CAPS Datasheets provide pest-specific information to support planning and completing early detection surveys.

# *Ips typographus* (Linnaeus, 1758)

## Scientific Name

*Ips typographus* (Linnaeus, 1758)

**Synonym(s):**
*Dermestes typographus* Linnaeus, 1758
*Tomicus typographus* (Linnaeus, 1758)
*Bostrichus octodentatus* Paykull, 1800
*Ips japonicus* Niisima, 1909


**Figure 1.** *Ips typographus* adult (Source: Pest and Diseases Image Library, Bugwood.org, CC BY-NC-SA 3.0.)

## Common Name

**European spruce bark beetle**
Eurasian spruce bark beetle
eight-dentate bark beetle
eight-spined engraver
eight-toothed spruce bark beetle
spruce bark beetle

## Type of Pest

Bark beetle

## Taxonomic Position

**Class:** Insecta, **Order:** Coleoptera, **Family:** Curculionidae

## Pest Recognition

*This section describes characteristics of the organism and symptoms that will help surveyors recognize possible infestations/infections in the field, select survey sites, and collect symptomatic material. For morphological descriptions, see the Identification/Diagnostic resources on the AMPS pest page on the CAPS Resource and Collaboration website.*

### Pest Description

Adults: The bark beetle *Ips typographus* is $^{1}/_{6}$ -$^{1}/_{5}$ in. long and approximately 2.5 times longer than wide (Fig. 1). Adults are black or brownish black (Douglas et al., 2019; Grüne, 1979; Kolk and Starzyk, 1996). They have a characteristic pill-shaped body with a smooth, sloping, and concave posterior (also known as an elytral declivity) (Fig. 2a and b). There are four spines on each lateral side and the largest spine is in the third position (Fig. 2c and d). Adults can be observed flying, under the bark, or in litter or soil around trees when overwintering (Annila, 1969; Botterweg, 1982).

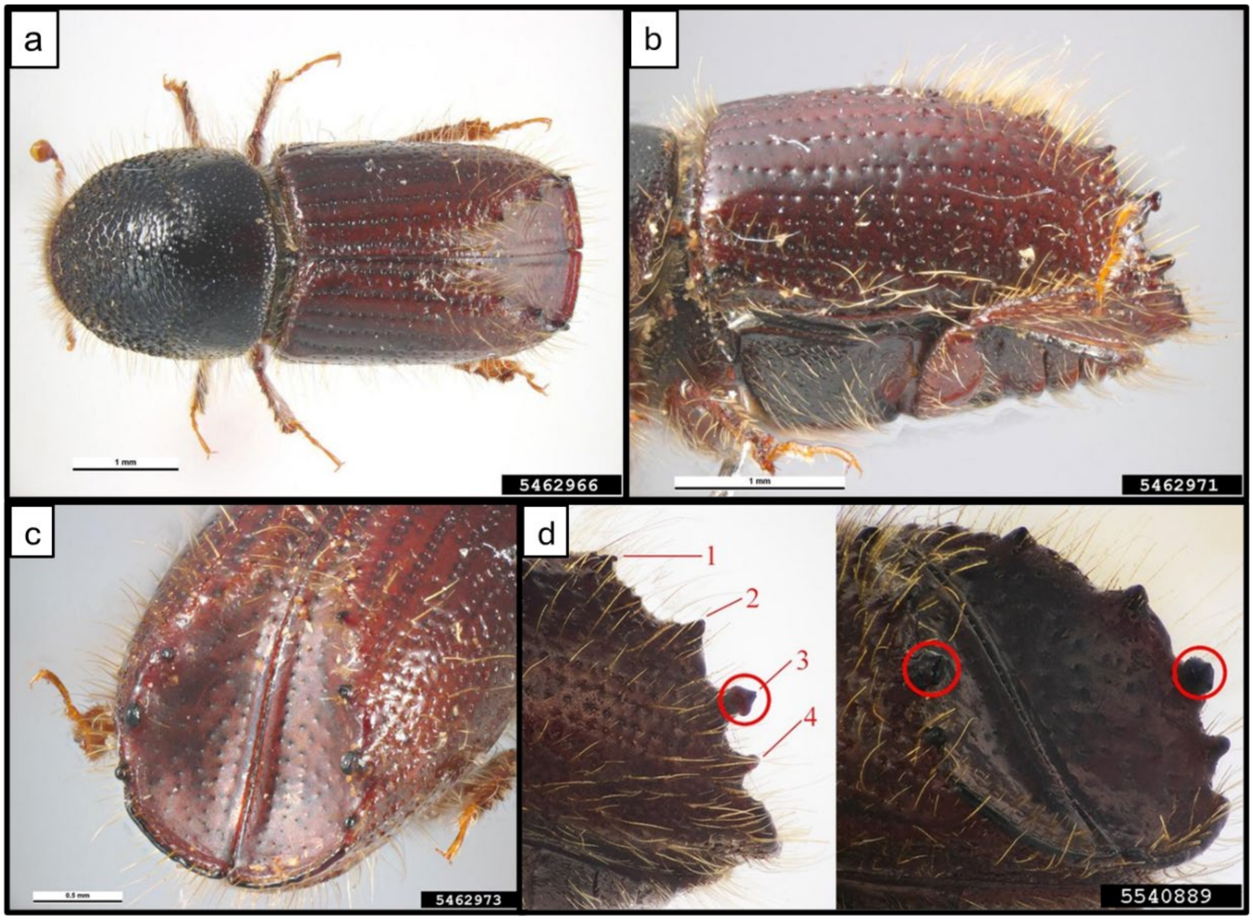


**Figure 2.** *Ips typographus* adult: **(a)** dorsal view, **(b)** lateral view showing the rear declivity, **(c)** dorsal view of rear declivity, and **(d)**: declivity showing the largest 3rd spine (Sources: (a, b & c) Pest and Diseases Image Library, Bugwood.org and (d) by Joseph Benzel, Screening Aids, USDA APHIS PPQ) Bugwood.org)

Eggs: Eggs are yellowish-white (Kolk and Starzyk, 1996). They can be found in the inner bark, along the galleries made by the female (Fig. 3a) (Chararas, 1962).

