

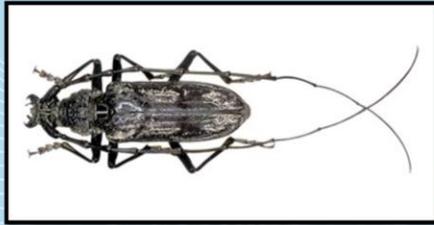
Mountain Oak Longhorned Beetle

Massicus raddei



Mountain Oak Longhorned Beetle

- Other common names: deep mountain longhorn beetle, oak longhorned beetle.
- Native to some parts of Asia.
- Polyphagous pest of forests and deciduous trees.



Some other common names for the mountain oak longhorned beetle include the deep mountain longhorn beetle and the oak longhorned beetle. This pest is a polyphagous pest of forests and deciduous trees in central Asia.

Information sources: 3, 4, 5, 6

Global Distribution of the



Image credits: map created with easymapmakers.com, Background image: NASA, Terrametrics 2016



The mountain oak longhorned beetle only occurs in Asia including China, Japan, Korea, Taiwan, Vietnam, and Russia. It has recently received attention due to the risk that it will spread to other parts of the globe. *Massicus raddei* has not yet been detected in the United States. Furthermore, no species of the genus *Massicus* is known to occur in the United State.

Information sources: 3, 4

Pest of Oaks and Chestnuts



Image credits: bur oak (*Quercus macrocarpa*) Michx. - Jason Sherman, Vivaltree - Bugwood.org, 5454705; chestnut oak (*Quercus prinus*) L. - Chris Evans, University of Illinois - Bugwood.org, 1380024; American chestnut (*Castanea dentata*) (Marsh.) Borkh. - Joseph O'Brien, USDA Forest Service - Bugwood.org, 5298004



protect.us.

community. invasive species network

First Detectors Protecting U.S. from Pests

The mountain oak longhorned beetle is a major pest of oaks and chestnuts in Asia but it has been noted on some other hosts. The beetle larvae were most often found in trees with trunks larger than 9cm in diameter. Most literature suggests that's the larvae target mature hosts and rarely attack younger trees.

Primary hosts:

oaks (*Quercus*),

chestnuts (*Castanea*)

Other Hosts:

Castanopsis cuspidata,

Castanopsis cuspidata var. *sieboldii*,

Morus sp.,

Paulownia sp.

Information sources: 4

Damage



Larval galleries



Crown dieback



Image credits: twolined chestnut borer (*Agrilus bilineatus*) (Weber, 1801) - Steven Katovich, USDA Forest Service - Bugwood.org, #5525727; crown decline - Joseph OBrien, USDA Forest Service - Bugwood.org, 5046027; dieback - Joseph OBrien, USDA Forest Service - Bugwood.org, #5252088



protect us.

community. invasive species network

First Detectives Protecting U.S. from Pests

The major damage to the tree results from larvae feeding on the phloem. The mountain oak longhorned beetle larva create galleries in plant tissues. Adults will also feed on the sap flowing from the wounds they inflict on the branches. As a result, the trees can experience crown dieback. According to the literature, it is unsure whether or not this will cause eventual tree death. Nonetheless, it will make the host more susceptible to secondary pests. Furthermore, the pest is not known to transmit diseases between hosts.

Information Sources: 3, 4

Identification

- Adults
 - 3-5cm in length
 - Brown
- Larvae
 - Up to 8cm
 - White



Image credits: deep mountain longhorn beetle (Neocerambyx rodde) Blessig & Solsky, 1872 - Bob Parks, Screening Aids, USDA APHIS ITP - Bugwood.org, #5540895; deep mountain longhorn beetle (Neocerambyx rodde) Blessig & Solsky, 1872 - Joseph Benzel, Screening Aids, USDA APHIS ITP - Bugwood.org, 5540897



protect u.s.

