EPPO Datasheet: *Monochamus maculosus*

Last updated: 2022-09-19

IDENTITY

Preferred name: *Monochamus maculosus*
Authority: Haldeman
Taxonomic position: Animalia: Arthropoda: Hexapoda: Insecta: Coleoptera: Cerambycidae
Other scientific names: *Monochamus mutator* Leconte
Common names: spotted pine sawyer
view more common names online...
EPPO Categorization: A1 list
view more categorizations online...
EPPO Code: MONCMC

Notes on taxonomy and nomenclature

Monochamus mutator LeConte, 1850 has also been widely used for this species throughout the literature.

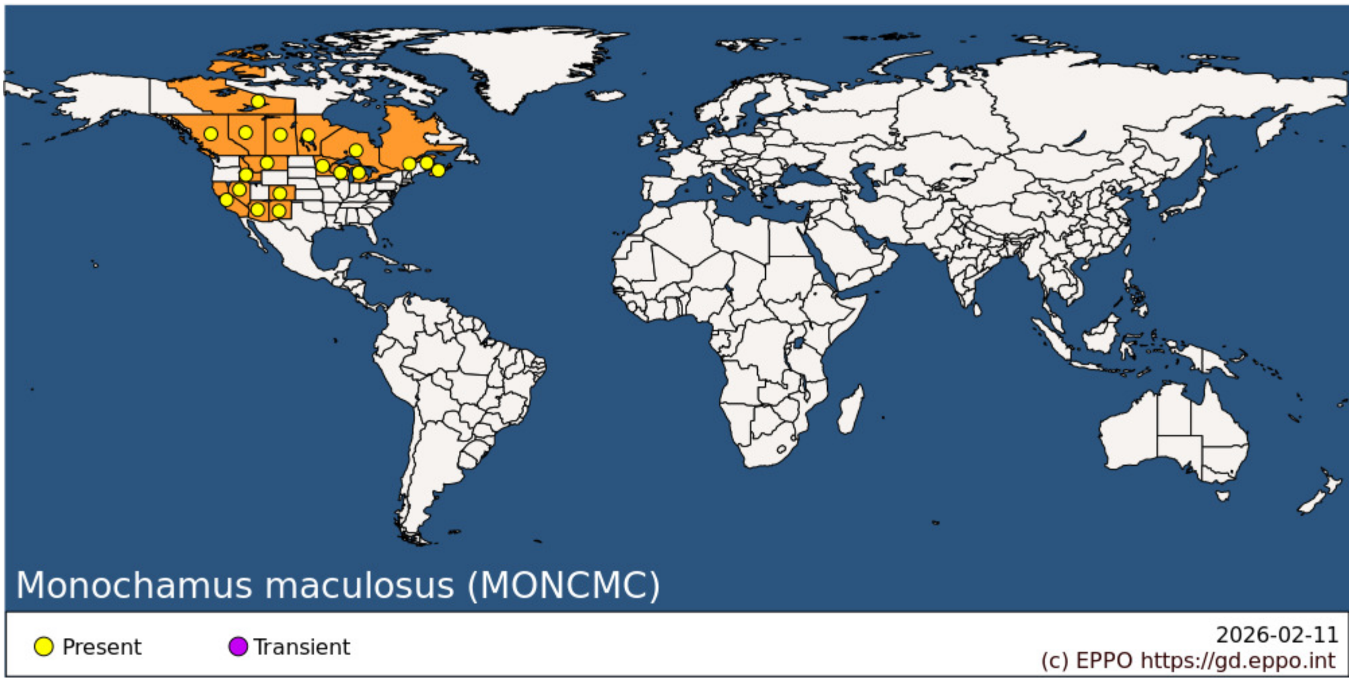
HOSTS

Monochamus maculosus has been recorded from two species of pines that are native to North America, *P. banksiana* and *P. resinosa*, neither species are important forest trees in Europe and *Psueudotsuga menziesii*. However, other *Pinus* species such as *P. sylvestris*, *P. pinaster* and *P. pinea* are among the most important forest species in Europe. *Pseudotsuga menziesii* is an important forest species in Europe.

