

*Xylosandrus compactus* 正體中文

**System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Coleoptera	Scolytidae

**Common name** ambrosia beetle (English), Dunkler-Holzbohrer (German), black twig borer (English)

**Synonym**

**Similar species**

**Summary**

Originally from Asia, *Xylosandrus compactus* has spread to many coffee growing areas throughout the world where it causes damage not only to agricultural crops, but also to native forest trees. Beetles (Coleoptera) in the family Scolytidae, to which *Xylosandrus compactus* belongs, are among the most damaging insects worldwide. Because most scolytids breed under bark or inside wood, it has long been recognised that scolytids can easily be moved through international trade.



[view this species on IUCN Red List](#)

**Species Description**

"The black twig borer is a very small (1/16 inch), shiny, black, cylindrical beetle. Twig entrance holes are about 1/32 inch in diameter and usually found on the lower surface of the twig. Eggs are extremely small, oval, white and translucent. Black twig borer grubs are white and legless. The body of young grubs is pointed at the rear. Older grubs have a brownish heads and round tails. The pupa is about the size of the adult and clearly shows the legs,wings and head." (Baker, 1994). *Xylosandrus compactus* belongs to the Xyleborini tribe, all of which feed on ambrosia fungus and are called ambrosia beetles.

**Lifecycle Stages**

The black twig borer, *Xylosandrus compactus*, is one of the few ambrosia beetles that attacks healthy plants! This beetle is very small, dark and more or less oval in top view. The largest specimens are just over one-sixteenth inches long.

The life cycle of the black twig borer is completed in about a month. Female beetles attack twigs or branches and bore in to the pith (or if the twig is large, they bore into the wood about half to one and one half inches). Black twig borers are capable of laying eggs without mating (parthenogenesis). After the females bore into a twig, they form a small chamber in which the mostly female eggs are laid. The tiny eggs (less than 1mm long) are smooth, white ovals laid over a period of several weeks. They hatch three to five days after being laid. Larvae are grubs, white and legless. The tiny grubs feed on the fungi that grow on the walls of the brood chamber. The grubs pupate and then (if males happen to have developed) the new beetles mate before leaving the twig to infest new twigs. The pupae are initially white, changing to light brown with black wings (female) near maturity. This process takes at least 6 days. Female adults, initially light brown, turn shiny black in 3 to 4 days; females are 1.6-1.8mm long (about 1/16 in). Males are about half as long and incapable of flight. After emerging from the pupal stage they turn from light brown to reddish brown in 3 to 4 days. If the twig is small, only one female will attack it. If the twig is more robust, up to 20 females will attack it. In the summer it takes about a month from egg to adult beetles. In the winter, development is much slower. The adults overwinter inside the damaged twigs.

Over 224 plant species in 62 families are susceptible to the black twig borer.

## Habitat Description

There are more than 200 recorded hosts of the black twig borer, some of them are the orchids *Cattleya*, *Dendrobium*, *Epidendrum*, *Vanda*; other hosts include anthurium, avocado, citrus, coffee, cacao, brushbox (*Tristania conferta*), turpentine tree (*Syncarpia glomulifera*), paper-bark (*Melaleuca leucadendron*), red-ironbark eucalyptus (*Eucalyptus sideroxylon*), blackbutt eucalyptus (*E. pilularis*), robust eucalyptus (*E. robusta*), Koa haole (*Leucaena glauca*), guava, vervain (*Stachytarpheta jamaicensis*), Christmasberry ([Schinus terebinthifolius](#)) floral red ginger, litchi, macadamia, mango, mahogany, hibiscus, kukui, star jasmine, pikake, periwinkle, Surinam cherry (Hara & Tenbrink, 1994) etc.

## Reproduction

Black twig borers spend the majority of their lives inside the host plant. The exception is the adult female, which leaves the gallery by way of the parent's entrance hole and establishes a new gallery elsewhere. Each year sees several generations.

## Nutrition

Adult beetles bore into trees to lay eggs and introduce a mutualistic fungus "ambrosia" that serves as food for adult and larval beetles.

## General Impacts

At least one of the fungi in the ambrosia is *Fusarium solani*. Infested twigs usually dieback to a point below the brood chamber. Although the ambrosia usually does not kill the whole plant, the dieback of twigs can have considerable impact on the appearance of infested trees and shrubs.

