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Ips grandicollis larva.

Eastern five-spined bark beetle

The eastern five-spined bark beetle, *Ips grandicollis* (Eichhoff) (Curculionidae: Scolytinae), is a destructive, wood-boring pest of pine trees (*Pinus* spp.). It is not present in New Zealand.



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Ips grandicollis adult.

The eastern five-spined bark beetle (sometimes called the eastern five-spined engraver, or southern pine engraver) threatens New Zealand's forestry industry. It primarily attacks recently killed pine trees (including *P. radiata*), though living trees may also be attacked, even those that appear healthy. Adults bore chambers under the bark of host trees. They emit pheromones to attract more beetles, eventually overwhelming the defences of living hosts. Adults and developing larvae feed on the phloem.

This bark beetle is native to North and Central America. It has been introduced to China and most notably, Australia, where it is widespread and common after being discovered in the 1940s. Economic losses attributable to this species in North America and Australia are measured in the tens of millions of dollars each year.

Symptoms to look for

- An accumulation of red boring dust in bark crevices and at the base of the tree.
- Needles above attack sites on live hosts begin to turn red as the attack progresses.
- Entire crown turning red and then brown as the host dies. Host survival is unlikely if successfully attacked by this species.
- Numerous emergence holes can be seen in older infested wood.

Though the damage caused by this species is typical of many bark beetle species, live pine trees are rarely attacked by bark beetles in New Zealand. Reddened needles and accumulations of boring dust on live pine trees could be indicative of the eastern five-spined bark beetle.

Hosts

The primary hosts for this beetle are pine trees (*Pinus* spp.), including *Pinus radiata*. It has also been recorded from larch (*Larix* spp.).

Beetle life cycle

In the spring, overwintering adult males initiate nuptial galleries by burrowing through the bark and into the phloem. The pheromone ipsenol is released to attract

both mates and more males, whose combined attacks overcome the defences of the host tree, if it is alive. Mated females excavate egg chambers in which they lay up to 50 eggs. Larvae bore their own radiating galleries where they feed on the phloem. They pupate within the tree. The production of one generation takes 2-3 months. One generation is produced each year in cooler areas, with reproduction being continuous in warmer parts of their range. Adult beetles remain in their natal hosts for a few weeks after pupation, feeding on phloem tissue. Larvae, pupae, and adults may overwinter in host trees. Adults may also overwinter in leaf litter. The adults are highly mobile and may fly several kilometres in search of host trees.

Identification and testing

Adult beetles are reddish brown and 3-4.5 mm in length. They can most reliably be identified by comparison to specimens in well-curated collections, by skilled individuals. The identification of larvae requires either rearing to adulthood or the use of molecular sequencing techniques.

As required by the Biosecurity Act (1993), if you encounter any insects or tree damage which you suspect could be Eastern five-spined bark beetle, call the Biosecurity New Zealand Pest and Disease hotline – 0800 80 99 66. The Ministry for Primary Industries will coordinate how best to proceed with sampling and identification.



Typical *Ips* engraving damage.

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