Host list: *Pinus banksiana*, *Pinus resinosa*, *Pinus*, *Pseudotsuga menziesii*

GEOGRAPHICAL DISTRIBUTION

Monochamus maculosus is widely distributed in Canada and the USA. There is no indication in the literature that the distribution of the beetle is expanding.



North America: Canada (Alberta, British Columbia, Manitoba, New Brunswick, Northwest Territories, Nova Scotia, Ontario, Québec, Saskatchewan), United States of America (Arizona, California, Colorado, Idaho, Michigan, Minnesota, Montana, Nevada, New Mexico, Wisconsin)

BIOLOGY

Monochamus maculosus females lay eggs on fire-scorched, dying or recently felled pines or *Pseudotsuga menziesii* (Douglas-fir) trees. In Sevogle (New Brunswick, Canada), *M. maculosus* adults appear to have two population peaks. In 2013. the timing of the first peak was unknown, but the second peak appeared to be in mid-August, although this could have been an artefact relating to sampling frequency (Boone *et al.*, 2019). The flight period is from June to August (Linsley & Chemsak, 1984). The life cycle information below is generic information for *Monochamus* spp. from North America.

Mating usually occurs during sunny afternoons on the host. Soon after mating the female chews a slit in the bark and if the slit is suitably deep, she deposits a single egg, rarely two. Not all the slits contain eggs and as many as 75% of the slits may be abandoned. The females usually deposit eggs in the shady sides of the logs and avoid deep shade within the log decks or in heavily shaded areas of the forest. Oviposition occurs until the late summer.

The eggs hatch within 1 or 2 weeks and the larvae tunnel through the inner bark to the cambium within a few days. Young larvae feed on the inner bark, cambium and outer sapwood for several weeks, forming shallow excavations called surface galleries and filling them with frass. By mid to late summer, the larva chews a characteristic oval-shaped entrance hole into the heartwood. The excavated excelsior-like wood chips and frass are expelled from these galleries to the surface of the log. As the larvae grow older, they bore deep into the heartwood, and then turn around, typically when 10-15 cm from the wood surface, and bore back towards the surface, thereby forming a characteristic U-shaped tunnel. Once the larva has reached the surface, it widens the gallery into a pupal cell where it overwinters as a prepupa. The pupal cell is separated from the bark by a thin layer of wood. Pupation takes around two weeks after which the adult emerges by chewing a circular exit hole out through the remaining wood and bark. After emergence, adults need to feed on the living bark of young twigs to reach sexual maturation. This phase is obligatory before mating and subsequent oviposition. Generally, the life cycle is 2 years although sometimes only one. Because of the overlapping generations, the adults are found each year and may be more abundant in some years depending on the availability of host material and habitat conditions. There is a wide between- and within-species variation in adult longevity, from ca. 1 month to ca. 5 months (EFSA, 2018).

Miller (1986) studied the impact of excluding *Monochamus titillator* from freshly cut bolts (sections of a logs) of *Pinus taeda* on other insects. The presence of *Monochamus titillator* significantly reduced the number of emerging *Ips calligraphus*

(Coleoptera: Curculionidae), *Platysoma cylindricum* (Coleoptera: Histeridae) and *Medetera bistriata* (Diptera: Dolichopodidae).This demonstrates that reducing *Monochamus* spp. populations could lead to increased populations of other damaging species.

Dauer larvae of pine wood nematode, *Bursaphelenchus xylophilus* have been found in association with *M. maculosus* on *Pinus banksiana* and *Pinus resinosa* in Wisconsin Minnesota (Wingfield & Blanchette, 1983).

DETECTION AND IDENTIFICATION

Symptoms

The following signs and symptoms may be seen in wood infested with *Monochamus* spp. (Wilson, 1975):

1. Slits chewed by adult females for egg laying in the bark, although only a minority of these may have eggs in them,
2. Scoring in the xylem and phloem caused by larval feeding,
3. Frass – the waste expelled by feeding larvae from trees,
4. Oval shaped holes made by larvae as they bore deeper into sap wood,
5. Circular exit holes created by adults.

Morphology

There is no specific information on the juvenile stages of *M. maculosus,* the following descriptions are generic to *Monochamus* spp.

