GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Anoplophora chinensis***

Anoplophora chinensis **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Animalia	Arthropoda	Insecta	Coleoptera	Cerambycidae

Common name

Synonym

Melanauster chinensis , Forster
Anoplophora chinensis , Breuning 1944
Anoplophora malasiaca malasiaca , Samuelson 1965
Anoplophora perroudi , Pic 1953
Anoplophora sepulchralis , Breuning 1944
Callophora afflicta , Thomson 1865
Callophora luctuosa , Thomson 1865
Calloplophora abbreviata , Thomson 1865
Calloplophora malasiaca , Thomson 1865
Calloplophora sepulcralis , Thomson 1865
Cerambyx chinensis , Forster 1771
Cerambyx farinosus , Houttuyn 1766
Cerambyx sinensis , Gmelin 1790
Cerambyx pulchricornis , Voet 1778
Lamia punctator , Fabricius 1777
Melanauster chinensis , Matsumura 1908
Melanauster chinensis macularius , Kojima 1950
Melanauster chinensis , var. *macularia* Bates 1873
Melanauster chinensis , var. *macularis* Matsushita 1933
Melanauster chinensis , var. *Sekimacularius* Seki 1946
Melanauster macularius , Kolbe 1886
Melanauster malasiacus , Aurivillius 1922
Melanauster perroudi , Pic 1953
Anoplophora malasiaca , Thomson

Similar species

Summary

Both the citrus and Asian longhorn beetles originate from Eastern Asia where they seriously damage forest and agricultural plant hosts; both pose a potential economic and ecological threat to urban and natural environments where they are introduced in North America and Europe. Phytosanitary standards and regulations are the basis for preventative management to avoid unintentional international movement of such plant pests.

[view this species on IUCN Red List]

Species Description

The eggs are 5.5 millimeters by 1.7 millimeters, elongate, sub-cylindrical, smooth-surfaced, and tapering at both ends; initially creamy white, they turn yellowish-brown when ready to hatch (Lieu 1945, in Gyeltshen and Hodges 2005). Larvae are typical round-headed woodborers. The legless grubs are 5 millimeters long at the time of hatching and grow to a size of 52 millimeters. They are a creamy white with some yellow/amber chitinzed patterns on the prothorax and a brown mark on the front side (Gyeltshen and Hodges 2005; MAF 2005). The pupa is 27 to 38 millimeters long; it has elytra that only partially covers the membranous hind wings and curves around to the ventral surface of the body (Gyeltshen and Hodges 2005).
The adult citrus longhorn has a typical cerambycid beetle body shape. Females are larger than males; the male is 25 millimeters long and the female is 35 millimeters long. The beetle is glossy black to blue-black (following emergence from the tree) and finely punctuated (bearing tiny dots or points) with a series of irregular white hair spots on the elytra (EPPO Undated; Walker 2008). (The elytra is a modified, hardened forewing of certain insect orders, notably beetles). The elytra of females is parallel whereas the elytra of males is distally tapered (Walker 2008). The antennae have 11 segments, the joints of the antennae are black with a blue-grey base; this gives them a striped appearance. The antennae are longer than the body (1.7 to 2 times the body-length in males and 1.2 times the body-length in females) (Walker 2008). The pronotum has a prominent pointed process on both sides. (The pronotum is the upper surface of the prothorax; the shape of the pronotum is often important in identification of beetles.)
Detection of any cerambycid beetle suspected to be *Anoplophora* is cause for concern. Positive identification of *A. chinensis* is made from the adult stage. The tubercles on the base of the elytra are an important identification characteristic, however, positive identification is best left to a expert cerambycid taxonomist (NAFC 2001).
These beetles spend most of their life (one to two years) as larvae inside a trunk or root. Up to 90% of the *A. chinensis* population may be below ground level (Herald *et al* 2006). There may be little or no signs of their presence. This pest is most likely to be seen in July and August, but interceptions have occurred as early as May and as late as October (Ministry for resources and Rural Affairs Malta undated).
Characteristic signs of *A. chinensis* in the field include: 1) Emergence holes: At the end of the pupal stage adults emerge leaving a distinct round or slightly oval shaped exit hole on the bark surface (EPPO 2007; NAFC 2001). Holes are typically 6 to 11 millimeters in diameter (Ministry for resources and Rural Affairs Malta Undated). One study found that holes are usually located on the base of the trunk between five and 20 centimeters from the ground (Jucker *et al*. 2006).
2) Piles of sawdust : Frass is often left at the base of trees or branches as beetles emerge from holes in summer (MAF 2005). Sawdust or frass forms an average of 29 days following oviposition/egg-laying (Jucker *et al*. 2006).
3) Sap oozing: In some host-plants (often in *Platanus* sp.) sap may ooze from the *A. chinensis* galleries (EPPO 2007).
Characteristic signs of *A. chinensis* in bonsai trees include (USDA APHIS n.d., in NAFC 2001): Scraped sections of bark; Chewed leaves; T-shaped slits cut in the bark where females deposit eggs; and Sawdust-like frass (wood-pulp) around small holes (larval tunnels) in the wood (found under loose or thin bark).

