

Pinyon Ips

Causes death of mature pinyon pines

Name and Description—*Ips confusus* (LeConte) [Coleoptera: Curculionidae: Scolytinae]

The pinyon ips (fig. 1) is a small, brown, cylindrical bark beetle with spines on the distal portion of the abdomen, which is typical for this genus of bark beetles. Pinyon ips has five such spines. The adult's length ranges between 1/8 and 1/4 inch (3 and 6 mm).

Host—The pinyon ips is recognized as a primary cause of mortality for mature pinyon pines. Within Colorado, it attacks two-leaf pinyon (*Pinus edulis*), but other pinyon pine species serve as hosts to this insect in other areas.

Life Cycle—Adult beetles attack potential hosts in the warmer months of the year, typically from March until the end of October. There are two and one-half to three generations per year, although overlapping broods are quite common. The adult male initiates attacks in the bole and larger branches of the host and constructs a central nuptial chamber. Males release pheromones that attract two to four responding females who then mate with the male and construct individual egg galleries radiating away from the central nuptial chamber. The resulting gallery pattern frequently appears to have a Y shape to it (fig. 2). The females lay numerous eggs in the galleries, and the resulting larvae feed beneath the bark until they are ready to pupate. The mature larvae create individual pupal chambers, from which they emerge through the bark to seek out new hosts. During the winter months, large numbers of adult beetles seek overwintering sites in the lower boles of host trees. While no brood is produced from these “feeding galleries,” (fig. 3) large numbers of overwintering beetles can effectively girdle and kill the host tree.

Damage—Trees that have been attacked are fairly conspicuous. The initial phases of attack are notable for the large amounts of resin or “pitch” that readily flow from the attack site. This pitch flow constitutes a major component of the host tree's defense system, and the phenomenon of mass attack that is driven by pheromone release serves to attract enough beetles to exhaust this defense. Periods of low moisture availability mean that less resin is produced by the tree, thus decreasing the tree's defenses.

Like other bark beetles, pinyon ips can operate in either an endemic or epidemic fashion. Most of the time, populations of this insect are sparse, and the insects persist in pinyon stands by attacking damaged or stressed host trees. Mechanical damage, fire injury, drought, and stress created by other damaging agents (particularly black stain root disease) often increase host tree susceptibility. Human activity that results in tree damage to any portion of the trees, including roots and branches, can create habitat suitable for the beetles. In addition to the stress created by damage to host trees, mechanical wounding of trees releases volatile compounds found in tree resin that are particularly attractive to *Ips* spp. beetles. Small outbreaks of the beetle are often initiated by thinning, road or structural construction, or other similar activities.



Figure 1. Pinyon ips adult (*Ips confusus*). Photo: William M. Ciesla, Forest Health Management International.

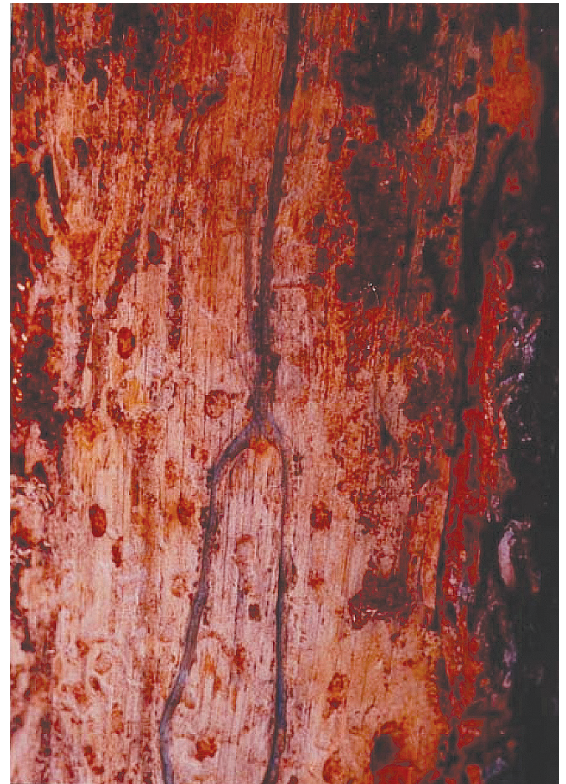


Figure 2. Typical Y-shaped gallery of pinyon ips. Photo: Tom Eager, USDA Forest Service.

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Figure 3. Overwintering or "feeding galleries" of pinyon ips. Photo: Tom Eager, USDA Forest Service.

When large numbers of suitably stressed host trees become available, pinyon ips populations can increase rapidly and kill large numbers of pinyon trees. During periods of outbreak conditions, beetle populations can increase in susceptible stands and then spread to adjacent, unsusceptible stands, killing large numbers of host trees. Vast acreages of pinyon trees can be affected at times; a noteworthy outbreak from 2002 to 2004 killed millions of pinyon pines over an area that included portions of six southwestern states.

Management—Over the long run, the most economical and efficient means of protection is maintenance of pinyon trees and stands in as thrifty a condition as possible. Reduced stocking and sanitation of damaged or diseased trees will reduce the chance that pinyon ips can build up

in susceptible hosts and then emerge to attack additional trees. High-value trees in landscaping and recreational settings can be protected by using a chemical protective spray. Care must be taken to ensure complete coverage of the tree, as insufficient treatments will result in the death of the tree. During periods of drought, supplemental watering may also provide a degree of protection to stressed trees.

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