Eggs

Monochamus spp. eggs are white, elongate, cylindrical and slightly flattened, with rounded ends (Akbulut *et al.*, 2017). They are about 3 mm long and 1 mm in diameter.

Larvae

Monochamus spp. young larvae are soft-bodied, elongate, and dirty white in colour, with a light yellow thorax and an amber brown head. The final instar larvae have 10 abdominal segments, and the length of mature larvae is between 25 and 50 mm (Akbulut *et al.*, 2017).

Pupae

Monochamus spp. pupae resemble the adults with reduced wings, legs, antennae and mouthparts clearly visible. They are about 1.5-3 cm long.

Adult

Linsley and Chemsak (1984) provide a description of the adult *M. maculosus*:

'Male: Form moderate-sized to large, slightly tapering posteriorly; integument dark reddish-brown to piceous, elytra and appendages often paler reddish-brown; pubescence pale, gray and dark brown. Head rather small; front shallowly convex, finely, shallowly, confluently punctate, sparsely clothed with pale appressed pubescence, genae short, slightly convergent toward apex, median line shallow on front and vertex; antennae extending more than five segments beyond elytra, segments three to eight with minutely punctate sensory areas at apices, pubescence sparse, very short, appressed, becoming denser toward apical segments, eleventh segment slightly curved. Pronotum about as wide as long, lateral tubercles rounded at apices; disk with a shallow callus behind middle, middle transversely rugose; base and apex shallowly impressed; pubescence sparse, base of each lateral tubercle clothed with a patch of dense, pale appressed pubescence; prosternum transversely rugulose, sparsely pubescent; meso- and metasternum minutely, irregularly punctate, clothed with patches of white recumbent pubescence and longer, suberect hairs. Elytra over 2.5 times as long as broad; base with moderate number of rounded asperites, punctures behind moderately coarse, becoming finer toward apex; pubescence mottled, usually dark brown in elevated patches with gray patches in between; aspices narrowly rounded, sutures dentate. Scutellum white pubescent, broader than long, apex rounded. Legs moderately densely white pubescent, femora minutely densely punctate. Abdomen irregularly clothed with pale to fulvous recumbent pubescence; punctures sparse, minute; last sternite truncate at apex. Length 17-27 mm.

Female: form similar, sides parallel. Antennae with white annulate, extending at most three segments beyond elytra. Abdomen with last sternite broadly truncate at apex, each side with a tuft of black hairs. Length 17-25 mm.'

Detection and inspection methods

There is no specific information for *M. maculosus,* but *Monochamus* spp. are attracted to weakened, dying or dead host trees. Therefore, such trees, which often have partly or completely discoloured needles, should be the focus of surveillance for *Monochamus* spp. Close inspection may allow the detection of oviposition slits in the bark of dead or dying trees, oval-shaped larval entrance holes in the sapwood under the dead bark, or round adult exit holes in the sapwood. Larvae can also be extracted from the bark or sapwood, and adults can be found walking or resting on cut or dead wood during the summer (EFSA, 2018). The most efficient detection method is trapping (see below).

Linsley and Chemsak (1984) provide a key to North American cerambycidae in the subfamily Lamiinae, tribes Parmeninie through to Acanthoderini and *Monochamus* spp. are included in this. *Monochamus* spp. larvae can also be identified using DNA barcoding, but it has not been validated for all species (EFSA, 2018).

Traps

de Groot and Nott (2004) studied the response of *Monochamus* spp. to pheromones in stands of *Pinus banksiana* (jack pine), *Picea mariana* (black spruce) and *Abies balsamea* (balsam fir) in Ontario. They found no evidence that frontalin is a kairomone for *M. scutellatus* or *M. maculosus* or that ipsdienol was attractive to either species when either compound was used at release rates commonly used for bark beetles.

In a field and laboratory study, Fierke *et al.* (2012) provided evidence that monochamol is a component of the pheromone produced by male *M. scutellatus*. Field data also suggested that it is likely to be a pheromone for *M. notatus* and this gives support for the hypothesis that it is a pheromone for the genus *Monochamus*.