Notes

Anoplophora malasiaca (Forster) and *A. chinensis* (Thomson) cover one single species of harmful organism (Commission Of The European Communities 2008).

Lifecycle Stages

The citrus longhorn takes one to two years to complete its development; larvae may be present throughout the year (CABI 2004, Lieu 1945, in Gyeltshen and Hodges 2005; NAFC 2001). In a small Italian study the adults observed (in cages) lived an average of 55.6 days (Jucker *et al*. 2006).
Fertilised females move to the base of a tree, around the collar or on main roots, to search appropriate places to lay eggs. With its mandibles, the *A. chinensis* female begins making a small incision, 3-4 mm long, through the bark, transversally to the axis of the trunk or of the root. When an appropriate place has been found, the female inserts its ovipositor in the prepared incision and injects an egg perpendicularly to the incision, within the bark (more or less at one half of its thickness). Under the pressure of the ovipositor inserted within the bark, the upper layer of bark cracks so that the visible final symptom of an egg laid is a reverse T-shape crack of the bark. A single egg is deposited in each incision. At the intersection of the arms of the T-shape crack, one can see a tiny ovoid hole made during the insertion of the ovipositor. This hole is plugged with some brown secretion from the female’s abdomen. This fluid hardens on contact of air, making a stopper that closes the entrance of the egg chamber (EPPO, 2007).
A study by Jucker and collegues (2006) found that, in Italy, the highest number of ovipositions (egg-laying) per week was recorded between the end of July and mid August. The findings indicated that: (i) the maximum height of the oviposition scars on the trunk increases as the number of eggs laid on the plant increases, (ii) the eggs have a 76% probability of hatching, (iii) the hatching rate decreases as the number of eggs laid on the plant increases.
Incubation lasts 15-20 days depending on the temperature (EPPO 2007). The young larvae hatch out in one to three weeks and feed on the green, sappy portion of the inner bark. The first instar larva is around 6 millimeters in length; it chews the bark around the egg chamber and enlarges it. The second instar larva bores a gallery to the cambium layer and feeds on the latter. The third instar larva bores a gallery within the phloem and in the external layer of the xylem boring irregular tunnels deep into the woody tissue (EPPO 2007; NAFC 2001). (An instar is a developmental stage between each successive moult until sexual maturity is reached). Full-grown larvae are 50 to 60 millimeters in length (EPPO 2007).
Findings from a small North Italian study indicate that larvae overwinter at various stages of their development (depending on the time of egg laying) and resume intense feeding during spring, pupating and emerging as adults in late May-early June (EPPO 2007).
The pupal stage lasts for four to six weeks (Gyeltshen and Hodges 2005). Pupation and adult development takes place in the wood, often in the upper part of the feeding area (EPPO undated; NAFC 2001).
At the end of the pupal stage, the adults stay inside the pupal chamber for about week during which their exoskeleton hardens; adults emerge leaving a distinct round or slightly oval shaped exit hole on the bark surface (EPPO 2007; NAFC 2001). In China adults emerge from April to August, with a peak from May to July (Florida Department of Agriculture Consumer Services 2004).

Habitat Description

This insect finds suitable host plants in forest, urban and fruit producing areas (NAFC 2001). The citrus longhorn beetle is not exclusive to citrus orchards but may infest a great variety of fruit and nut trees as well as forestry plantations and horticultural plants.

