Anoplophora glabripennis 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae

Common name ALB (English), Asian longhorned beetle (English), starry sky beetle (English), longicorne Asiatique (French), Asiatischer Laubholzkäfer (German)

Synonym *Anoplophora nobilis*

Similar species *Alaus oculatus, Anoplophora chinensis, Eburia quadrigeminata, Glycobius speciosus, Leptoglossus occidentalis, Monochamus notatus, Monochamus oregonensis, Monochamus scutellatus, Monochamus titillator, Plectrodera scalator, Prionus laticollis, Rosalia funebris*

Summary The Asian longhorn beetle *Anoplophora glabripennis* is a large wood-boring beetle that is native to countries in Asia, such as Japan, Korea and China. The beetle spends most of its life within the inner wood of a variety of hardwood trees as larvae which tunnel and feed on the cambium layer, eventually killing the tree. It was first detected in New York 1996, although it is thought to have arrived in the 1980s in solid wood packing material from China. It has since been detected in Massachusetts, New Jersey, Illinois, California, Ontario (Canada) and parts of Europe. The Asian longhorn beetle threatens 30-35% of the trees in urban areas of eastern USA. The economic, ecological and aesthetic impacts on the United States would be devastating if the beetle continues to spread. Potential losses have been estimated in the tens to hundreds of billions of US dollars. Current control measures focus on rapidly delimiting new infestations, imposing quarantine and cutting down and burning of infected trees.

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Species Description
Adult Asian longhorn beetles are jet-black with a luster; 20-35mm in length and 7-12mm in width, the base of the 11-segmented antennae is whitish with a blue-black colour; the antennae of male and female beetles are 1.5 and 1.3 times their body length, respectively; and each elytron has about 20 white (sometimes yellow) spots.
Please see PaDIL (Pests and Diseases Image Library) Species Content Page Beetles: Asian longhorn beetle for high quality diagnostic and overview images.

Lifecycle Stages
Asian longhorn beetles spend about 7 days within the pupal chamber as an adult before exiting the natal host (China). Longevity of female and male beetles was 42.5 days (14-66 days) and 20.6 days (3-50 days), respectively, on Populus spp. (China), and 73 days on *A. saccharum* (Keena 2000), and 103.9 days (44-131 days), 97.2 days (30-137 days) and 83.0 days (58-107 days) on *A. platanoides*, *A. rubrum* and *S. nigra*, respectively (Smith *et al*. 2002). Asian longhorn beetles are strong fliers and results from mass mark recapture studies show that 98% of adult beetles disperse less than 600m from their release point. However, Asian longhorn beetles dispersal potential over a single season was found to be 1,029m and 1,442m, for male and gravid female beetles, respectively (Smith *et al*. 2002).

Habitat Description
Habitats of the Asian longhorn beetle include urban (ornamentals), agricultural (windbreaks), rural (shelterbelts and hedgerows) and forests. In its native range, adult beetles infest deciduous trees, particularly species of *Populus* (15 poplar species), *Salix* (*S. matsudana*), *Ulmus* (*U. pumila*, *U. laeuig*), and *Acer* (*A. buergerianum*, *A. davidii*, *A. grosseri*, *A. negundo*, *A. palmatum*, *A. palmatum* cv. '*alropurpureum'*, *A. robustrum*, *A. saccharum*, *A. truncatum*). Other species have been listed as hosts, including *Aesculus chinensis* (horsechestnut), *Alnus* sp., *Betula platyphylla* (birch), *Elaeagnus angustifolia*, *Fraxinus* sp., *Hippophae rhamnoides* L. ssp., *Malus sylvestris*, *Sinensis* (buckthorn), *Platanus orientalis* (london plane/sycamore), *Prunus* sp. (questionable), *Pyrus communis* (questionable), *Robinia pseudoacacia* (questionable) and *Tilia tuan* (lindens/basswood), some of which may not be suitable for beetle development (e.g. oviposition only), and others that need verification.