Larvae: Mature larvae are $^{3}/_{16}$ in. long, c-shaped grubs, and the body is white with a distinct amber head (Fig. 3b) (Eglitis, 2006; Kolk and Starzyk, 1996). They can be found in galleries in the inner bark (Chararas, 1962).

Pupae: Pupae are white and mummy-like, showing some adult features, including clearly visible wings that are folded behind the abdomen (Eglitis, 2006; Kolk and Starzyk, 1996). They are located in round chambers at the ends of larval galleries (Fig. 3c) (Chararas, 1962).

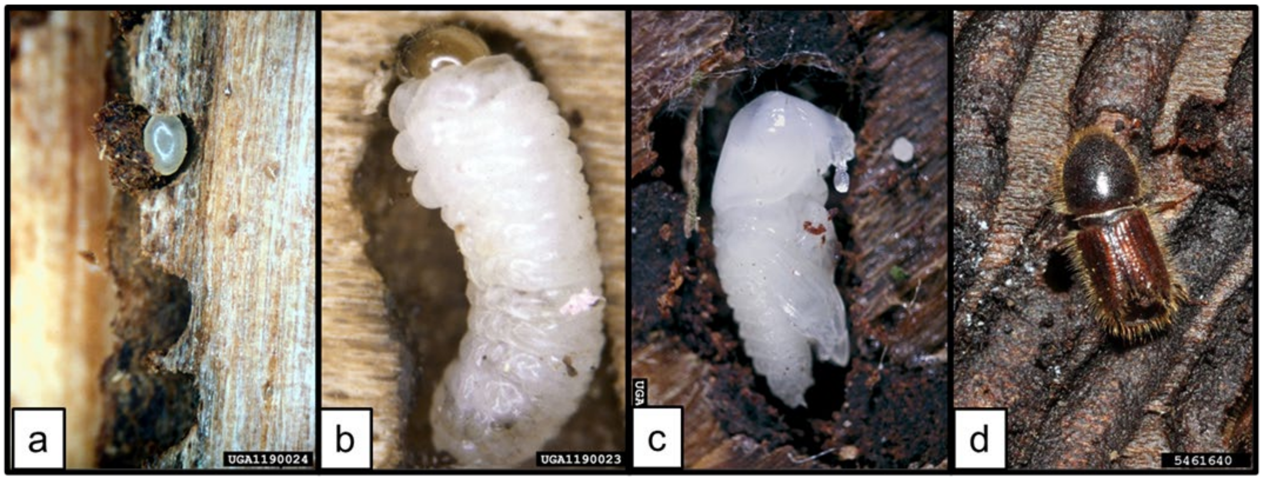


**Figure 3.** *Ips typographus* life stages: **(a)** egg, **(b)** larvae, **(c)** pupa, and **(d)** adult (Source: (a) and (b) Daniel Adam, Office National des Forêts, Bugwood.org; (c) Maja Jurc, University of Ljubljana, Bugwood.org; (d) William M. Ciesla, Forest Health Management International, Bugwood.org)

## Signs and Symptoms

Signs of *I. typographus* attack look different based on the level of infestation and early signs are often difficult to observe or diagnose. In early infestations, signs are similar to other bark beetles and primarily occur on recently felled or stressed trees, starting in the upper part of trees or thicker branches (Mezei, 2025). These include entrance holes (approximately $^{1}/_{16}$–$^{1}/_{10}$ in. in diameter), resin exudate and brownish frass in spruce bark crevices and trunks, dry dust outside entrance holes (Fig. 4a,b,d), and emergence holes (Fig. 4c) (Paynter et al., 1990; Stříbrská et al., 2023). Female, egg, and larval galleries may also be observed under the bark (Fig. 5). Brood and larval galleries occur in a species-specific pattern (Fig. 5a,b) (Chararas, 1962; Sauvard, 2004). Egg galleries branching from the main gallery are characteristic of *Ips* species and often form a Y- or X-shaped pattern (Ciesla, 2011). Multiple larval galleries of up to 3 $^{9}/_{16}$ in. will develop from there (Chararas, 1962).

If *I. typographus* reaches outbreak levels, major signs may also appear, and healthy trees will be affected. These more obvious signs may include the foliage becoming yellowish, then reddish-brown and eventually falling (Fig. 6) (Abdullah et al., 2018; Mezei, 2025) and tree death (Fig. 6a,b) (Mezei et al., 2014).

In addition, just like nearly all *Ips* species, this bark beetle is associated with ophiostomatoid fungi that cause a distinctive blue staining on the wood (Fig. 7) (Kirisits, 2004).