Reproduction

Egg-laying starts about 12 days after the introduction of the male into the cage (Jucker *et al*. 2006). Another source indicates that egg-laying begins a week after copulation (EPPO undated). Under rearing conditions, Lieu (1945, in Gyeltshen and Hodges 2005) observed an average fecundity of 15 eggs laid per female, but the female is potentially able to lay a significantly larger number of eggs. In a small Italian preliminary study by Jucker and collegues (2006) 23 females laid seven to 67 eggs each (350 in total) giving an average of 15 eggs per female. Other sources indicate that each female lays about 70 eggs one by one under the bark of the trunk, from just above the soil surface to 60 cm higher (EPPO undated).
A. chinensis females lay most of their eggs around tree collars. The larvae develop downwards and many of them tunnel. 90% of the *A. chinensis* population is below ground level.

Nutrition

Larvae tunnel through and obtain nutrition from woody portions of the plant. Adult longhorn beetles feed on the bark, leaves and leaf petioles of the host plant (NAFC 2001). *A. chinensis* is a polyphagous longhorn beetle feeding on many different kinds of food and plant species. The citrus longhorned beetle has been recorded on over a 100 recorded species (Lingafelter and Hoebeke 2002). Many of these are important species in the arborculture, forestry and agricultural industries. *A. chinensis* may infest species in the following plant families (Lingafelter and Hoebeke 2002, in NAFC 2001): Aceraceae (maple), Anacardiaceae, Araliaceae, Betulaceae (birch), Eleangaceae, Fagaceae (beech, chestnut, oak), Lauraceae (laurel), Oleaceae (ash), Polygonaceae, Styracaceae, Rutaceae, Rosaceae, Salicaceae (poplar and willow), Ulmaceae (elm), Moraceae (mulberry), Meliaceae, Leguminosae, Juglandaceae (walnut), Aquifoliaceae, Platanaceae (sycamore), Euphorbiaceae, Casuarinaceae, Verbenaceae , Sapindaceae, Theaceae and Taxodiaceae (yew).
According to NPPO (2008) the primary hosts of *A. chinensis* are: lime *Citrus aurantiifolia*, sour orange *C. aurantium*, mandarin lime *C. limonia*, pummelo *C. maxima*, tangerine *C. nobilis*, and navel orange *C. sinensis*
The range of host plants appears to be even wider in *A. chinensis* than in the Asian longhorn *A. glabripennis* (Herald *et al* 2006). Other hosts include (NPPO 2008; Lingafelter and Hoebeke 2002, in NAFC 2001): apple *Malus pumila*, Australian pine or beefwood-tree *Casuarina equisetifolia* and *Casuarina stricta*, cherry *Prunus* spp. , China-berry or Indian lilac *Melia azedarach*, Chinese pear leaved crabapple *Malus spectabilis*, fig *Ficus* spp. , guava *Psidium guajava*, hibiscus *Hibiscus* spp., Japanese red cedar *Cryptomeria japonica*, jujube *Ziziphus jujube*, litchi *Litchi sinensis*, oval kumquat *Fortunella margarita*, paper mulberry *Broussonetia papyrifera*, Persian walnut *Juglans regia*, peach *Prunus persica*, pecan *Carya illinoinensis*, pear *Pyrus communis*, pigeon pea *Cajanus cajan*, plum *Prunus* spp., poplar or aspen *Populus* spp., sycamore or plane tree *Platanus* spp., tea *Camellia sinenesis*, white mulberry *Morus alba*, and willow *Salix* sp.

