Xylosandrus mutilatus **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Coleoptera	Scolytidae

Common name camphor shot-borer (English), camphor shoot beetle (English)

Synonym *Xyleborus banjoewangi* , Schedl
Xyleborus sampsoni , Eggers
Xyleborus taitinus , Eggers

Similar species *Xylosandrus crassiusculus*

Summary Xylosandrus mutilatus comes from a family of beetles commonly referred to as bark beetles. Xylosandrus mutilatus construct galleries in the xylem of host trees which can eventually cause mortality in its host. These galleries also degrade wood products and when it attacks valuable broadleaf species there can be significant economic impacts on lumber industries. Many bark beetles are also known to be vectors of fungal pathogens but it is not known what fungal pathogens Xylosandrus mutilatus may or may not be harbouring.

view this species on IUCN Red List

Species Description
Xylosandrus mutilatus's head is completely hidden by the pronotum in dorsal view, the antennal club appears obliquely cut, and the body is generally smooth and shining. *Xylosandrus* spp. are distinguished from related genera (*Xyleborus*, *Xyleborinus*, *Ambrosiodmus*) by the stout body, truncate elytral declivity, and non-contiguous procoxae. *X. mutilatus* is larger (>3mm) than any other species of *Xylosandrus* present in the U.S., but is most easily recognized by the elytra, which are shorter than the pronotum. *X. mutilatus*'s declivity is without punctures, dull and granulate. Larvae are typical Scolytidae. They are white, c-shaped, legless grubs with an amber coloured head capsule (Rabaglia, 2003).
Examination of adults by a taxonomist with expertise in the family Scolytidae is required for positive identification to species. The adults and larval galleries have sufficient characteristics to permit entomologists to make field identifications at least to genus (Rabaglia, 2003).
Symptoms of attack by *X. mutilatus* include pin-hole-sized holes in the bark that are either bleeding or have a light coloured boring dust. The galleries in the xylem consist of a short horizontal entrance and a 1-4cm long central, vertical gallery with short brood chambers. Attacked trees may have wilting foliage or twig dieback (Rabaglia, 2003).

Lifecycle Stages
Xylosandrus mutilatus is univoltine with overwintering adult females making dispersal flights from June to August. These females search for suitable host material to establish a gallery. *X. mutilatus* apparently prefers host material of a rather small diameter. Once a female has found a suitable host, she creates a gallery system and inoculates the gallery walls with spores of the ambrosia fungi from her mycangia, a pair of dorsal pouches formed by the intersegmental membrane between the pronotum and mesonotum. From 1 to 38 eggs are laid per gallery. The females maintain the gallery and protect its entrance and will plug the entrance hole with her body as a defense against predators and other enemies. Egg hatching begins about one week after oviposition and the larvae feed on the white coloured mycelium of the ambrosia fungus. Larvae pupate two to three weeks later, and adults eclose about a week after pupation (Rabaglia, 2003; and Schiefer and Bright, 2004).

Habitat Description
Xylosandrus mutilatus has a wide host range. Reported hosts in its natural range include: *Acer* spp., *Albizzia* spp., *Benzoin* spp., *Camellia* spp., *Carpinus laxiflora*, *Castanea* spp., *Cinnamomum camphora*, *Cornus* spp., *Cryptomeria japonica*, *Fagus crenata*, *Lindera erythrocarpa*, *Machilus thurnbergii*, *Ormosia hosiei*, *Osmanthus fragrans*, *Parabezion praecox*, *Platycarpa* spp., and *Sweitenia macrophylla*. Hosts in the southeastern U.S., where this insect has become established, are presently unknown. (Rabaglia, 2003), although The US Forest Service (2003) did find a black walnut plantation in Tennessee infested with *X. mutilatus*.

Reproduction
As is typical of xyleborine ambrosia beetles, *Xylosandrus mutilatus* has extremely inbred polygamy. Mating occurs within the gallery immediately after eclosion. Only one to three males develop in each gallery, and these remain in the gallery and mate with more than one of their later-emerging sisters. The males die soon after mating, and the females overwinter within the gallery (Rabaglia, 2003; and Schiefer and Bright, 2004).

General Impacts
Xylosandrus mutilatus is established in two southeastern states in the U.S., but its ability to adapt to new hosts, compete with indigenous ambrosia beetles or cause significant damage is not completely known. Its potential to spread to new areas is high: female adults are capable of flight and can travel 2-3 km in search of suitable hosts. They are subject to dispersal by air currents. *X. multilatus* has a high reproductive potential, a broad host range and cryptic habits, which would make it difficult to detect and eradicate (Rabaglia, 2003).
X. multilatus construct galleries in the xylem of host trees. These galleries, and the staining caused by their associated fungi, degrade wood products. If this insect should attack valuable broadleaf species such as oaks, ash, walnut, etc., this insect could have a significant effect on the hardwood lumber industry. Moreover, plant quarantine measures designed to slow its rate of spread could have an adverse effect on transport of hardwood logs and lumber from infested to uninfested areas. Since this insect appears to have a preference for small diameter material, it could become a pest of urban trees, especially those stressed by recent planting. (Rabaglia, 2003).
In North America, considering the diverse climatic conditions present in its native range, it seems likely that *X. mutilatus*'s distribution will eventually encompass much of the eastern United States (Schiefer and Bright, 2004).
Many ambrosia beetles indirectly impact host trees by vectoring fungal pathogens but currently there is no information on what, if any, fungal pathogens *X. mutilatus* might be harboring (Campbell, 2004).