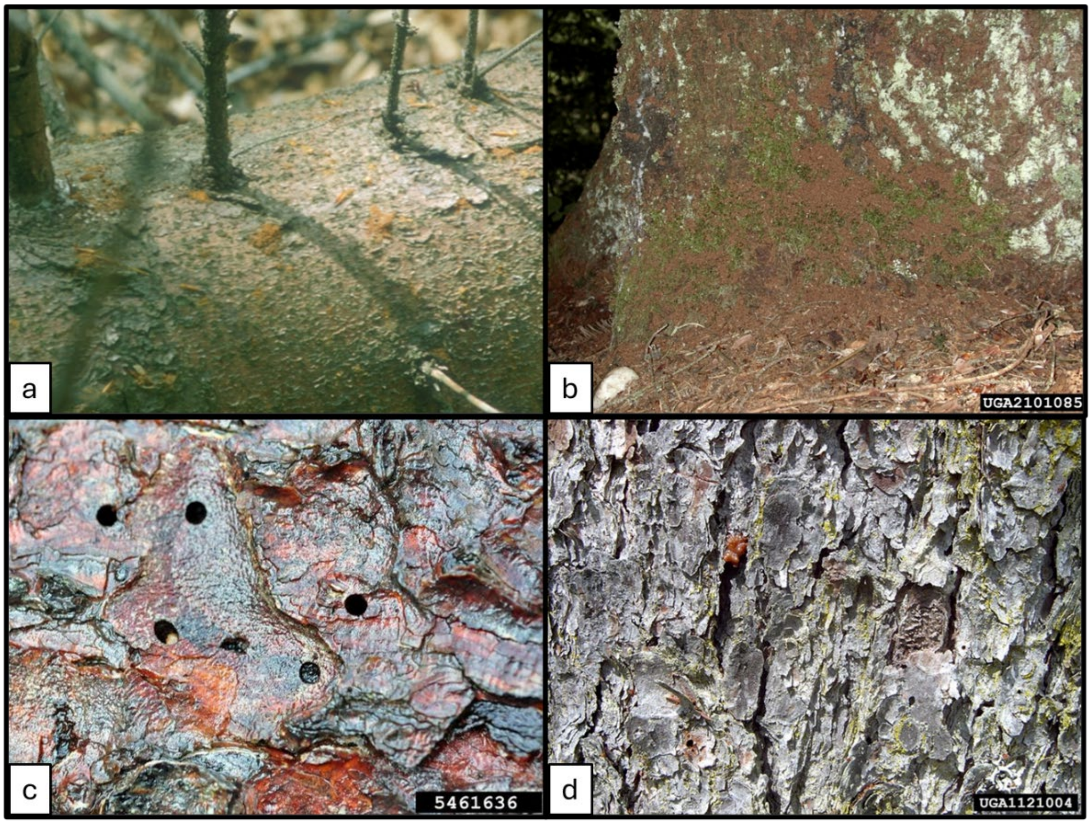


**Figure 4.** *Ips typographus* infestation signs: **(a)** dry dust near entrance holes, **(b)** saw dust, **(c)** exit holes, and **(d)** resin exudate (Sources: (a) Maja Jurc, University of Ljubljana; (b) Louis-Michel Nageleisen, Département de la Santé des Forêts; (c) William M. Ciesla, Forest Health Management International; and (d) Daniela Lupastean, University of Suceava. All images from Bugwood.org, licensed under CC BY-NC-SA 3.0)

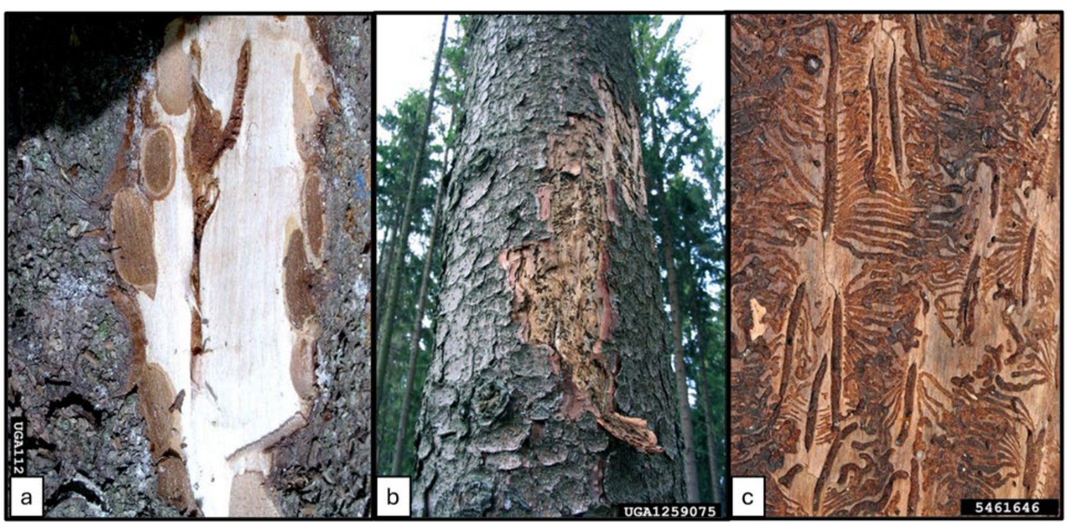


**Figure 5.** *Ips typographus* galleries: **(a)** female gallery for egg laying; **(b)** larval galleries; and **(c)** gallery patterns (Sources: (a) Daniela Lupastean, University of Suceava (b) Landesforstpräsidium Sachsen; and (c) William M. Ciesla, Forest Health Management International. All images from Bugwood.org, licensed under CC BY-NC-SA 3.0)

