

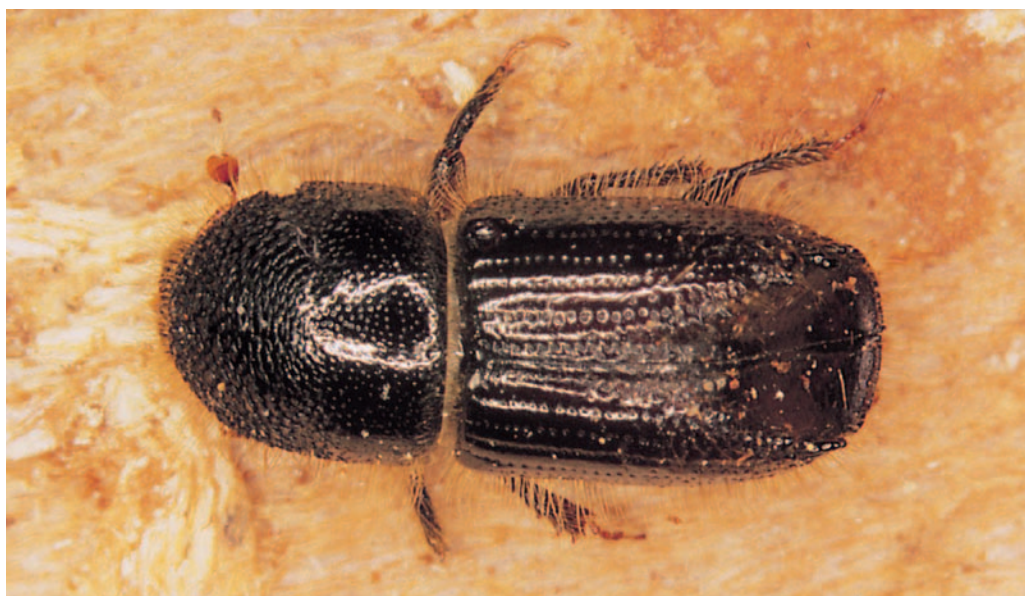
Ips typographus

Other scientific names: *Dermestes typographus* Linnaeus, 1758; *Bostrichus octodentatus* Paykull, 1800; *Ips japonicus* Nijima, 1909; *Ips sexdentatus* Börner, 1776; *Tomicus typographus* Linnaeus, 1758

Order and Family: Coleoptera: Scolytidae

Common names: European spruce bark beetle; spruce beetle; spruce engraver beetle; eight-toothed spruce bark beetle

Ips typographus Linnaeus, 1758 is one of the most serious and destructive pests of spruce in its native range of Asia and Europe. It is common throughout the entire natural range of *Picea abies* in Europe and also occurs in plantations in Western Europe, outside the natural range of the host. Outbreaks have occurred in the Czech Republic, Germany, Italy, Norway, Poland, Slovakia and Sweden. This pest has caused excessive secondary damage in forests already damaged by other factors such as severe storms. *I. typographus* is a significant quarantine pest risk in North America where it has been intercepted at several locations.



Adult European spruce bark beetle, *Ips typographus*

DISTRIBUTION

Native: Europe; Asia and the Pacific (northern)

Introduced: No records to date

IDENTIFICATION

Larvae are small, legless and whitish in colour with orange heads and the pupae are waxy white and approximately 4 mm long (Humphreys and Allen, 1999).

Adult beetles are cylindrical, reddish, dark brown or black in colour and approximately 4.2 to 5.5 mm long (EPPO/CABI, 1997; Kimoto and Duthie-Holt, 2006).

Long yellowish hairs cover the front of the head and the sides of the body. Both sexes have four spines on each side of the posterior portion of the forewings, with the third spine being the largest and enlarged at the tip (Kimoto and Duthie-Holt, 2006).

HOSTS

Picea spp., including *P. abies* (main host in Europe), *P. orientalis* and *P. yezoensis* (northern Asia); *Pinus* spp.; *Abies* spp.

BIOLOGY

The European spruce bark beetle attacks both stressed and healthy trees in groups and overwhelms the defence mechanisms of host trees. During non-outbreak periods, the beetles breed in wind-felled trees, slash and logs while during outbreaks the beetles kill healthy trees (EPPO/CABI, 1997). Attacks are initiated by the males, who construct nuptial chambers under the bark, emit aggregation pheromones and are subsequently joined by 1 to 4 females (Kimoto and Duthie-Holt, 2006). The females construct egg galleries in the inner bark where they lay approximately 50 eggs on each side. Young larvae feed in larval galleries which radiate at right angles to the egg gallery and become wider as the larvae grow. Pupation takes place at the ends of the larval galleries. Young adult beetles mature and feed under the bark creating characteristic tunnels in the wood before emerging through round exit holes approximately 2 to 3 mm in diameter (Humphreys and Allen, 1999). The beetles generally overwinter in the adult stage, mainly in the forest litter near the tree where they developed but also under the bark of the host tree.

The number of generations per year and the timing of the life cycle depend on climate. At high altitude and latitude only one annual generation is produced while in the lowlands of Central Europe two generations are typical and even three generations per year at warmer sites (EPPO/CABI, 1997). Spring flight occurs when the air temperature rises to approximately 20 °C which generally occurs from April to June in different parts of its range. The flight for the second generation generally takes place in July or August but in northern areas, adults emerge from July to October and in central Europe emergence of the second generation may take place as late as November (EPPO/CABI, 1997).

SYMPTOMS AND DAMAGE

The needles of attacked conifers turn yellow-green to reddish-brown and eventually drop within a few weeks. Other signs of infestation include red-brown frass in bark crevices, the presence of round exit holes, and small pitch tubes extruding from the bark (Kimoto and Duthie-Holt, 2006). Woodpecker damage may also be evident.

As with other conifer bark beetle species, *Ips typographus* is a vector for blue-stain fungi (*Ophiostoma* spp., *Ceratocystis polonica*) which hastens the death of trees, discolours the wood and can result in loss of timber grade and value.



Extensive gallery systems, blue-stained wood and round exit holes indicate attack by *Ips typographus*

DISPERSAL AND INTRODUCTION PATHWAYS

Adult *Ips* beetles are capable of flying up to 4 km in search of suitable host material and they are also subject to wind dispersal. Transport of unprocessed logs, wood products or wooden packing materials, dunnage or pallets containing bark strips can provide a means of introduction of immature stages and adults.

CONTROL MEASURES

The most effective control measure against damage by *Ips typographus* is to remove infested trees and all potential breeding materials such as weakened trees, windthrows and logs with bark before the new generation of adult beetles emerge. Silvicultural techniques aimed at increasing the stability and vitality of forest stands is also recommended. The use of pheromone-baited traps or trap trees has also been successfully used to trap and suppress beetle populations and prevent outbreak conditions.

As this pest is of major quarantine importance, debarking of logs before export is the best and likely only efficient way to prevent it from being introduced into new areas.



G. ALLARD

Pheromone traps have been used to help control Ips typographus in Slovakia