Reproduction
Sexual reproduction: female Asian longhorn beetles mate multiple times with a single male beetle, but will also mate with multiple male beetles. Female beetles continue to produce eggs throughout their life span. Male beetles display mate guarding. Differences in the nutrional quality of various host trees, including secondary substances, and/or structural features (i.e. bark thickness), likely influence the relative reproductive potential and longevity of the beetles.
Lifetime fecundity of *Anoplophora glabripennis* averaged 35 eggs/female (30-80 eggs) on *Populus* spp. (China), and 68 eggs/female on *A. saccharum* (Keena 2000), and 127.3, 46.8 and 30.7 viable eggs/female on *A. platanoide*, *A. rubrum* and *S. nigra*, respectively (Smith *et al*. 2002). Daily oviposition of viable eggs averaged 1.2, 0.46 and 0.36 eggs/d on *A. platanoides*, *A. rubrum* and *S. nigra*, respectively (fecundity declines at 0.48 eggs per week over the lifetime of female beetles) (Smith *et al*. 2002). Fecundity is negatively correlated with bark thickness (Smith *et al*. 2002). Pre-ovipositional period of the Asian longhorn beetles was 10.6, 16.7 and 15.8 days on *A. platanoides*, *A. rubrum* and *S. nigra*, respectively (Smith *et al*. 2002).

Nutrition
Adult Asian longhorn beetle are known to feed on leaves, petiole and twigs.They appear to attack healthy trees (under investigation), as well as stressed trees.

General Impacts
The Asian longhorn beetle attacks hardwood tree species in the eastern United States, including many that are valued in both urban and forested areas. The beetle completes most of its life cycle inside the host tree, with adults emerging in spring. Adult beetles feed on twigs, leaf petioles and primary leaf veins. Eggs are injected under the bark surface where they hatch into larvae. Larvae tunnel under the bark and destroy the tree's vascular system which disrupts sap flow of infested trees. Older larvae tunnel into the heartwood where their feeding slowly destroys the structural integrity of trees (Smith and Wu 2008). Trees are slowly killed over a 3-5 year period, although it may be longer.
In their native China about 40% of poplar plantations are known to have been damaged (ca. 2.3 million ha.) by the beetle. 240 cities or counties have been infested in 5 provinces alone (totaling 230 thousand ha), and, an estimated 50 million trees were cut down over a 3 year period in Ningxia Province alone (1991-1993). The beetle causes severe damage from 21-43 degrees north latitude and 100-127 degrees east longitude (represents 4 climatic zones in China: the Transitional Zone between the tropical zone to the south and the warm temperate zone to the north; and the warm temperate zone; the cool temperate zone, and the arid temperate zone).
In the United States, where the beetle was discovered in 1996, an estimated 30-35% of trees in urban eastern states are susceptible to its attack. If the beetle continues to expand its range the potential impacts would be devastating. Urban areas could lose as much as 35 percent of their tree canopy cover and 30 percent of their trees (1.2 billion trees), with an estimated loss of value of $669 billion (GAO 2006). The maple hardwood lumber and sugar maple syrup industries are also put at risk, and tourism associated with the famous fall colours of New England (Smith and Wu 2008). Loss of trees may also decrease property values, cause aesthetic damage and lessen environmental benefits such as cleaning air and water and providing energy-conserving shade. These losses are difficult to quantify (GAO 2006).
If the beetle spreads out of its current urban environment into natural forests, it has the potential to seriously alter the ecological diversity of the natural forests in North America, with additional impacts on wetlands. The potential impact to forests is the loss of 71 billion trees valued at over $2 trillion dollars (GAO 2006).
A further impact of the Asian longhorn beetle in the United States is the cost of eradication measures. "Collectively, from 1997 to 2006, APHIS and the states of New York, Illinois and New Jersey and local governments have spent more than $800 million on ALB eradication measures" (Smith and Wu 2008).