In a large study at 16 sites across North America, Miller *et al.* (2013) demonstrated that multiple-funnel traps baited with a blend of ipsenol, ipsdienol, ethanol and ?-pinene were attractive to the *M. titillator / M. carolinensis* complex, *M. scutellatus, M. clamator, M. obtusus* and *M. maculosus.* This mixture of four compounds, was more effective than unbaited traps or traps with a mixture of ipsenol and ipsdienol or traps with a mixture of ethanol and ?-pinene. Ethanol is produced by stressed conifer trees and ?-pinene is a constituent of the oleoresin of most pine species. Ipsenol and ipsdienol occur naturally in pine forests (Miller *et al*., 2013).

Ryall *et al*. (2015) provided evidence that monochamol is attractive to *M. scutellatus*, *M. notatus* and *M. carolinensis* which supported evidence from previous studies (e.g Fierke *et al*. , 2012; Allison *et al*., 2012), they also provided the first evidence that monochamol is attractive to *M. maculosus* and *M. marmorator*. The studies also demonstrated a synergism between monochamol and host volatiles. Allison *et al*. (2012) showed that monochamol is attractive to *M. titillator* as well as to traps baited with (2R*,3R*)-2,3-hexanediol plus -pinene (but not to traps baited with (2R*,3R*)-2,3-hexanediol alone). There is evidence showing that monochamol is attractive to 12 *Monochamus* species and so it has excellent potential for surveys of beetles of the genus (Ryall *et al*., 2015).

Miller *et al.* (2016) tested the efficacy of different combinations of ?-pinene, monochamol and ipsenol for catching *Monochamus* spp. in two Canadian provinces and eight states in the USA. The study provided evidence of the beneficial effect of including both monochamol and ipsenol in lures. Monochamol did not increase catches of other Cerambycidae, bark beetles, other weevils or bark beetle predators.

Boone *et al.* (2019) tested the efficacy of teflon-coated cross-vane traps with four lures monochamol: 2 mg/day; ipsenol: 2.5 mg/day, 2-methyl-3-buten-1-ol: 10 mg/day; and ?-pinene: 500 mg/day. Large numbers of *M. carolinensis* , *M. maculosus*, *M. notatus*, *M. scutellatus, M. clamator*, and *M. titillator* were trapped in North America, while large numbers of *M. alternatus* were trapped in China. This result demonstrated that such traps could be used for the detection of non-native *Monochamus* spp. in Europe.

PATHWAYS FOR MOVEMENT

There is no specific information on pathways of movement for *M. maculosus* and thus the following information is generic to the Genus. *Monochamus* spp. are able to naturally disperse by flight. A number of dispersal studies have been carried out with *Monochamus* spp. For example, *Monochamus alternatus* adults were shown to be able to disperse 3.3 km from infested logs to diseased trees (Kobayashi *et al.*, 1984). In a mark-recapture experiment in Spain, *Monochamus galloprovincialis* (Olivier) flew a maximum of 22.1 km with around 2% of beetles flying further than 3 km (Mas *et al.*, 2013).

Pinewood nematode, which is vectored by *Monochamus* spp. has been found to be able to spread at a mean rate of 5.3 km per year in Portugal (de la Fuente *et al.*, 2018), 6 km / year in Japan (Togashi & Shigesada, 2006) and an estimated 7.5 km per year in China (Robinet *et al.*, 2009). However, long distance human assisted spread of pine wood nematode can occur over much larger distances with an annual mean of 111-339 km estimated in China (Robinet *et al.*, 2009).

Monochamus spp. can be spread in coniferous wood and coniferous wood packaging material, dunnage, particle wood and waste conifer wood, hitchhiking and in finished wood products (EFSA, 2018, Ostojá-Starzewski, 2014). Adults can be transported within containers as hitch hikers (EFSA, 2018). Between 1998 and 2018 there were 124 interception records of *Monochamus* spp. on wood packaging material in the EU (EFSA, 2018). Between 1984 and 2008, there were 42 interceptions of *Monochamus* spp. on wood packaging material in the USA which were identified to species level: *M. alternatus* (17), *M. carolinensis* (Oliver) (2), *M. clamator* (Leconte) (1), *M. galloprovincialis* (Oliver) (5), *M. sartor* (Fabricius) (5), *M. scutellatus* (Say) (2), *M. sutor* (Linnaeus) (9) and *M. tesserula* White (1) (Eyre & Haack, 2017). *Monochamus* spp. females lay their eggs in various parts of host trees, including smaller branches down to 2 cm in diameter. Plants for planting are considered to be an unlikely pathway for the spread of *Monochamus* spp. as they usually attack weakened or dead trees and weakened trees are unlikely to be traded (EFSA, 2018).