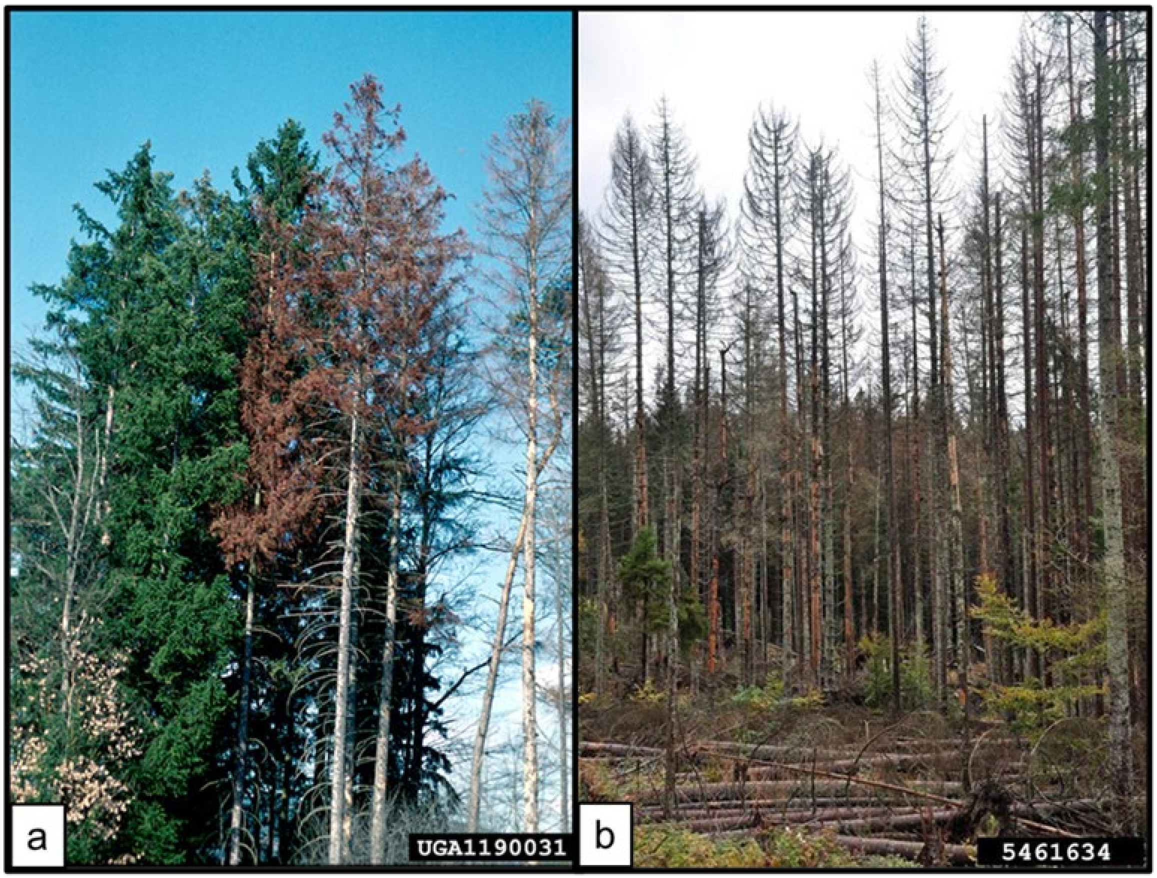


**Figure 6.** *Ips typographus* infestation symptoms: **(a)** discoloration in trees and **(b)** dead trees and logs (Sources: (a) Louis-Michel Nageleisen, Département de la Santé des Forêts; (b) William M. Ciesla, Forest Health Management International. Images from Bugwood.org, licensed under CC BY-NC-SA 3.0)


**Figure 7**. Blue stain fungi (*Ophiostoma* sp.) in sapwood (Source: Louis-Michel Nageleisen, Département de la Santé des Forêts, Bugwood.org, CC BY-NC-SA 3.0)

## Easily Mistaken Species

*Ips cembrae*, *I. nitidus*, and *I. subelongatus* (Fig. 8) can be easily mistaken for *I. typographus*, are native to Europe and Asia (Douglas et al., 2019), and are not present in the United States. Similar to *I. typographus*, all of these species use spruce (*Picea* spp.) as a host, but only *I. nitidus* uses it as a main host (Douglas et al., 2019). Interactive keys for *Ips* bark beetles of the world can be found in Douglas et al. (2019).


**Figure 8**. *Ips* species adults similar to *I. typographus* not present in the United States: **(a)** *Ips cembrae*, **(b)** *Ips nitidus*, and **(c)** *Ips subelongatus* (Sources: (a) and (c) Pest and Diseases Image Library, Bugwood.org; (b) Wang Z. Ecology and Nature Conservation Institute, Chinese Academy of Forestry, Beijing)

Several similar *Ips* species are present in the United States (Atkinson, 2024). Some of them develop on spruce (*Picea* spp.) and use spruce as the main host (Douglas et al., 2019). The most common are *I. borealis*, *I. hunteri* (blue spruce engraver), *I. perturbatus, I. pilifrons,* and *I. tridens* (Fig. 9) (Cognato, 2025; USDA-FS, 2010). *Ips typographus* can be distinguished from these species by the presence of a central tubercle on the frons (front part of head behind mouthparts) however, this character requires a microscope for identification (Douglas et al., 2019).

The distribution of the *Ips* spp. mentioned above is as follows: *I. borealis* infests *Picea* spp. in Alaska, Colorado, Maine, Michigan, Minnesota, Montana, South Dakota, and Wyoming; *I. hunteri* mainly infests *Picea pungens* (blue spruce) in Arizona, Colorado, South Dakota, Utah, and Wyoming; *I. perturbatus* mainly infests *Picea glauca* (white spruce) in Alaska, Maine, Michigan, Minnesota, Montana and Washington; *I. pilifrons* infests *Picea engelmannii* in Arizona, Colorado, Idaho, Nevada, New Mexico, Utah, and Wyoming; and *I. tridens* infests *Picea* spp. in Alaska, California, Idaho, Montana, Oregon, Washington, and Wyoming (Atkinson, 2024; Burnside et al., 2011; Douglas et al., 2019).