Female black twig borers tunnel into woody twigs, leaving pin-sized entry holes. Once inside they excavate galleries and lay eggs. This excavation, along with the introduction of pathogens, is the cause of damage to the host. Ambrosia beetles are serious pests of forest trees and, to a lesser extent, shade and fruit trees. Most ambrosia beetles attack primarily weak or unhealthy plants; however, the black twig borer is known to attack healthy plants as well, which makes it a potentially very serious pest to native forest trees as well as other plants. Damage is not caused by feeding, since the beetle larvae feed on ambrosia introduced by the female. Infestation by one to three females is sufficient to kill the twig or branch. Infestation becomes apparent when die-back of twigs and branches occurs. A severe infestation can kill host plants, including large trees (Hara & Tenbrink, 1994).

Ambrosia beetles can be important pests of nursery production. Beetles sometimes introduce pathogenic fungi or bacteria. Fungi growing in trees can block water and sugar conducting tissues, producing tree wilting, dieback, or death.

## 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.

Maintaining healthy trees and shrubs is the first line of defence against the ambrosia beetles attacking weak hosts. This includes proper fertility, maintaining proper soil pH, and adequate soil moisture. Pruning and destruction of beetle-infested plant material is essential. Good tree care to promote tree vigor and health will help in resisting infestation or recovering from infestation.

**Chemical:** Chemical control is not the best option for these beetles since the host is already very weak or dying. However studies show that Chlorpyrifos provided 83% mortality of all stages of the black twig borer infesting flowering dogwood in Florida (Mangold *et al.*, 1977). Hata & Hara (1989) reported 100% mortality of adult females with chlorpyrifos. Marsden in 1972 recommended malathion (not to be applied to blooming orchids).

**Biological:** Literature on natural enemies indicates that the black twig borer is parasitized by at least one species of eulophid wasps of the genus *Tetrastichus*. Nine species of this genus, all accidentally or purposely introduced, are in Hawai'i; whether any are parasitizing black twig borer is not recorded" (Nishida, 1992).



## Pathway

Scolytids, such as the black twig borer, are commonly intercepted in food products such as seeds and nuts. Scolytids, such as the black twig borer, are among the most commonly intercepted families of insects on solid wood packing materials at U.S. ports of entry, representing 9394% of all reported insects. Similarly, scolytids were the most commonly intercept

## Principal source:

**Compiler:** IUCN/SSC Invasive Species Specialist Group (ISSG)

**Review:** Dr Anthony Cognato Department of Entomology Texas A&M University USA

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## ALIEN RANGE

[1] AFRICA

[1] BRAZIL

[1] FIJI

[1] INDIA

[1] JAPAN

[1] MALAYSIA

[1] PAPUA NEW GUINEA

[1] SOLOMON ISLANDS

[1] TROPICAL AFRICA

[1] VIET NAM

[1] AMERICAN SAMOA

[1] CUBA

[1] GUINEA

[3] INDONESIA

[1] MADAGASCAR

[1] MAURITIUS

[1] SEYCHELLES

[1] SRI LANKA

[6] UNITED STATES

**Red List assessed species 3: CR = 3;**

[Alectryon macrococcus](#) CR

[Flueggea neowawraea](#) CR

[Colubrina oppositifolia](#) CR

## BIBLIOGRAPHY

26 references found for *Xylosandrus compactus*

### Management information

[Ambrosia Beetles. Entomology Insect Information Series Clemson University Cooperative Extension Service.](#)

**Summary:** A factsheet with good images of damage, useful for identification, information on control and management.

[Baker, J.R. 1994. \(Revised\) Bambara, S., 2001. Insect Notes. Department of Entomology. North Carolina State University.](#)

**Summary:** A good biological description of the beetle in North Carolina and a little control information.

Available from: <http://www.ces.ncsu.edu/depts/ent/notes/O&T/trees/note106/note106.html> [Accessed 12 August 2003].

[Bugwood, 2001. Black Twig Borer Biological Control. From: Frank, J. Howard and John L. Foltz, 1997, Classical Biological Control of Pest Insects of Trees in the Southern United States: A Review and Recommendations. USDA, FS, FHTET-96-20.](#)

**Summary:** Brief sentence on biological control.

Available from: <http://www.bugwood.org/barkbeetles/Biocontrol/blacktwigborer.html> [Accessed 12 August 2003].

Clausen, C. P. 1978. Scarabaeidae. pp. 277-292 in Clausen, C. P. (ed.) Introduced parasites and predators of arthropod pests and weeds: a world review. US Department of Agriculture, Agriculture Handbook no. 480: vi + 545.

Davis, C. J. and Chong, M. 1970. Recent introductions for biological control in Hawaii. XIV. Proceedings of the Hawaiian Entomological Society, 20[1969]: 317-322.

Davis, C. J. and Krauss, N. L. H. 1967. Recent introductions for biological control in Hawaii. XI. Proceedings of the Hawaiian Entomological Society, 19[1966]: 201-207.