General Impacts
The genera *Anoplophora* consists of xylophagous wood-boring bark and longhorned beetles which bore through and damage the xylem vessels of woody plants (xylem transports water and minerals throughout the tree). *Anoplophora* mainly infests weakened, dying or dead trees but, unlike many other borer pests, the citrus longhorn may also attack healthy trees (Chambers 2002, in Gyeltshen and Hodges 2005; Forest Research Institute 2007). Please see NUTRITION subheading on this page for a list of host plants.
The citrus longhorn damages different parts of the plant during different stages of the life-cycle. Adults feed on the tender bark of small twigs and branches and sometimes on the leaf petioles (stalks); this causes young shoots and branches to die (Maspero *et al*. Undated; Jucker *et al* 2006; EPPO 2007). The female chews through the bark of the host tree to the cambial layer, forming 'egg scars' (Lingafelter & Hoebeke, 2002, in Maspero *et al*. Undated). The larvae feed and develop in the wood of the main roots and trunks, within which they excavate tunnels; when larval density is high, infested trees can die or fall down. (Maspero et al. Undated). Damage by larvae and beetle stages leaves the tree vulnerable to secondary pests and diseases; for example, fungi and other insects produce secondary infections or infestations in the exit holes and larval galleries (EPPO 2007).
Impacts in native range: *A. chinensis* originates from Eastern Asia and is a serious pest of citrus and other ornamental and forest species in Japan, Korea and China (Adachi 1994, in Delvare *et al*. 2004; Jucker *et al*. 2006; NPPO 2008). In lowland China the species is one of the most destructive cerambycid pests of fruit orchards, especially citrus; economic losses are substantial (NPPO 2008). The citrus longhorn causes serious damages to many deciduous trees in the genera *Populus*, *Acer* and *Salix* in Eastern Asia (Delvare *et al*. 2004). It also attacks *Aesculus hippocastanum*, and species of *Betulus*, *Fraxinus*, *Morus*, *Pyrus* and *Robinia*.
Impacts in alien range: In its introduced range in Europe *A. chinensis* poses an economic and ecological threat to horticulture, forestry and woodland trees in the UK and to citrus production in the Mediterranean (DEFRA 2008).
In the United States the citrus longhorn has the potential to become a significant pest of forests and native forest ecosystems (NPPO 2008). The citrus longhorn beetle has been given a relative Risk Rating of "Very High Risk" by the North American Forest Commission and its broad host range suggests that it would easily adapt to trees indigenous to North America (NAFC 2001). This insect has been recorded on a wide variety of fruit and nut trees including pecan, *Carya illinoensis*, and possibly other *Carya* spp., *Juglans* spp. (walnut) and other nut producing trees (NAFC 2001). By reducing the numbers of nut-producing trees the citrus longhorn may have a significant and negative impact on the ecosystem, in particular on fauna that depend on these mast-producing trees (NAFC 2001). The impact on fruit and nut trees also poses a significant concern to these agricultural industries (NAFC 2001).
Costs of eradication: Between 1996 and 2001, control of a related species - the Asian longhorn beetle - cost the United States over five million dollars (NAFC 2001). Eradication costs for the citrus longhorn and the overall potential impact on the citrus and other agricultural sectors translate to similar if not greater costs.

Management Info
Please follow this link for detailed information on the control and management of *Anoplophora chinensis*

Pathway
The insect could be transported in wood products including logs, lumber, wooden packing materials, pallets or dunnage (NAFC 2001).High risk goods associated with the transfer of insect pests include consignments of stones, cast iron or electronic goods imported from Asia (Krehan 2002).International trade in nursery stock is considered a high risk pathway for the spread of plant pests (Forest Research Institute 2007). Regulated plants in the European Community under recent (2008) emergency directives include: *Acer* spp., *Aesculus hippocastanum*, *Alnus* spp., *Betula* spp., *Carpinus* spp., *Citrus* spp., *Corylus* spp., *Cotoneaster* spp., *Fagus* spp., *Lagerstroemia* spp., *Malus* spp., *Platanus* spp., *Populus* spp., *Prunus* spp., *Pyrus* spp., *Salix* spp., and *Ulmus* spp. All consignments carrying these plant species are high-risk in terms of their potential for carrying *A. chinensis* individuals or infestations (Commission Of The European Communities 2008).The larvae may move in felled timber and in nursery stock. In bonsai, they are more often found in field-collected plants than those grown under supervised nursery conditions (NPPO 2008).The insect could be transported in wood products including logs, lumber, wooden packing materials, pallets or dunnage (NAFC 2001).

Principal source:

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ALIEN RANGE

[1] EUROPE
[2] FRANCE
[1] GERMANY
[2] ITALY
[1] NETHERLANDS
[1] UNITED KINGDOM
[3] UNITED STATES

BIBLIOGRAPHY

34 references found for **Anoplophora chinensis**

Managment information

Cocquempot, Christian., 2006. Alien longhorned beetles (Coleoptera Cerambycidae): Original interceptions and introductions in Europe, mainly in France, and notes about recently imported species. Redia. 89 2006. 35-50.

