Asian Longhorned Beetle and Look-alike beetles

Sharpening Your Observation Skills
Objectives

• To learn how to recognize symptoms commonly caused by wood borers
• To learn how to recognize and identify signs of cerambycid beetles
• To learn how to recognize the Asian longhorned beetle (ALB) and distinguish it from similar native species
Impact of invasive wood borers

- Invasive pest introductions cost the US over $2 billion annually
- Significant economic and ecological impacts to North American forests
  - The emerald ash borer (Buprestidae) threatens the $280 billion ash industry
  - The Asian longhorned beetle (Cerambycidae) is responsible for ~$669 billion in urban resource losses
Introduction to wood borers

- Primary vs secondary invaders
- Insect orders
- Xylem/phloem feeders
- Host specificity

Photo: © Dennis Haugen, USDA Forest Service, Bugwood.org
Primary vs secondary invaders

• **Primary invaders**—are pests that attack healthy trees. Trees can withstand minor damage from primary invaders.

• **Secondary invaders**—are pests that attack trees that are already stressed. Secondary invaders contribute to the decline and mortality of stressed trees.
Wood boring insect orders

Beetles—Buprestidae (flatheaded borers)

Beetles—Cerambycidae (roundheaded borers)

Moths—clearwing moths & carpenterworms

Wasps—horntail wasps

Photos: clockwise from top left © D. Cappaert, MSU, Bugwood.org; USDA-beetle busters; Pest and Diseases Image Library, Bugwood.org; J. Berger, Bugwood.org
Phloem feeder or xylem feeder
Phloem feeder or xylem feeder

examples include EAB and bronze birch borer

examples include ALB and clearwing moths

Photos: (left) EAB galleries © Dan Herms, the Ohio State University and (right) ALB damage © E. Richard Hoebeke, Cornell University, Bugwood.org
Host specificity

EAB—host specific

Redheaded ash borer—generalist

Bronze birch borer—host specific

ALB—generalist
Symptoms & signs of a borer infestation

- Exit holes and oviposition sites
- Sawdust/frass
- Life stages
- Wilting
- Thinning or canopy dieback
- Broken branches/wind damage
- Epicormic shoots—vigorous shoots growing from the base of the tree or from trunk
- Woodpecker damage
Symptom: thinning and dieback
Symptom: broken branches

Photos from left: © J. O'Brien, USDA-FS and T. Denholm, New Jersey Department of Agriculture, Bugwood.org
Symptom: epicormic shoots

Photos: © PDNR, Forestry Archive, Bugwood.org
Symptom: woodpecker damage

Symptom: woodpecker damage

Photos clockwise from left: © C. M. Ernst via thebuggeek.com; Kevin Freeman, USDA-APHIS; and Joe Boggs, the Ohio State University
ALB symptoms and signs

- Oviposition sites with mandible marks
- Larval frass/ sawdust buildup
- Circular, pencil diameter exit holes
- Life stages—larvae or adults
ALB—fresh oviposition sites

Photos clockwise from top left: © USDA via flickr; Dennis Haugen, US-FS, Bugwood.org; Donald Owen, CDFFP, Bugwood.org; and © Joe Boggs, OSU, Bugwood.org
ALB—aged oviposition sites

Photos top: © Kenneth R. Law, USDA APHIS PPQ, Bugwood.org; and bottom © Kevin Freeman, USDA-APHIS
ALB—larval frass and sawdust

Photos clockwise from top left: frass © Kevin Freeman, USDA-APHIS; heavily infested tree with frass and bark splitting and frass pushing out of an oviposition site © Kenneth R. Law, USDA APHIS PPQ, Bugwood.org; and sawdust and frass at the base of an infested tree © PDCNR-Forestry Archive, Bugwood.org
ALB—exit holes
Look-alike signs

Photos (left): leopard moth exit hole and (right top and bottom) squirrel chews in bark © Kevin Freeman, USDA-APHIS
Longhorned beetles

• Family Cerambycidae
• Characterized by very long antennae, oftentimes much longer than the body
• Larvae are round-headed wood borers and cause internal damage to affected hosts
Beetle identification

- Typically—two pairs of wings
- Elytra—hard forewings or wing covers, typically meet in a line down the back
- Flight wings generally not visible at rest
ALB Characteristics

- Size: 1–1 ½ in (25–35 mm) long, female larger than male
- Antennae 2.5x longer in males, and 1.3x longer in females
- Antennae appear banded
- Blotches on elytra, of differing sizes, usually white
- Elytral bases are smooth, often with a sheen
- Scutellum black
Asian longhorned beetle
(*Anoplophora glabripennis*)
Identifying ALB and other look-alike beetles
Side by side comparison

ALB

Spotted pine sawyer
(Monochemus mutator)

Distinguishing features:
• White scutellum
• Rough appearance
Side by side comparison

**ALB**

Distinguishing features:
- White scutellum
- Brown
- Rough appearance

**Northeastern pine sawyer (Monochamus notatus)**

10 mm
Side by side comparison

ALB

White spotted sawyer
(*Monochamus scutellatus*)

Distinguishing feature:
- White scutellum
ALB vs Monochamus spp.

ALB

Monochamus scutellatus
Side by side comparison

**ALB**

**Banded alder borer**
(*Rosalia funebris*)

**Distinguishing features:**
- Well defined white bands
- Black spot on thorax
Side by side comparison

ALB

Cottonwood borer
(Plectrodera scalator)

Distinguishing feature:
• Dorsum of thorax with one large black blotch surrounded by off-white
Side by side comparison

ALB

Distinguishing features:
- Leathery elytra, devoid of markings

Broad-necked root borer
( Prionus laticollis )

10 mm
Side by side comparison

ALB

Distinguishing features:
• Two eyespots on relatively elongated thorax
• Short antennae

Eyed click beetle
(Alaus oculatus)
Side by side comparison

ALB

Western conifer seedbug
(*Leptoglossus occidentalis*)

Distinguishing features:
- Not a beetle
- “X” shape formed by folded wings

Photo © Giancarlodessi via Wikimedia Commons
Citrus longhorned beetle (CLB)  
(Anoplophora chinensis)

- Size 1–1 ½ inches (25–40 mm) long
- Polyphagous pest
- Preference for hardwoods
- April-August
ALB vs CLB: distinguishing feature
Review diagnostic features

• The Asian and citrus longhorned beetles are shiny, black **beetles**
  – with white splotches
  – a black scutellum
  – white and black banded antennae

• Insects which are not beetles can be eliminated as potential suspects!
Review the signs and symptoms

Photos: USDA-APHIS, BeetleBusters via flickr
Check the depth of exit holes
Supporting materials

Visit www.FirstDetector.org for materials to supplement this presentation including posters, diagnostic photo guides and promotional materials.
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Sources

- Buckeye Yard & Garden onLine. April 2013. All borers are not created equal! The Ohio State University Extension. (http://bygl.osu.edu/content/april-25-2013)
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