Drizd, Lara., Undated. The Black twig borer: A Study Of The Damage Done To Unprotected Hawaiian Coffee

**Summary:** Impact study of Black twig borer on Coffee in Hawaii.

[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.

Hill, D. S. 1983. Agricultural insect pests of the tropics and their control. Second edition. Cambridge University Press, Cambridge, UK. xii + 746 pp.

[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](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]

[IUCN 2010. IUCN Red List of Threatened Species. Version 2010.4.](#)

**Summary:** The IUCN Red List of Threatened Species provides taxonomic, conservation status and distribution information on taxa that have been globally evaluated using the IUCN Red List Categories and Criteria. This system is designed to determine the relative risk of extinction, and the main purpose of the IUCN Red List is to catalogue and highlight those taxa that are facing a higher risk of global extinction (i.e. those listed as Critically Endangered, Endangered and Vulnerable). The IUCN Red List also includes information on taxa that are categorized as Extinct or Extinct in the Wild; on taxa that cannot be evaluated because of insufficient information (i.e. are Data Deficient); and on taxa that are either close to meeting the threatened thresholds or that would be threatened were it not for an ongoing taxon-specific conservation programme (i.e. are Near Threatened).

Available from: <http://www.iucnredlist.org/> [Accessed 25 May 2011]

Mangold, J. R., R. C. Wilkinson, & D. E. Short. 1977. Chlorpyrifos sprays for control of *Xylosandrus compactus* in flowering dogwood. J Econ. Ent. Soc. 70: 789-790.

Nelson, R. E. & C. J. Davis. 1972. Black twig borer, a tree killer in Hawaii. USDA Forest Service Research Note PSW 274. U. S. Dept of Ag.: Berkeley, CA.

[Nishida, G. M. and Evenhuis, N. L. 2000. Arthropod pests of conservation significance in the Pacific: A preliminary assessment of selected groups. In Invasive Species in the Pacific: A Technical Review and Draft Regional Strategy. South Pacific Regional Environment Programme, Samoa: 115-142.](#)

**Summary:** Discusses over a dozen of the worst arthropod pests in the South Pacific, with particular emphasis on ants and their control and management.

Wolfenbarger, 1973. Attack of the beetle *Xylosandrus compactus* on the Avocado pear with data on its control. *Revista Peruana de Entomologia*. 16(1).(1974) 1-2.

Yoshida *et al.*, 1975. Control of the harmful insects in timbers by irradiation doses required for kill sterilization and inhibition of emergence in 3 species of ambrosia beetles Xyleborini in Japan. *Japanese Journal of Applied Entomology & Zoology*. 19(3).193-202.

**Summary:** Information on control by irradiation of timber.

## General information

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Dixon, W. N. & R. E. Woodruff. 1982. The black twig borer, *Xylosandrus compactus* (Eichhoff) (Coleoptera: Scolytidae). Florida Dept. Agric. & Consumer Serv. Division of Plant Industry. Entomology Circular No. 250.

[FI DOF. BLACK TWIG BORER. Florida division of Forestry. State of Florida. All rights reserved.](#)

**Summary:** Some biological information.

Available from: [http://www.fl-dof.com/Pubs/Insects\\_and\\_Diseases/insects\\_hbs\\_black\\_twig\\_borer.htm](http://www.fl-dof.com/Pubs/Insects_and_Diseases/insects_hbs_black_twig_borer.htm) [Accessed 12 August 2003].

Hara, A. H. and Beardsley, Jr. J. W. 1979. The biology of the black twig borer, *Xylosandrus compactus* (Eichhoff), in Hawaii. Proceedings of the Hawaiian Entomological Society 23: 55-70.

[ITIS \(Integrated Taxonomic Information System\), 2005. Online Database \*Xylosandrus compactus\*](#)

**Summary:** An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.

Available from:

[http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p\\_action=containing&taxa=Xylosandrus+compactus&p\\_format=&p\\_ifx=plgt&p\\_lang =](http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p_action=containing&taxa=Xylosandrus+compactus&p_format=&p_ifx=plgt&p_lang =) [Accessed March 2005]

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**Summary:** Biology

[Pena J.E. \*et al.\*, 1998 \*Phytoparasitica\* 26\(2\):1-20 A Review of the Pest Management Situation in Mango Agroecosystems.](#)

Samuelson, G. A. 1981. A synopsis of Hawaiian Xyleborini (Coleoptera: Scolytidae). *Pacific Insects* 23: 50-92.

[Tilakaratna., D. Hysiplyla Shoot Borers of Meliaceae in Sri Lanka. Forestry Research Centre, Kumbalpol, Boyagane, Sri Lanka](#)