Summary: Abstract: Interceptions of eighteen species of longhorned beetles in Europe, mainly in France, are reported and information about their origin, biology, host plants, potential damage, and economical impact are given. Notes about the updated situation of the most recently imported pest species are presented.

Cocquempot, Christian; Prost, Monique; Carmignac, David., 2003. Interceptions and introductions to France of Asian longhorn beetles: Case of *Anoplophora glabripennis* (Motschulsky) and *A. chinensis* (Forster) (Coleoptera Cerambycidae). Bulletin Mensuel de la Societe Linneenne de Lyon. 72(8). Octobre 2003. 273-278.

Summary: Abstract: Interceptions and introductions to France of cerambycid beetles have been increasing for some years. Two species of the Asian genus *Anoplophora* have been found recently in Ain, Ardeche, Loiret and Marne. *A. chinensis* has been accidentally imported with bonsai trees, and one introduction has hitherto been detected. *A. glabripennis* was introduced into Gien (Loiret) where success in its eradication is not guaranteed. *A. glabripennis* and *A. chinensis* were predicted to appear in France following their introduction into Austria and Italy. These are designated quarantine species under strict law, since they are formidable pests of healthy trees and bushes in their countries of origin. Their continued establishment in France is not assured, but the uncertainty of the eradication programme and overlooked introductions make their likely continued presence in the short-term irreversible. The genus *Anoplophora* contains 36 species, some of which can be confused with *glabripennis* and *chinensis*, themselves difficult to separate without careful examination. At least two other species could be imported and acclimatise to conditions in France.

Commission Of The European Communities., 2008. Draft Comission Decision of on emergency measures to prevent the introduction into and the spread within the Community of *Anoplophora chinensis* (Forster)

Summary: Available from: http://members.wto.org/crnattachments/2008/sps/EEC/08_3220_00_e.pdf [Accessed 13 November 2008]

Delvare, G�rard , Marie-Claude Bon, Franck Herard, Christian Cocquempot, Matteo Maspero & Mario Colombo. 2004. Description of *Aprostocetus anoplophorae* n. sp. (Hymenoptera: Eulophidae), a new egg parasitoid of the invasive pest *Anoplophora chinensis* (F�rster) (Coleoptera : Cerambycidae). *Ann. Soc. entomol. Fr.* (n.s.), 2004, 40 (3-4) : 227-233.

Department for Environment Food and Rural Affairs (DEFRA)., 2008. Citrus longhorn beetle (*Anoplophora chinensis*): Please look out for this pest

Summary: Available from: http://www.defra.gov.uk/planth/citruslonghorn.htm [Accessed 14 November 2008]

European and Mediterranean Plant Protection Organization (EPPO) 2006. Distribution of Quarantine Pests of Europe : *Anoplophora chinensis*

European and Mediterranean Plant Protection Organization (EPPO), 2007. *Anoplophora chinensis* - Eradication programme in Lombardia (Italy) Prepared for EPPO by Matteo Maspero, Guglielmo Cavaliera, Giovanni D�Angelo, Costanza Jucker, Marta Valentini, Mario Colombo, Franck Herard, Jaime Lopez, Nathalie Ramualde, Mariangela Ciampitti, Gualtiero Caremi and Beniamino Cavagna (updated in September 2007)

Summary: Available from: http://www.eppo.org/QUARANTINE/anoplophora_chinensis/chinensis_IT_2007.htm [Accessed 13 November 2008]

European and Mediterranean Plant Protection Organization (EPPO), undated. Data Sheets on Quarantine Pests *Anoplophora malasiaca* and *Anoplophora chinensis*. Prepared by CABI and EPPO for the EU under Contract 90/399003

Summary: Available from: http://www.eppo.org/QUARANTINE/insects/Anoplophora_malasiaca/ANOLMA_ds.pdf [Accessed 13 November 2008]

Florida Department of Agriculture Consumer Services, Division of Plant Industry., 2004. Pest Alert: A second Asian Longhorned Beetle in the U.S

Summary: Available from: http://www.doacs.state.fl.us/pi/enpp/ento/clbalert.html [Accessed 13 November 2008]

Forest Research Institute. 2007. Alien Invasive Species and International Trade. Forest Research Institute: Warsaw.

