

# Pinyon Twig Beetles

Often overlooked but important branch and tree killer

**Name and Description**—*Pityophthorus* spp. [Coleoptera: Curculionidae: Scolytinae]

A number of different bark beetles will attack the branches and twigs of pinyon pine trees, but it is the members of the genus *Pityophthorus* that are most commonly referred to as pinyon twig beetles (fig.1). Despite their small size, these scolytids behave in a manner similar to larger bark beetles that attack the boles and large branches of host trees.



Figure 1. *Pityophthorus* sp. Photo: E. Richard Hoebeke, Cornell University, Bugwood.org.

*Pityophthorus* is the largest genus of bark beetles in North America with over 120 different species. The very small size of these insects (less than 1/10 inch [1.5-2 mm] long), combined with the large degree of diversity within the genus caused the authors of ref. 50 to advise their readers that “Identification is for experts and students of taxonomy.” However, the similarity of behavior within this group allows the practitioner to treat these beetles as if they were all the same.

**Host**—Pinyon

**Life Cycle**—Twig beetles become active in the early spring, and, depending on local temperature regimes, this can be as early as mid-March. The adult beetles attack the branches at varying distances from the branch tip. If large numbers of beetles are present, they will utilize sections of the branch further away from the tips. The beetles will bore through the thin bark of the branches, creating small galleries in the phloem. Several females will mate with a single male, but the confined spaces of the branch tips result in a non-descript gallery pattern. Pheromones are used by twig beetles to coordinate attacks and recruit large numbers of beetles to specific hosts, but the exact constituents of the pheromone system are generally unknown. Attack sites are notable by the presence of tiny pitch tubes (fig. 2) in the generally pitchy branches of pinyon pine. Tiny eggs are laid within the branches that hatch quickly. Beetle larvae feed on the phloem within the branch, finally pupating within the bark. The emerging adult beetle will feed for a short time within the branch before emerging to attack new host sites. Generally, there are several generations over the course of the warmer months, but the length and number of generations are highly dependent on local weather conditions. In general, there are between two and four generations per year.



Figure 2. Pitch tubes on pinyon pine from attack by *Pityophthorus* spp. Photo: Tom Eager, USDA Forest Service.

The quick generation time of twig beetles is matched by rapid changes in the host’s appearance. As noted above, the first indication of twig beetle activity is the appearance of tiny pitch tubes at each attack site. As time passes and the beetles consume more of the host tissues, the needles of an affected branch will start to dry out and turn to a golden yellow. As feeding continues, the branch tip will die, and individual needles will start to drop off of the branches. About the time the new adult beetles are ready to leave the infested material, the affected branches will consist of a light husk of bark, with the phloem having been completely consumed and a wooden pith remaining. Tearing away the very thin bark will reveal some very fine powder (frass) that has been left behind by the feeding beetles. Though twig beetle activity is sometimes confused with the attacks of the pinyon ips (*Ips confusus*), with some practice, it is easy to distinguish the two, even from a distance. Trees attacked and killed by pinyon ips have numerous pitch tubes and leave boring dust on the bole of the tree. The coloration of the foliage of a tree killed by pinyon ips quickly fades from green to light brown to a distinctive reddish brown. In the case of pinyon twig

## Pinyon Twig Beetles - page 2

beetles, the fact that these beetles typically do not attack portions of the tree with thick bark means that only the smaller twigs and branches will be affected, leaving a portion of the foliage unaffected. The distal tips of the branches will be attacked, and the crown of the tree will have a frosted appearance with the overall color being more yellow to tan rather than red (fig. 3). Final diagnosis can be determined by examining the branch tips for the previously mentioned signs of beetle activity. During epidemics, all of the branches on a tree may be attacked, ultimately killing the entire tree.

**Damage**—In general, pinyon twig beetles do not cause much of a problem in pinyon stands, but they can achieve pest status under certain conditions. During periods of drought, their numbers can become large as they are quick to take advantage of drought-stricken hosts. The close relationship between moisture availability and the host tree's ability to produce pitch means that the ability of pinyon trees to defend themselves declines under drought conditions. Twig beetles can also cause problems in the wake of human activity. Cutting, pruning, or disrupting the root system of pinyon trees can weaken them to the point that they become more susceptible to the twig beetle. In addition, the volatile odors that are created by host wounding can attract and concentrate twig beetles that then attack and damage the residual trees.

**Management**—Management techniques that maintain pinyon trees and stands in a healthy condition are probably the best defense against twig beetles. Proper techniques should be exercised if tree cutting or disturbances are unavoidable within a pinyon stand. These techniques include limiting disturbance to the colder months of the year when the beetles are inactive, removing slash that would otherwise attract beetles, and monitoring affected stands for signs of beetle attack for a period following such activities. Supplemental watering during drought periods helps the trees avoid stress. However, if beetle numbers appear to be increasing in a general area, this additional care may not be enough to prevent attack. In such cases, preventive sprays may be used to protect individual trees. Such sprays are also suitable for protecting against pinyon ips.



Figure 3. Pinyon tree under attack by twig beetles. Note the "frosted" appearance, with outer twigs affected and inner branches still green. Photo: Tom Eager, USDA Forest Service.

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1. Furniss, R.L.; Carolin, V.M. 1977. Western forest insects. Misc. Publ. 1339. Washington, DC: U.S. Department of Agriculture, Forest Service. 654 p.