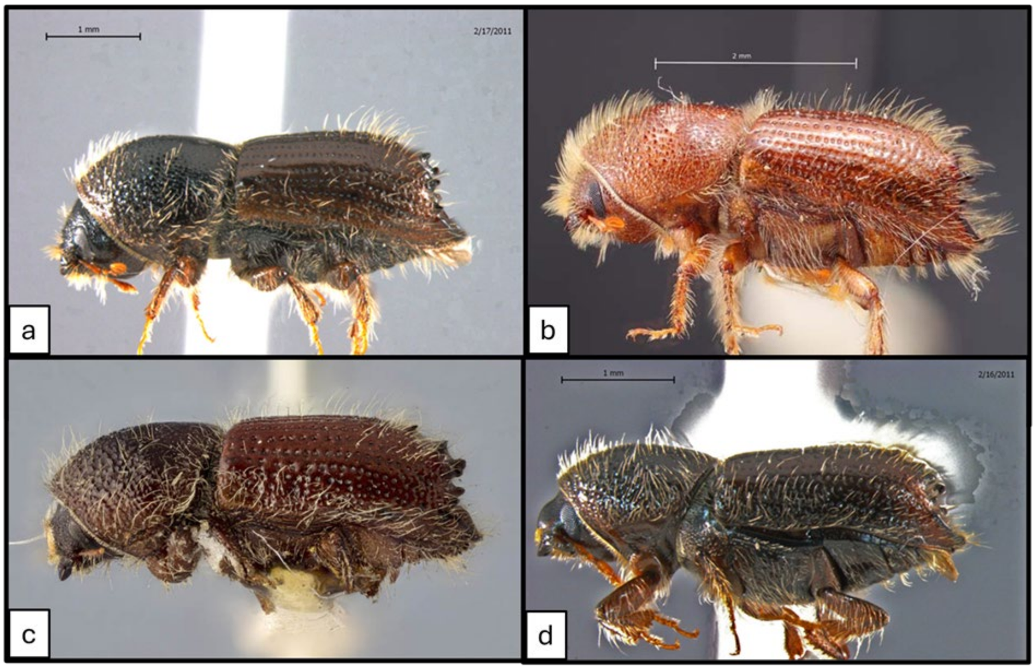


**Figure 9**. *Ips* species adults similar to *I. typographus* present in the United States: **(a)** *I. borealis;* **(b)** *I. hunteri*; **(c)** *I. pilifrons;* and **(d)** *I. tridens* (Sources: (a) Copyright 2011, University of Alaska Museum; (b) T.H. Atkinson, Barkbeetles.info (c) Images and data provided by the Canadian National Collection of Insects, Arachnids, and Nematodes (CNC), © His Majesty The King in Right of Canada, as represented by the Minister of Agriculture and Agri-Food, licensed under the Open Government License - Canada; and (d) Copyright 2011, University of Alaska Museum)

## Commonly Encountered Non-targets

The approved survey method for *I. typographus* is the Exotic Bark Beetle (EBB)/*Ips* lure, which includes the following components in a blend: cis-verbenol, ipsdienol, and 2-Methyl-3-buten-2-ol (MBO).

Bark beetles often captured during *I. typographus* surveys include *I. pini* and *I. tridens* as well as the closely related *Orthotomicus latidens* (Benzel, 2015).

Within the *Ips* genera, attracted species that are present in the United States include *I. avulsus* (small southern pine engraver), *I. bonanseai*, *I. borealis, I. calligraphus* (six-spined engraver beetle), *I. confusus* (Pinyon pine beetle), *I. cribricollis, I. grandicollis* (five-spined engraver beetle), *I. integer*, *I. knausi*, *I. paraconfusus* (California fivespined ips), *I. perturbatus* (northern spruce engraver) and *I. pini* (pine engraver) (El-Sayed, 2024).

Other bark beetles are attracted to one or more components of the lure blend and are present in the United States (Atkinson, 2024), including: *Carphoborus andersoni, C. intermedius, Dendroctonus brevicomis* (western pine beetle), *D. frontalis* (southern pine beetle), *D. jeffreyi* (Jeffrey pine beetle), *D. ponderosae* (mountain pine beetle), *D. terebrans* (black turpentine beetle), *D. valens* (red turpentine beetle), *Hylastes porculus, Hylurgus ligniperda* (red-haired bark beetle), *Gnathotrichus materiarius, Orthotomicus* *erosus* (Mediterranean pine engraver beetle), *O. latidens* (smaller western pine engraver), *Phloeosinus pini, Phloeotribus piceae, Pityogenes bidentatus* (bidentated bark beetle), *P. carinulatus, P. hopkinsi* (chestnut brown bark beetle), *P. knechteli*, *Pityokteines elegans, Pityophthorus opaculus, Pseudips mexicanus* (Monterey pine engraver)*, Tomicus piniperda* (large pine shoot beetle), and *Trypodendron lineatum* (striped ambrosia beetle).

Insects from multiple orders can be attracted to the components of this pheromone blend. Other beetles commonly attracted include longhorn beetles, clown beetles, leaf beetles, checkered beetles, darkling beetles, click beetles, snout beetles, and ambrosia beetles (El-Sayed, 2024).