Gyeltshen, Jamba and Amanda Hodges, 2005. Featured Creatures: common name: citrus longhorned beetle scientific name: *Anoplophora chinensis* (Forster) (Insecta: Coleoptera: Cerambycidae). Florida Department of Agriculture and Consumer Services, Division of Plant Industry and University of Florida
Summary: Available from: http://creatures.ifas.ufl.edu/trees/beetles/citrus_longhorned_beetle.htm [Accessed 13 November 2008]
H�rard, F.; Ciampitti, M.; Maspero, M.; Krehan, H.; Benker, U.; Boegel, C.; Schrage, R.; Bouhot-Delduc, L.; Bialooki, P., 2006. *Anoplophora* species in Europe: infestations and management processes1 (p 470-474)
H�rard, Franck., Marie-Claude Bon., Matteo Maspero., Christian Cocquempot and Jaime Lopez., 2005. Survey and Evaluation of Potential Natural Enemies of *Anoplophora glabripennis* and *A. chinensis*. Proceedings, 16th U.S. Department of Agriculture interagency research forum on gypsy moth and other invasive species 2005 GTR-NE-337
Summary: Available from: http://www.fs.fed.us/ne/newtown_square/publications/technical_reports/pdfs/2005/337papers/herard337.pdf [Accessed 13 November 2008]
International Plant Protection Convention (IPPC)., 2008. Official Pest report 28 January 2008. *Anoplophora chinensis* on *Acer* spp. in public green and companies
Summary: Available from: https://www.ippc.int/servlet/CDSServlet?status=ND1ucHBvbmwuMTkzMTA0JjY9ZW4mMzM9cGVzdF9yZXBvcnQmMzc9aW5mbw~~ [Accessed 13 November 2008]
Jucker, Costanza, Maspero, Matteo, Colombo, Mario, Valentini, Marta, Herard ,Franck, Lopez, Jaime, Cocquempot, Christian, Delvare, Gerard, Cavalieri, Guglielmo, D Angelo, Giovanni, 2006. Biological Notes on *Anoplophora chinensis* and Control Techniques in Italy. Work published with a grant of Lombardia Region (Italy) Research Project �Biology, ethology and control of *Anoplophora chinensis* Forster - BETOTAC� financed in the plan for research and development 2004-2006.
Summary: Available from: http://www.agricoltura.regione.lombardia.it/admin/rla_Documenti/1-3502/poster_smirne.pdf [Accessed 13 November 2008]
Kimoto, Troy and Marnie Duthie-Holt., 2006. Exotic Forest Insect Guidebook. Canadian Food Inspection Agency. English language version
Summary: Available from: http://www.inspection.gc.ca/english/plaveg/pestrava/exot/introe.pdf [Accessed 13 November 2008]
Kimoto, Troy, Marnie Duthie-Holt & Louise Dumouchel., 2006. Guide des insectes forestiers exotiques. Agence canadienne d�inspection des aliments. French language version
Summary: Available from: http://www.doacs.state.fl.us/pi/enpp/ento/clbalert.html [Accessed 13 November 2008]
Krehan, Hannes. 2002. Asian Longhorned Beetle in Austria: Critical Comments on Phytosanitary Measures and Regulations. In: Proceedings U.S. Department of Agriculture Interagency Research Forum on Gypsy Moth and Other Invasive Species January 15-18, 2002. United States Department of Agriculture Forest Service.
Lance, David R.,2002. *Anoplophora chinensis* Introduction in Tukwila, Washington In Proceedings: 2002 U.S. Department of Agriculture Interagency Research Forum GTR-NE-300
Summary: Available from: http://www.fs.fed.us/ne/newtown_square/publications/technical_reports/pdfs/2003/gtrne300.pdf#page=65 [Accessed 14 November 2008]
Maspero, M, C Jucker, M Colombo, M Ciampitti, B Cavagna and G Caremi. Undated. The longhorn beetle *Anoplophora chinensis* (form *malasiaca*), a new pest of woody ornamentals in Italy.
Ministry for resources and Rural Affairs (Malta)., undated. Press release about the possibility of introduction of the Citrus Longhorn Beetle (*Anoplophora chinensis*) in the Maltese Islands.
Summary: Available from: http://www.planthealth.gov.mt/Downloads/anoplophora_chinensis_eng.pdf [Accessed 13 November 2008]
Ministry of Agriculture and Forestry (MAF). 2005. Media Release: Top eight pests to watch.
Summary: Available from: http://www.maf.govt.nz/mafnet/press/100605pests-top8.htm [Accessed 14 November 2008]
National Agricultural Pest Information System (NAPIS)., 2008. Pest Tracker: Reported Status of Citrus Longhorned Beetle *Anoplophora chinensis*
Summary: Available from: http://pest.ceris.purdue.edu/searchmap.php?selectName=INALRBA [Accessed 13 November 2008]
Netherlands Plant Protection Service., 2008. Pest Report: *Anoplophora chinensis* on *Acer* spp. in public green and companies
Summary: Available from: http://www.minlnv.nl/portal/page?_pageid=116,1640321&_dad=portal&_schema=PORTAL&p_file_id=24663 [Accessed 13 November 2008]
North American Plant Protection Organization (NAPPO), Phytosanitary Alert System! 2008. *Anoplophora chinensis* (Forster, 1771) Citrus longhorned beetle discovered in two Washington State nurseries (USA)
Summary: Available from: http://www.pestalert.org/viewArchPestAlert.cfm?rid=72 [Accessed 13 November 2008]
Office Of Public Sector Information (OPSI)., 2008. Statutory Instruments 2008 No. 2765 Plant Health, England. The Plant Health (England) (Amendment) (No. 2) Order 2008
Summary: Available from: http://www.opsi.gov.uk/si/si2008/uksi_20082765_en_1 [Accessed 13 November 2008]
Office of the Queen s Printer for Scotland (OQPS)., 2008. Scottish Statutory Instruments. 2008 No. 350 PLANT HEALTH The Plant Health (Scotland) Amendment (No. 2) Order 2008
Summary: Available from: http://www.oqps.gov.uk/legislation/ssi/ssi2008/ssi_20080350_en_1 [Accessed 13 November 2008]
The Nature Conservancy. 2004. Gallery of Pests: Pests & pathogens that have not yet arrived or have been eradicated Citrus Longhorned Beetle - *Anoplophora chinensis* Forster
Summary: Available from: http://tncinvasives.ucdavis.edu/products/gallery/anoch1.html [Accessed 14 November 2008]
The North American Forest Commission Exotic Forest Pest Information System (NAFC-ExFor). 2001. Pest Reports ExFor Database
Walker, K. 2008. Citrus longhorned beetle (*Anoplophora chinensis*) Pest and Diseases Image Library. Updated on 5/7/2008 1:11:13 PM.
Summary: Available from: http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=268 [Accessed 13 November 2008]
World Trade Organization (WTO)., 2008. Committee on Sanitary and Phytosanitary Measures: Notification of Emergency Measures G/SPS/N/EEC/334
Summary: Available from: http://www.minlnv.nl/cdlpub/servlet/CDLServlet?p_file_id=31089 [Accessed 13 November 2008]