PEST SIGNIFICANCE

Economic impact

There is little information on the impacts of *M. maculosus,* but the species is damaging to fire-scorched, dying or recently felled pines or *P. menziesii* (throughout the Western States (Keen, 1952).

Monochamus spp. are not considered to be plant pests in their own right because they do not tend to attack healthy trees. However, they can cause damage to timber and facilitate the introduction and spread of pine wood nematode in Europe (EFSA, 2018).*Monochamus* spp. rarely, if ever, attack vigorously growing trees (Gibson, 2010). However, the impact of *Monochamus* spp. in the USA is high, largely due to export restrictions of forestry products associated with pine wood nematode (Miller *et al.*, 2013). In the USA, larvae of *Monochamus* species are responsible for extensive damage to fire damaged, dying, recently felled conifers of various species—but especially pines, spruce, true firs, and Douglas-fir. The larvae damage infested trees and logs through a series of extensive mines that introduce decay-causing fungi (Baker, 1972, Gibson, 2010). Wood chips harvested from wood infested by *Monochamus* species can be too small for use at pulp mills (Wilson, 1962).

Control

The EU introduced emergency measures to prevent the spread of pinewood nematode within the Union (EU, 2012). These measures include demarcating areas, destruction of contaminated material, heat treatment of wood and wood products, hygiene protocols for forestry vehicles and transport conditions for plants, wood and bark (EFSA, 2018). Debarking of harvested wood can reduce risks from *Monochamus* spp. (EFSA, 2018).

Wilson (1962) studied attacks by wood boring insects on stacks of felled balsam fir, *Abies balsamea* in Minnesota, USA. *M. scutellatus* was the most frequently observed cerambycid beetle, accounting for approximately 90-95% of all beetles observed. *M. notatus* and *M. marmorator* were also occasionally observed and the principles are likely to apply to all *Monochamus* spp. Piles of wood placed in full shade suffered less damage than wood exposed to the sun. Also, standard piles with less wood exposed to beetle damage suffered less damage than piles stacked in 'pens' with wood stacked in open perpendicular layers. The average volume of wood lost from standard piles of wood over two years in the sun ranged from 0.47% of interior logs to 2.64% for exterior logs and for piles in the shade from 0.37% for interior logs to 0.59 % for exterior logs. Damage to felled wood can be reduced by: i) transporting wood as soon as possible after felling; ii) placing in wood in the shade of other trees; iii) covering wood in a layer of 45 cm of slash; iv) stacking wood in standard piles to reduce the area exposed to beetle attacks; v) removing bark from felled wood; vi) immersing logs in water; vii) applying insecticides to exposed wood (Wilson, 1962, Wilson, 1975). *Monochamus* damage can be prevented by not exposing wood during the July-September egg laying period and minimized by processing any infested wood as soon as possible (Gibson, 2010). It is possible for timber to become infested during transit; measures to reduce this risk include: not transporting wood through infested areas; not transporting wood during the flight season or covering the wood during transit (EPPO, 2018).

Phytosanitary risk

The introduction of non-native *Monochamus* spp. such as *M. maculosus* into Europe could introduce pine wood nematode to new locations and hosts, and enhance the rate of spread of the pest. Pinewood nematode has caused severe damage to forests in East Asia and in Europe and the impacts are likely to increase (EFSA, 2018). *M. maculosus* is a potential vector of pine wood nematode (Akbulut & Stamps, 2012).