## Biology and Ecology

*Ips typographus* can infest pole trees (young trees that are 4-10 inches in diameter at breast height) or mature trees (Evans, 2021). They usually attack stressed, weakened, and old trees (Furuta, 1989; Sauvard, 2004), but can infest healthy trees especially when populations reach outbreak levels (Chararas, 1962; Paynter et al., 1990; Weslien et al., 1989). Outbreaks have been observed following biotic or abiotic events such as diseases, drought, high temperatures, wind storms, hurricanes, and typhoons (Allen et al., 2010; Furuta, 1989; Jönsson et al., 2007; Schroeder and Lindelöw, 2002; Šimůnek et al., 2020; Weslien et al., 1989).

Like other bark beetles, *I. typographus* larvae and adults feed under the bark of trees and once adults are mature, they fly to find a new tree to colonize (Cognato, 2015; Knížek and Beaver, 2004). Trees are first colonized by males boring into the bark, creating a nuptial chamber, and secreting an aggregation pheromone that can attract 2-3 females (Chararas, 1962; Sauvard, 2004; Wermelinger, 2004). After mating, the females create galleries to deposit their eggs; these galleries can have a X or Y shape pattern, common among *Ips* species. (Fig. 5a,c) (Ciesla, 2011; Sauvard, 2004). Females can lay up to 150 eggs after mating and up to 100 more eggs if they leave the initial maternal gallery to bore and lay eggs in a second gallery (Anderbrant and Löfqvist, 1988; Mills, 1986; Wermelinger and Seifert, 1999). These broods, laid in separate galleries and known as 'sister generations' or 'sister broods', may occur in the same or different trees and do not require additional matings (Sauvard, 2004).

Larvae create feeding galleries that are perpendicular to the maternal galleries in a characteristic, species-specific pattern (Fig. 5b,c) (Sauvard, 2004). Larvae develop for 9 to 31 days before pupating in chambers at the end of each gallery (Chararas, 1962; Wermelinger and Seifert, 1998). Once molted into adults, they spend 11-17 days feeding under the bark until they reach maturity, when they fly in search of new trees to colonize (Sauvard, 2004; Wermelinger and Seifert, 1998). Adults generally fly on sunny days without wind, starting before noon until sunset (Annila, 1969; Chararas, 1959).

*Ips typographus* has 1-3 generations per year (Evans, 2021; Faccoli, 2009). In northern Europe, usually only one generation occurs (Bakke, 1983), while two generations are common in central Europe (Wermelinger and Seifert, 1999). Sister generations are common during outbreaks and females may lay up to three sister generations in a season (Anderbrant, 1989; Annila, 1969; Davídková and Doležal, 2017).

*Ips typographus* adults stop feeding in preparation for overwintering in the fall to early winter when temperatures drop below 41°F (Annila, 1969). *Ips typographus* adults overwinter in the leaf litter and soil around the tree, or under the bark of the infested tree Annila, 1969; Botterweg, 1982; Evans, 2021; Sauvard, 2004). Larvae and pupae can also overwinter under the bark of the host tree but typically they do not survive the winter (Annila, 1969). Adults emerge from overwintering sites in the spring when air temperatures are above 52 °F (Annila, 1969; Zumr, 1982).

*Ips typographus* are good fliers. In a mark-release-recapture experiment, some beetles were capable of flying 0.5 miles within 3 hours (Botterweg, 1982). In a flight-mill experiment, beetles could fly 4-6 hours with a flight speed between 3-7 ft/s (Forsse and Solbreck, 1985). Thus, there is potential for beetles to actively fly more than 10 miles (Sauvard, 2004), although new infestations often occur within 0.3 miles from infested trees (Mezei, 2025). Flight occurs on sunny days and is greatly influenced by temperature. Flight has been observed when air temperatures are above 62°F, (Botterweg, 1982; Lobinger, 1994; Sauvard, 2004) and mass flying occurs above 68°F (Bakke et al., 1977; Harding and Ravn, 1985). Flight does not occur when temperatures are greater than 85°F (Lobinger, 1994).

*Ips typographus* requires 520-557 degree-days to complete its development (Baier et al., 2007; Harding and Ravn, 1985). Minimum and maximum lethal temperature thresholds are -20°F and 120°F, respectively (Annila, 1969). Minimum and maximum developmental thresholds are 45°F and 105°F, respectively (Wermelinger and Seifert, 1998).

## Known Hosts

*Ips typographus* is a forest pest of several species in the Pinaceae family. It prefers spruce (*Picea* spp.), and its principal host tree is *Picea abies* (Norway spruce) (Chararas, 1962; Christiansen and Bakke, 1988; Sauvard, 2004). It prefers weakened or stressed trees but can infest healthy trees during outbreaks (Bakke, 1983; Mills, 1986). Older trees above 50 years are preferred to younger ones, although during outbreaks younger trees can be infested (Mezei, 2025; Vité, 1989). The beetle can be found in tree stands, fallen or stored logs, and in timber (Wermelinger, 2004).