Xu, Qi., 1997. Habits of *Anoplophora chinensis* which causes harm to *Casuarina equisetifolia* and its control. Forest Research. 10(5). Oct., 1997. 551-555.
Summary: Abstract: In 1989-1992, the research results showed that *Anoplophora chinensis* has one generation a year, but in the whole, about 15% of them has two generations in three years. its damage degree is obviously correlated with the plant age, stand density and stand condition. The total accumulated temperature of 1200 C was needed in the period when after overwintering,the larva after recovering is changed into adults. Its emergence peak day(time) was obviously coincided with in full bloom day (time) of *Casuarina equiselifolia* in the stand. Through the investigation of 8263 sample trees and about one hundred thousand plants checked, a chance of 100% can be reached of its emergence hole distributed in 25 cm above the ovipositing slot. A mortality above 90% can be reached by daubing trunks at above the egg hole about at 25 cm with 40% omethoate in 1:4 time solution of kerosine and the technical points in the synthetical control were suggested.

General information

CABI Crop Protection Compendium., 2007. *Anoplophora chinensis*
Summary: Synonyms and common names
Available from: http://www.cabicompendium.org/NamesLists/CPC/Full/ANOLCH.htm [Accessed 13 November 2008]
Invasive.org., 2008. Citrus long-horned beetle Coleoptera > Cerambycidae > *Anoplophora chinensis* (Forster)
Summary: Available from: http://www.invasive.org/browse/subject.cfm?sub=4014 [Accessed 13 November 2008]