

European spruce bark beetle *Ips typographus*

The European spruce bark beetle is a destructive pest of spruce, having caused extensive economic loss and ecosystem disruption in Europe. If introduced into Michigan, this insect may pose serious threats to spruce forest ecosystems, landscape trees and ornamental tree industries.

[Michigan risk maps for exotic plant pests.](#)

Systematic position

Insecta > Coleoptera > Curculionidae > Scolytinae > *Ips typographus* (Linnaeus)

Global distribution

Europe, Northern Asia (China, Japan, Korea, Russia), and Asia Minor.

Quarantine status

This insect has not been documented in the United States. However, it has been intercepted at U.S. ports of entry 286 times between 1985 and 2000 (Haack 2001) and is considered an exotic organism of high invasive risk to the United States (USDA-APHIS 2008).

Plant hosts

Spruce (*Picea*) is the primary host. Occasional hosts include fir (*Abies*), larch (*Larix*), pine (*Pinus*) and Douglas-fir (*Pseudotsuga menziesii*).

Biology

The male beetle bores into a host tree bark constructing a nuptial chamber in which he mates with a few females. Each female bores her own egg gallery out from the nuptial chamber. After egg hatch, larvae bore their way through the phloem and pupate at the ends of their tunnels. Adults emerge through holes they excavate through the bark. The beetles go through one to two generations yearly and overwinter as adults in litter or under bark. Males produce pheromones that attract both sexes to the host tree. When boring through the host tree, beetles transmit blue-stain fungi on sapwood, disrupting the flow of lethal resin into the beetle galleries. The beetles usually prefer weakened or damaged trees, but during outbreaks they mass-attack and kill healthy trees.

Identification

- **Adult:** 4.0-5.5 mm long; body cylindrical and dark brown; elytral declivity (backend of the front wings) equipped with 4 spines on each side.
- **Larva:** Up to 5 mm long, white, legless; C-shaped grub



Above, adult. (Photo: G. Csoka, Hungary Forest Research Institute, Bugwood.org)



Right, larva (Photo: D. Adam, Office National des Forêts, Bugwood.org)

with amber-colored head.

- **Pupa:** 15 mm long, white, mummy-like.

Species identification of bark beetles must be made from the adult stage (Inglitis 2006). Eight native *Ips* species are present in the northeastern United States (Wood 1982), and they may look similar to the European spruce bark beetle. View link for more information: <http://www.barkbeetles.org/exotic/htypgrph.html>

Signs of infestation

- Foliage of infested trees fades from green to yellow to reddish-brown.
- Reddish-brown boring dust on bark surface of trees, freshly cut logs, or windthrow.
- Pitch tubes in bark crevasses.
- Galleries in cambium consisting of a nuptial chamber and two to five longitudinal egg galleries. Galleries may be accompanied by blue-stain in woody tissue.
- Round exit holes on the bark.

Management notes

In Minnesota, Lindgren funnel traps have been used to survey for exotic bark beetles (USDA-APHIS-PPQ). The European spruce bark beetle usually breeds in weakened or recently felled trees. Control and preventative options include removal of infested trees, mass trapping with pheromone-baited traps or trap trees, and debarking of spruce logs before transporting to new areas (EPPO, Kolk and Starzyk 1996).



Pupa. (Photo: M. Jurc, University of Ljubljana, Bugwood.org)



Galleries of European spruce bark beetle under the bark of Norway spruce. (Photo: J. Liska, Forestry and Game Management Research Institute, Bugwood.org)



Cross section of Norway spruce sapwood infected by a blue-stain fungus. (Photo: L. Nageleisen, Département de la Santé des Forêts, Bugwood.org)



Saw dust piles left behind entrance holes of European spruce bark beetle (Photo: S. Kinelski, Bugwood.org)

Economic and environmental significance to Michigan

Spruce and other coniferous hosts are widely present in natural forests and are important ornamental trees in Michigan. The European spruce bark beetle, if introduced into Michigan, may cause severe economic and environmental damage. Economic damage may include a reduced commercial value of infested wood products, loss of markets due to quarantine requirements and tree mortality (Eglitis 2006). In addition, beetle outbreaks may lead to extensive ecological disruption resulting from the change of tree species composition to non-host trees, increased fuel loading for wildfires, deforestation of riparian communities and loss of biodiversity. Regulatory actions against the exotic beetles may also become costly and long-term since newly established beetle populations may remain unnoticed for many years due to their concealed activity and slow development of damage symptoms (Eglitis 2006).

Likely pathways of entry in Michigan

Imports associated with solid wood products and packing material (lumber, crating, pallets, and dunnage).

If you find something suspicious on a susceptible host plant, please contact MSU Diagnostic Services (517-355-4536), your county extension office, or the Michigan Department of Agriculture (1-800-292-3939).

References

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