Anoplophora glabripennis

Introduction

The Asian Longhorned Beetle (ALB), *Anoplophora glabripennis* is a recent introduction to the United States. It was first discovered in Brooklyn, New York in 1996 It originated in China and is a serious threat to hardwood trees. There are several known natural enemies in the US. The beetle, should it be introduced to the Caribbean has the potential to cause severe damage to the hard wood industry.

Identity

Authority : Motschulsky
Classification
- Kingdom : Animalia
- Phylum : Arthropoda
- Class : Insecta
- Order : Coleoptera
- Family : Cerambycidae
- Genus : *Anoplophora*
- Species : *glabripennis*
- Common names : Asian Longhorned Beetle, Asian long-horn beetle, basicosta white-spotted longicorn beetle, starry sky beetle.
- Role : Pest

Signs & Symptoms

The ALB attacks many different hardwood trees. When attacked, leaves have abnormal colours and there is also abnormal leaf fell. When beetles leave the tree large round holes (1.3cm) are seen on the branches, trunk or roots. Frass is also seen near the exit holes or at the base of the tree.

Morphology

ECOPORT (1999)

Fig. 1: Adult Asian longhorned beetle

The Asian Longhorned Beetles are large, conspicuous insects readily recognized by their horns or antennae (Fig. 1).

Adult: Adults are 20 - 35 mm in length and 7 - 12 mm in width with a shiny jet-black colour. The antennae have 11 segments. The bases of the antennae are whitish with a blue-black colour. The antennae of the males are 2.5 times their body length; the antennae of the female is 1.3 times the body length. The base of the elytra do not have a granular structure. Each elytron has about 20 white dots (Peng & Liu, 1992).

Egg: The off-white, oblong eggs are 5 - 7 mm in length. Both ends of the eggs are slightly concave (Peng & Liu, 1992).

Larva: Mature larvae are 50 mm in length. The prothorax has a brown mark. The front of the mark does not have a brown margin (Peng & Liu, 1992).

Pupa: The off-white pupa is 30 – 33 mm in length with a width of 11 mm. The eighth segment of the abdomen has a protruding structure (Peng & Liu, 1992).(Fig 2)

Fig. 2: Pupal stage of ALB

Biology & Ecology

The female Asian Longhorned Beetle lays eggs in depressions in the bark of the trees.
A female can lay 35 - 90 eggs, which hatch in 10 - 15 days. The larvae tunnel under the tree bark and bore into healthy hardwood. They also feed on living tree tissue during fall and winter. After pupation, adults emerge in the spring through exit-holes. Adult beetles feed for 2-3 days on the bark of the tree before mating. Adults are active only during summer and early fall in the USA before completing their life cycle, which takes about a year.

The leaves and stems of plants are attacked including the vegetative growing stage, flowering and fruiting stages. After maturing these beetles, leave round exit-holes just larger than the diameter of a pencil. Exit-holes may ooze sap and deposits of frass may be seen below these holes. Trees can die if the transport pathways are severely disrupted by feeding larvae.

Dispersal / vectors

The spread is facilitated by transporting ALB in solid wood packing materials, infested trees and branches to non-infested areas.

Management

ALB spends the vast majority of its life cycle within the host tree and this makes it difficult to kill after the host tree is attacked

Cultural Control

Cultural control methods such as cut/chip/burning infested trees and replacing with non-host species can be effective.

Chemical Control

The insecticide Imidacloprid is injected into infested trees to control larval development.. Research is continuing on other management options. These include – Heat treatment, Fumigation with Methyl Bromide.

Natural Enemies

There are many natural enemies attacking ALB. These include predators, parasitoids and pathogens. There are several beetles that prey on ALB. Parasitoids include braconids, ichneumonids and chalcids. Pathogens include - *Bacillus thuringiensis,Beauveria, Metarhizium*

Host Notes

Primary hosts include *Acer* (maple), *Acer negundo* (Boxelder), *Aesculus hippocastanum* (buckeye), *Populus* (poplars), *Salix matsudana* (Peking willow), *Salix* (willow), *Ulmus* (elms) and *Robinia pseudoacacia* (locust tree).
Michael Smith, Entomologist with USDA reports that ALB can tolerate extremes of temperature – cold winters and hot summers. This is an indication that the pest can survive in the Caribbean should it be introduced to these parts.

Distribution

CABI/EPPO (1991)

It is present in China, Japan, North Korea and South Korea. In the Western Hemisphere it has a restricted distribution in New York and Illinois in the United States (CABI/EPPO, 1999).
It has been intercepted in Canada but reportedly not present (CABI/EPPO, 1999).

Pest Significance & Phytosanitary Risk

If established, the Asian Longhorned Beetle can cause significant damage to forest trees.
It has the potential to cause more damage than Dutch elm disease, chestnut blight and gypsy moth all together. It can therefore destroy millions of acres of hardwood forest and backyard trees. Industries such as lumber, tourism, nursery and commercial fruit can be affected causing immense losses.
The species is of quarantine importance and should be kept out of locations where it is not yet present.

Inspection Procedures

Visual inspections of high-risk cargoes in distribution warehouses must be conducted especially with goods coming from high-risk areas.
The coordination of different agencies for detection and prompt reporting to the relevant authorities can assist in timely eradication of the pest.

BIBLIOGRAPHY

CABI Crop Protection Compendium, (2001).

CABI/EPPO, (1999). *Distribution Maps of Plant Pests. Map* **No. 590.** Wallingford. UK. *CAB International.*

Smith, M. T. (1999). The Pontential for Biological Control of Asian Longhorned Beetle in the US. Midwest Biocontrol News online.

USDA, ARS, Methyl Bromide Newsletter 6(2)(2000). From East to West: The Asian Longhorned Beetle has arrived

WEB RESOURCES -

http://www.aphis.usda.gov/oa/alb/alb.html
http://www.entomology.wisc.edu/mbcn/fea606.html