PHYTOSANITARY MEASURES

There are no phytosanitary measures specific to *M. maculosus.* Recommended phytosanitary measures to reduce the risk of the introduction and spread of non-European *Monochamus spp.* and pinewood nematode are set out in the EPPO commodity standard for Coniferae, PM 8/2 (3) (EPPO, 2018). There are recommendations by host species to reduce the risk of introducing pine wood nematode or its *Monochamus* spp. vectors on wood. One method of safely obtaining host wood is to source if from pest free areas. Wood can also be treated to kill any pests that are present within it and / or prevent it becoming infested. The following treatments are recommended: heat treatment according to EPPO Standard PM 10/6: Heat treatment of wood to control insects and wood-borne nematodes (EPPO, 2009); treating with ionizing radiation according to EPPO Standard 10/8: Disinfestation of wood with ionizing radiation (EPPO, 2009) or appropriate fumigation with details specified on the phytosanitary certificate (EPPO, 2018). It is possible for timber to become infested during transit; measures to reduce this risk include: not transporting wood through infested areas; not transporting wood during the flight season or covering the wood during transit (EPPO, 2018).

The treatment of wood according to ISPM 15: Regulation of wood packaging material in international trade (IPPC, 2019) will reduce the risk of the introduction of xylophagous pests such as *Monochamus* spp. and pine wood nematode being introduced to previously uninfested areas in wood packaging material, although treatments are not always applied effectively (Haack *et al.*, 2014).

REFERENCES

Akbulut S & Stamps WT (2012) Insect vectors of the pinewood nematode: a review of the biology and ecology of *Monochamus* species. *Forest Pathology* **42**, 89-99.

Akbulut S, Togashi K & Linit MJ (2017) Cerambycids as plant disease vectors with special reference to pine wilt. In *Cerambycidae of the world*, pp. 209-252. CRC Press, Boca Raton, Florida.

Baker WL (1972) *Eastern forest insects*. U.S. Dept. of Agriculture, Forest Service, Washington.

Boone CK, Sweeney J, Silk P, Hughes C, Webster RP, Stephen F, Maclauchlan L, Bentz B, Drumont A, Zhao B, Berkvens N, Casteels H & Gregoire J-C (2019) Monochamus species from different continents can be effectively detected with the same trapping protocol. *Journal of Pest Science* **92**, 3-11.

Bousquet Y (1991) Checklist of beetles of Canada and Alaska. Agriculture Canada.

de Groot P & Nott RW (2004) Response of the whitespotted sawyer beetle, *Monochamus s. scutellatus*, and associated woodborers to pheromones of some Ips and Dendroctonus bark beetles. *Journal of Applied Entomology* **128**, 483-487.

de la Fuente B, Saura S, Beck PSA & Fortin M-J (2018) Predicting the spread of an invasive tree pest: The pine wood nematode in Southern Europe. *Journal of Applied Ecology* **55**, 2374-2385.

EFSA (2018) Pest categorisation of non-EU *Monochamus* spp. *EFSA Journal* **16**, 5435.

EPPO (2009) Disinfestation of wood with ionizing radiation. *EPPO Bulletin* **39**, 34-35.

EPPO (2009) Heat treatment of wood to control insects and wood-borne nematodes. *EPPO Bulletin* **39**, 31-31

EPPO (2018) PM 8/2 Coniferae. *EPPO Bulletin* **48**, 463-494.

EU (2012) Commission implementing decision on emergency measures to prevent the spread within the Union of *Bursaphelenchus xylophilus* (Steiner et Buhrer) Nickle et al. (the pine wood nematode). In *2012/535*, Brussels.

Eyre D & Haack RA (2017) Invasive cerambycid pests and biosecurity measures. In *Cerambycidae of the world: Biology and management*, pp. 563-618. CRC Press, Boca Raton.

Fierke MK, Skabeikis DD, Millar JG, Teale SA, McElfresh JS & Hanks LM (2012) Identification of a male-produced aggregation pheromone for Monochamus scutellatus scutellatus and an attractant for the congener Monochamus notatus (Coleoptera: Cerambycidae). *Journal of Economic Entomology* **105**, 2029-34.

Gibson K (2010) Management guide for sawyer beetles.

Haack RA, Britton KO, Brockerhoff EG, Cavey JF, Garrett LJ, Kimberley M, Lowenstein F, Nuding A, Olson LJ, Turner J & Vasilaky KN (2014) Effectiveness of the International Phytosanitary Standard ISPM No. 15 on reducing wood borer infestation rates in wood packaging material entering the United States. *PLoS ONE* **9**, e96611.