*The host list below includes cultivated and wild plants that 1) are infected or infested by the pest under natural conditions, 2) are frequently described as major, primary, or preferred hosts, and 3) have primary evidence for feeding and damage documented in the literature. Plants are highlighted in bold if they are commercially produced and the pest causes economically significant damage.*

**Table 1.** Preferred hosts of *I. typographus*.

| Scientific Name | Common Name | Presence in the US* | Type/Use | Reference |
|---|---|---|---|---|
| ***Picea abies*** | Norway spruce | Present | Cultivated/ wild | Schroeder and Lindelöw, 2002 |
| *Picea asperata* | dragon spruce | Absent | Wild | Mukhina et al., 2016 |
| *Picea engelmannii* | Engelmann spruce | Present | Wild | Mukhina et al., 2016 |
| *Picea glauca* | white spruce | Present | Wild | Mukhina et al., 2016 |
| *Picea glehnii* | Sakhalin spruce | Absent | Wild | Furuta, 1989 |
| *Picea jezoensis* | Yeddo spruce | Absent | Wild | Furuta, 1989 |
| *Picea koraiensis* | N/A | Absent | Wild | Mukhina et al., 2016 |
| *Picea mariana* | black spruce | Present | Wild | Mukhina et al., 2016 |
| *Picea obovata* | Siberian spruce | Absent | Wild | Konôpková et al., 2020 |
| *Picea omorika* | Serbian spruce | Absent | Wild | Fiala et al., 2022 |
| *Picea orientalis* | Oriental spruce | Absent | Wild | Akkuzu et al., 2009 |
| *Picea pungens* | blue spruce | Present | Wild | Fiala et al., 2022 |
| *Picea rubens* | red spruce | Present | Wild | Mukhina et al., 2016 |
| *Picea schrenkiana* | Asian spruce | Present | Wild | Mukhina et al., 2016 |
| *Picea sitchensis* | Sitka spruce | Present | Wild | Bertheau et al., 2009 |

*Presence in the U.S. confirmed by USDA-NRCS, 2024

There is evidence of *I. typographus* infesting *Pseudotsuga menziesii* and some species within *Abies* and *Pinus,* but they are less preferred hosts (Bertheau et al., 2009; Karpov et al., 2024; Zivojinovic, 1960).

## Pest Importance

*Ips typographus* is considered the most damaging bark beetle of Asian and European conifer forests (Blake et al., 2024; Grégoire and Evans, 2004; Wermelinger, 2004). It has caused environmental, economic, and social impacts (Grégoire and Evans, 2004; Kamińska et al., 2021; Šimůnek et al., 2020).

In Europe, damage attributed to *I. typographus* has increased drastically, reaching an average of 30 million $yd^3$/year  of timber from 2010-2019 (Patacca et al., 2023). In Poland, an outbreak of *I. typographus* decimated the dominant conifer *Picea abies* in Białowieża Forest, a popular tourist destination (Jalinik and Hryniewicki, 2018; Kamińska et al., 2021). In Japan, *Ips typographus japonicus* has been reported as the most devastating pest of *Picea jezoensis* and *P. glehnii* (Furuta, 1989).

Increased temperatures, drought stress, and extreme weather (e.g., windstorms) can exacerbate damage by *I. typographus* by increasing the number or generations or expanding its ecological niche (Baier et al., 2007; Jakoby et al., 2019; Patacca et al., 2023). One outbreak from 2015 to 2018 had especially devastating losses (30 million $yd^3$ timber) due to the combined effect of drought and warmer temperatures (Šimůnek et al., 2020). In the Czech Republic, several windstorms have been followed by outbreaks of *I. typographus* infesting *Picea abies*, with losses generally in the range of 2 - 9 million $yd^3$ of timber (Šimůnek et al., 2020). Damage can be worsened by secondary infections of blue staining fungi that eventually lead to tree death (Paine et al., 1997; Wermelinger, 2004).

*Ips typographus* is listed as a harmful organism in Albania, Brazil, Canada, Colombia, Holy See (Vatican City State), India, Jordan, Monaco, Morocco, San Marino, Serbia, Taiwan, Turkey, United Kingdom and the European Union (USDA-PCIT, 2024). There may be trade implications with these countries if this pest becomes established in the United States.

## Pathogens or Associated Organisms Vectored

Plant pathogens associated with *I. typographus* include the blue staining ophiostomatoid fungi. Some of these fungi cause disease and blue staining on trees and lumber (Kirisits, 2004), but the status of *I. typographus* as a vector of pathogenic fungi to living trees remains unclear. Kirisits (2004) presented a comprehensive list of fungal organisms associated with *I. typographus*, including a diverse assemblage of blue-stain fungi. The most common blue-stain fungi associated with *Picea abies* include *Ceratocystiopsis minuta, Endoconidiophora polonica, Graphium fimbriasporum, G. pseudormiticum, Grosmannia penicillate, Ophiostoma ainoae, O. bicolor, O. japonicum, O. piceae, O. piceaperdum, Pesotum piceae* and *Pesotum* sp.

## Known Distribution

*Ips typographus* is native to Eurasia (Wermelinger, 2004).

Table 2. Countries where *I. typographus* is known to occur.

| Region/Continent | Country | Reference |
|---|---|---|
| Asia | China | Chang et al., 2019 |
| Asia | Iran | Beaver et al., 2016 |
| Asia | Japan | Furuta, 1989 |
| Asia | Kazakhstan | Sagitov et al., 2016 |
| Asia | Mongolia | Müller et al., 2013 |
| Asia | Tajikistan | Kadyrov, 1988 |
| Europe | Austria | Wegensteiner et al., 1996 |
| Europe | Belarus | Kharuk et al., 2016 |
| Europe | Belgium | Piel et al., 2005 |
| Europe | Bosnia and Herzegovina | Mujezinović et al., 2023 |
| Europe | Bulgaria | Doychev and Ovcharov, 2006 |
| Europe | Croatia | Bertheau et al., 2013 |
| Europe | Czech Republic | Wegensteiner et al., 1996 |
| Europe | Denmark | Forsse, 1991 |

