunately, the only way to tell how far the disease has progressed within the plant, beneath the external symptoms, is to dig into the infected area. If the affected area is small, one should remove all the rotting material including up to one-half inch of the surrounding healthy tissue. Slope the bottom of the excavation so that water will drain out. The walls of the clean rot pocket should be smooth. In removing the rotting material, be careful not to make "puncture-type cuts into the remaining healthy tissue since the pathogen

can survive in such sites. Thoroughly wash the cleansed pocket with 10% household bleach solution (e.g., 1 part Clorox and 9 parts of water; also include one teaspoon of liquid detergent per gallon of solution) and then allow the pocket to stand open to hasten healing.

If the lesion is located such the described treatment is not practical or if it is so large to nearly girdle or weaken an arm or plant, serious consideration should be given to removal of the affected structure. Otherwise, damage might result should the branch or plant unexpectedly fall.

A Broader Perspective

While the landowner is justifiably saddened by the loss of a giant saguaro, it may be of some consolation to view the rot as a natural part of the desert environment. The active rot pocket is a wet spot in a dry place, and there is a raft of desert dwellers, including insects, fungi, nematodes, and others, that depend on it for moisture and nutrients. In addition, calloused-over dry-rot pockets in surviving saguaros can offer places of respite for larger animals. However, much still remains to be learned about the role of soft-rot of saguaros and other cacti in our Southwestern desert ecosystem.