IPPC (2019) ISPM 15: Regulation of wood packaging material in international trade. Rome.

Junk W (1921) *Coleopterorum Catalogus*, Berlin.

Keen FP (1952) Insect enemies of western forests. pp. 273.

Kobayashi F, Yamane A & Ikeda T (1984) The Japanese pine sawyer beetle as the vector of pine wilt disease. *Annual Review of Entomology* **29**, 115-135.

Lindquist EE & Wu KW (1991) Review of mites of the genus *Mucroseius* (Acari, Mesostigmata, Ascidae) associated with sawyer beetles (Cerambycidae, *Monochamus* and *Mecynippus*) and pine wood nematodes Aphelenchoididae, *Bursaphelenchus xylophilus* (Steiner And Buhrer) Nickle , with descriptions of 6 new species from Japan and North-America, and notes on their previous misidentification. *Canadian Entomologist* **123**, 875-927.

Linsley E & Chemsak J (1984) *The Cerambycidae of North America Part VII, No. 1: taxonomy and classification of the subfamily Lamiinae, tribes Parmeninie through Acanthoderini*. University of California.

Mas H, Hernández R, Villaroya MG, Sánchez G, Pérez-Laorga E, González EG, Ortiz AL, Lencina J, Rovira J, Marco M, Pérez, Gil MAI, Sánchez-García FJ, Bordón P & Pastor C (2013) Comportamiento de dispersión y capacidad de vuelo a larga distancia de Monochamus galloprovincialis (Olivier 1795).

Miller DR, Allison JD, Crowe CM, Dickinson DM, Eglitis A, Hofstetter RW, Munson AS, Poland TM, Reid LS, Steed BE & Sweeney JD (2016) Pine Sawyers (Coleoptera: Cerambycidae) Attracted to ?-Pinene, Monochamol, and Ipsenol in North America. *Journal of Economic Entomology* **109**, 1205-1214.

Miller DR, Dodds KJ, Eglitis A, Fettig CJ, Hofstetter RW, Langor DW, Mayfield AE, 3rd, Munson AS, Poland TM & Raffa KF (2013) Trap lure blend of pine volatiles and bark beetle pheromones for Monochamus spp. (Coleoptera: Cerambycidae) in pine forests of Canada and the United States. *Journal of Economic Entomology* **106**, 1684-92.

Miller MC (1986) Within-tree effects of bark beetle insect associates on the emergence of *Ips calligraphus* (Coleoptera, Scolytidae). *Environmental Entomology* **15**, 1104-1108.

Ostojá-Starzewski JC (2014) Imported furniture – A pathway for the introduction of plant pests into Europe. *EPPO Bulletin* **44**, 34-36.

Robinet C, Roques A, Pan H, Fang G, Ye J, Zhang Y & Sun J (2009) Role of human-mediated dispersal in the spread of the pinewood nematode in China. *PLoS ONE* **4**, e4646.

Togashi K & Shigesada N (2006) Spread of the pinewood nematode vectored by the Japanese pine sawyer: Modeling and analytical approaches. *Population Ecology* **48**, 271-283.

Wilson LF (1962) Insect damage to field-piled pulpwood in northern Minnesota. *Journal of Economic Entomology* **55**, 510-516 pp.

Wilson LF (1975) White spotted sawyer. In *Forest Pest Leaflet 74*.

Wingfield MJ & Blanchette RA (1983) The pine-wood nematode, *Bursaphelenchus xylophilus,* in Minnesota and Wisconsin - insect associates and transmission studies. *Canadian Journal of Forest Research-Revue Canadienne De Recherche Forestière* **13**, 1068-1076.

ACKNOWLEDGEMENTS

This datasheet was prepared in 2022 by Dominic Eyre (Defra, GB). His valuable contribution is gratefully acknowledged.

How to cite this datasheet?

EPPO (2026) *Monochamus maculosus*. EPPO datasheets on pests recommended for regulation. Available online. https://gd.eppo.int

Datasheet history

This datasheet was first published online in 2022. It is maintained in an electronic format in the EPPO Global Database. The sections on 'Identity', 'Hosts', and 'Geographical distribution' are automatically updated from the database. For other sections, the date of last revision is indicated on the right.

Co-funded by the European Union