Management Info
The eradication programme implemented by the US Animal and Plant Health Inspection Service (APHIS) and its cooperators hinges on several elements: rapidly delimiting new infestations, imposing quarantine, and implementing control measures within the quarantine zone. When the Asian longhorn beetle is reported, intensive visual inspections are conducted throughout the neighborhood to delimit the infestation. Infested trees and those species considered to be at high-risk of attack within a radius of 400mtrs from the edge of the known infestation (the distance varies with locality) are felled and chipped. High-risk trees within a radius of a second 400mtrs are also either removed and chipped or injected with a systemic insecticide. APHIS and US Forest Service scientists and their collaborators have developed a method of using the systemic insecticide, imidacloprid, which has been shown to kill adult beetles while feeding on twigs and leaves, thereby helping to contain the spread of the beetle. The infested area is re-surveyed at least once a year for the next five years after beetles are found (Smith and Wu 2008).
The primary pathway by which the Asian longhorn beetle has reached the USA and other countries is in wood packing materials. The Asian longhorn beetle has been intercepted frequently at ports and found in warehouses throughout the United States. This pathway highlights the importance of quarantine and regulations as a first line of defense for countries against invasion by Asian longhorn beetle and other pests (Smith and Wu 2008).
Please follow this link for detailed information on preventative measures, integrated management, and physical, chemical and biological control measures that can be undertaken to prevent the spread of the Asian longhorn beetle

Pathway
The Asian longhorn beetle is transported on infested fire wood, containers, pallets & dunage.

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[3] GERMANY
[1] POLAND
[14] UNITED STATES

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Summary: Invasive forest pests have seriously harmed our environment and imposed significant costs upon our economy. The U.S. Department of Agriculture (USDA) is the lead agency for responding to forest pests. This report evaluates the federal response to three invasive forest pests the Asian longhorned beetle, the emerald ash borer, and the pathogen Phytophthora ramorum (P. ramorum).Specifically, GAO describes (1) the status of efforts to eradicate these species, (2) the factors affecting the success of those efforts, (3) overall forest health monitoring programs, (4) coordination and communication of the three pest response efforts, and (5) USDA s use of panels of scientific experts to aid in the response efforts.
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Summary: PaDIL (Pests and Diseases Image Library) is a Commonwealth Government initiative, developed and built by Museum Victoria s Online Publishing Team, with support provided by DAFF (Department of Agriculture, Fisheries and Forestry) and PHA (Plant Health Australia), a non-profit public company. Project partners also include Museum Victoria, the Western Australian Department of Agriculture and the Queensland University of Technology. The aim of the project is: 1) Production of high quality images showing primarily exotic targeted organisms of plant health concern to Australia. 2) Assist with plant health diagnostics in all areas, from initial to high level. 3) Capacity building for diagnostics in plant health, including linkage developments between training and research organisations. 4) Create and use educational tools for training undergraduates/postgraduates. 5) Engender public awareness about plant health concerns in Australia. PaDIL is available from : http://www.padil.gov.au/aboutOverview.aspx, this page is available from: http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=266 [Accessed 6 October 2006]

General information

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Summary: English:
The species list sheet for the Mexican information system on invasive species currently provides information related to Scientific names, family, group and common names, as well as habitat, status of invasion in Mexico, pathways of introduction and links to other specialised websites. Some of the higher risk species already have a direct link to the alert page. It is important to notice that these lists are constantly being updated, please refer to the main page (http://www.conabio.gob.mx/invasoras/index.php/Portada), under the section Novedades for information on updates.
Invasive species - insects is available from: http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Insectos [Accessed 30 July 2008]
Spanish:
La lista de especies del Sistema de informaci n sobre especies invasoras de m xico cuenta actualmente con informaci n aceca de nombre cient fico, familia, grupo y nombre com n, as como h bitat, estado de la invasi n en M xico, rutas de introducci n y ligas a otros sitios especializados. Algunas de las especies de mayor riesgo ya tienen una liga directa a la p gina de alertas. Es importante resaltar que estas listas se encuentran en constante proceso de actualizaci n, por favor consulte la portada (http://www.conabio.gob.mx/invasoras/index.php/Portada), en la secci n novedades, para conocer los cambios.
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