Management Info
Preventative measures: In 2002, United Nation FAO's (Food and Agriculture Organization) Interim Commission on Phytosanitary Measures imposed a global standard for treating wood packaging International Standard for Phytosanitary Measures No. 15 to stop the spread of invasives.
Rabaglia (2003) reports that, \"Control of ambrosia beetles like *X. mutilatus* is often difficult and impractical. Some insecticides may be effective as preventative treatments or on infested material. Heat, water and fumigants are also used on wood products infested by ambrosia beetles.\"

Pathway
Scolytids were the most commonly intercepted group of insects found in association with solid wood packing materials in Chile and New Zealand (Haack, 2003).Since this species may attack small trees, it may also be transported in nursery stock (Rabaglia, 2003).Scolytids were the most commonly intercepted group of insects found in association with solid wood packing materials in Chile and New Zealand (Haack, 2003).

Principal source: Rabaglia, 2003 *Xylosandrus mutilatus*
Schiefer and Bright, 2004. *Xylosandrus mutilatus* (Blandford), An Exotic Ambrosia Beetle (Coleoptera: Curculionidae: Scolytinae: Xyleborini) New to North America

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BIBLIOGRAPHY

10 references found for **Xylosandrus mutilatus**

Managment information

California Department of Food and Agriculture. 2003. *Asian Ambrosia Beetle*. Plant Pest Diagnostics Center - Entomology Laboratory and Coleoptera Systematics.
Summary: Available from: http://www.cdfa.ca.gov/phpps/ppd/Entomology/Coleoptera/Ambrosia.html [Accessed 23 December 2005]

Campbell, F. 2004. *An ambrosia beetle - Xylosandrus mutilatus Blandford*. The Nature Conservancy: The Global Invasive Species Initiative: Gallery of Pests: Recently Introduced Exotic Forest Insects.
Summary: Available from: http://tncweeds.ucdavis.edu/products/gallery/xylmu1.html [Accessed 23 December 2005]

Haack, R. A. 2001. Intercepted Scolytidae (Coleoptera) at U.S. ports of entry: 1985–2000 *Integrated Pest Management Reviews* 6: 253–282.
Summary: Information on interception of Scolytidae, at US ports, origin and frequency.

International Plant Protection Convention (IPPC), 2002. International Standards for Phytosanitary Measures (ISPM) No. 15 (2002) with modifications to Annex I (2006) Guidelines for regulating wood packaging material in international trade (PUBLICATION)
Summary: Available from: https://www.ippc.int/servlet/BinaryDownloaderServlet/133703_ISPM15_2002_with_Ann.pdf?filename=1152091663986_ISPM_15_2002_with_Annex1_2006_E.pdf&refID=133703 [Accessed November 20]

Rabaglia R. 2003. *Xylosandrus mutilatus*. North American Forest Commission Exotic Forest Pest Information System (NAFC-ExFor).
Summary: Available from: http://spfnic.fs.fed.us/exfor/data/pestreports.cfm?pestidval=149&langdisplay=english [Accessed 23 December 2005]

Schiefer, T. L., D. E. Bright. 2004. *Xylosandrus mutilatus (Blandford), an exotic ambrosia beetle (Coleoptera: Curculionidae: Scolytinae: Xyleborini) new to North America*. The Coleopterists Bulletin, 58(3):431-438. 2004.
Summary: Available from: http://www.bioone.org/bioone/?request=get-document&issn=0010-065X&volume=058&issue=03&page=0431 [Accessed 19 February 2006]

General information

Coyle, D.R; Booth, D.C; and Wallace, M.S., 2005. Ambrosia Beetle (Coleoptera: Scolytidae) Species, Flight, and Attack on Living Eastern Cottonwood Trees. J. Econ. Entomol. 98(6): 2049-2057
Summary: Available from: http://www.bioone.org/bioone/?request=get-document&issn=0022-0493&volume=098&issue=06&page=2049 [Accessed 20 February 2006]

Florida Department of Agriculture & Consumer Services, 2005. Pest Alert Two Asian Ambrosia Beetles Recently Established in Florida (Curculionidae: Scolytinae)
Summary: Available from: http://www.doacs.state.fl.us/pi/enpp/ento/x.glabratus.html [accessed 5 March 2006]

Invasive.org. 2005. *camphor shoot beetle*. The Bugwood Network, USDA Forest Service and USDA APHIS PPQ.
Summary: Available from: http://www.invasive.org/browse/subject.cfm?sub=9579 [Accessed 23 December 2005]

US Forest Service. 2003. *2003 Forest Insect and Disease Conditions for the Southern Region*.Forest Health Protection: Southern Region.
Summary: Available from: http://www.cdfa.ca.gov/phpps/ppd/Entomology/Coleoptera/Ambrosia.html [Accessed 23 December 2005]