| Region/Continent | Country | Reference |
|---|---|---|
| Europe | Estonia | Voolma et al., 2004 |
| Europe | Finland | Weslien, 1992 |
| Europe | France | Sallé et al., 2005 |
| Europe | Georgia | Kereselidze and Wegensteiner, 2007 |
| Europe | Germany | Schroeder and Lindelöw, 2002 |
| Europe | Greece | Bertheau et al., 2013 |
| Europe | Hungary | EPPO, 2024 |
| Europe | Italy | Faccoli, 2009 |
| Europe | Latvia | Pētersons, 2010 |
| Europe | Liechtenstein | Wermelinger et al., 2020 |
| Europe | Lithuania | Sallé et al., 2007 |
| Europe | Luxembourg | Sallé et al., 2007 |
| Europe | Montenegro | Roganović, 2013 |
| Europe | the Netherlands | Doom, 1979 |
| Europe | Norway | Bakke, 1989 |
| Europe | Poland | Grodzki et al., 2006 |
| Europe | Romania | Fora and Balog, 2021 |
| Europe/Asia | Russia | Konôpková et al., 2020 |
| Europe | Serbia | Markovic and Stojanovic, 2010 |
| Europe | Slovakia | Grodzki et al., 2006 |
| Europe | Slovenia | Sallé et al., 2007 |
| Europe | Sweden | Schroeder and Lindelöw, 2002 |
| Europe | Switzerland | Stadelmann et al., 2013 |
| Europe | Turkey | Akkuzu et al., 2009 |
| Europe | United Kingdom (England) | Blake et al., 2024 |
| Europe | Ukraine | Nikulina et al., 2015 |

EPPO (2024) reports that *I. typographus* is present in Algeria, Korea, and Moldova but we were unable to find direct evidence. *Ips typographus* is under eradication in the United Kingdom (England).

## Pathway

All life stages of *Ips typographus* can be spread within infested sawn timber, wooden products, or wood packing material (WPM) such as dunnage or case wood (crating) (Brockerhoff et al., 2006; Haack, 2006).

*Ips typographus* has commonly been reported at border interceptions in the United States and New Zealand (Brockerhoff et al., 2006; Haack, 2006). For example, it was intercepted in spruce (*Picea* sp.) logs used to brace shipments of granite blocks from

Norway to Canada (Humble and Allen, 1999). There have been 505 interceptions of *I. typographus* from 1914 to 2008 in shipments originating from over 25 countries at ports in 22 U.S. states, although interceptions have decreased since the 1990s (Ward et al., 2023).

*Ips typographus* is a strong flier capable of flying over 10 miles (Forsse and Solbreck, 1985). Some beetles fly above the tree canopy and can fly significant distances aided by wind (Forsse and Solbreck, 1985). Recent research suggests that *I. typographus* dispersed naturally from Belgium and France into England, corresponding to a dispersal distance of over 99 miles (Blake et al., 2024; Inward et al., 2024). Increased planting of *Picea abies* in Europe in the $19^{th}$ and $20^{th}$ centuries facilitated the expansion of the beetle's range through natural dispersal (Meurisse et al., 2019).

*Use the PPQ Commodity Import and Export manuals listed below to determine 1) if host plants or material are allowed to enter the United States from countries where the organism is present and 2) what phytosanitary measures (e.g., inspections, phytosanitary certificates, post entry quarantines, mandatory treatments) are in use. These manuals are updated regularly.*

**Agricultural Commodity Import Requirements(ACIR) manual:** ACIR provides a single source to search for and retrieve entry requirements for imported commodities. https://acir.aphis.usda.gov/s/

## Potential Distribution within the United States

Based on the known distribution of *I*. *typographus* and comparing those climates to Global Plant Hardiness Zones (Takeuchi et al., 2018), we expect that *I*. *typographus* could establish in plant hardiness zones 2-8.

Spruce trees (*Picea* spp.) are grown for timber, Christmas trees, and landscaping (Cregg, 2004; DCCEC, 2024; NCTA, 2024). Spruce is grown throughout the continental United States but Oregon, Ohio, Michigan, Idaho, and Minnesota are the top five states that together represent a value of over $62 million (USDA-NASS, 2019). While Christmas trees are hosts and are grown in multiple states (USDA-NASS, 2024) *I*. *typographus* requires older, large trees with thick phloem; therefore, these production areas are not considered at risk except in outbreak conditions.

*Picea* spp. can be found throughout the northern and western continental United States. The primary host, *P. abies* occurs in the northeast and mid-west, with some limited distribution on the west coast (Kartesz, 2015; USDA-NRCS, 2024).

All the above-mentioned regions and states represent a suitable climate for the establishment of *I. typographus* and therefore could be at risk.

## Survey and Key Diagnostics

**Approved Methods for Pest Surveillance*:**

For the current approved methods and guidance for survey and identification, see Approved Methods for Pest Surveillance (AMPS) pest page on the CAPS Resource and Collaboration website, at https://approvedmethods.ceris.purdue.edu/.

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## Versions

April 2011: Datasheet completed (Version 1)

July 2025 (Version 2)

- Updated synonyms in **Scientific Name** section
- Created new **Pest Recognition** section
- Added **Easily Mistaken Species** section
- Added **Commonly Encountered Non-targets** section
- Updated **Biology & Ecology** section
- Created a table for **Known Hosts** section
- Updated **Pest Importance** section with economic losses in various countries.
- Updated **Pathogens or Associated Organisms Vectored** section
- Created a table for **Known Distribution** section
- Updated **Pathway** section
- Updated **Potential Distribution within the United States** section

- Updated guidance for **Approved Methods** section.

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