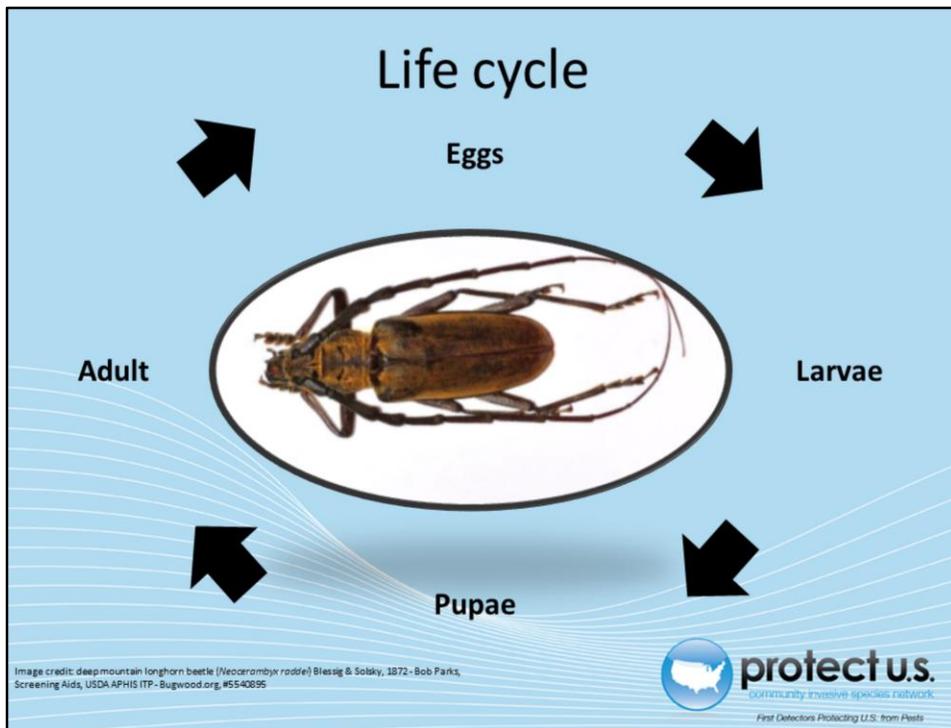
community invasive species network

First Detectors Protecting U.S. from Pests

Adults are 3-5cm in length which is larger on average than most other longhorned beetles. The antennae are much longer than the body.

Larvae are whitish in color and can grow up to 8cm in length.

Information sources: 3, 4, 5



Studies in China have concluded that the mountain oak longhorned beetle completes one generation every three years. Adults will emerge in mid-July to late August and can live up to 20 days. In September, the larvae will complete 6 instars in a period of no more than 1021 days. Larvae will overwinter during the first year as 2nd or 3rd instars, the second year as 4th and 5th instars, and the third year as 6th instars.

Information sources: 3, 5

Control

- Phytosanitary measures
 - Monitoring nurseries
 - Cutting and burning infested trees
 - Debarking wood before movement
- Biological control
 - *Dastarcus helophoroides*
 - *Sclerodermus pupariae*



Image credits: visual tree inspection - Andrew Koesser, International Society of Arboriculture, - Bugwood.org, #5375292



Most controls is cultural involve phytosanitary measures. This includes monitoring nurseries and trees frequently and cutting and burning extremely infested trees. Any wood from an infested host should be burned. If wood is to be moved, it should be inspected by debarking ahead of time. International movement of untreated wood could lead to he spread of the pest to more areas of the world.

As far as biological control, *Dastarcus helophoroides* is a known parasitoid of the mountain oak longhorned beetle later instar larvae in China. Also, *Sclerodermus pupariae* was also noted in several studies as a parasitoid for the younger larvae of this pest.

Information Sources: 1, 2, 5

Suspect Sample Submissions

- Contact your State Department of Agriculture or University Cooperative Extension laboratory
 - <http://www.npdn.org/home>
- PPQ form 391, Specimens for Determination
 - https://www.aphis.usda.gov/library/forms/pdf/PPQ_Form_391.pdf

The image shows a detailed form titled 'PPQ Form 391, Specimens for Determination'. It is a multi-section document with various checkboxes and text entry fields. Key sections include:

- SECTION 1: SPECIMENS FOR DETERMINATION** - Fields for collector name, date, and location.
- SECTION 2: REASON FOR IDENTIFICATION** - Multiple choice options for why the sample is being submitted.
- SECTION 3: IDENTIFICATION INFORMATION** - Fields for the name of the pest and the quantity of the sample.
- SECTION 4: SUBMITTER INFORMATION** - Fields for the submitter's name, address, and contact information.
- SECTION 5: SUBMISSION INFORMATION** - Fields for the submission date, time of day, and method of transport.
- SECTION 6: DETERMINATION** - A section for the laboratory to provide their findings, including pest identification and any recommendations.

An example of a PPQ form for sample submissions

Image credits: https://www.aphis.usda.gov/library/forms/pdf/PPQ_Form_391.pdf



If a suspect pest has been located in the United States, a sample should be submitted for proper identification. Contact your local diagnostic lab to ship in a sample for identification. Information regarding your local diagnostic lab is available at National Plant Diagnostic Network (NPDN) website. The diagnostic lab information and available contacts are divided by state.

<http://www.npdn.org/home>

The sample specimen should be submitted along with accompanying documentation using the PPQ form 391.

https://www.aphis.usda.gov/library/forms/pdf/PPQ_Form_391.pdf

Your local diagnostic lab is part of your local cooperative extension service or your state department of agriculture. Your local lab will also have a specific form. All local labs may not be a member of NPDN. However, all labs should report new pest and pathogen detections to local regulatory officials.

Communications



- Contact your State Plant Health Director
 - https://www.aphis.usda.gov/aphis/ourfocus/planthealth/ppq-program-overview/ct_sphd



- Contact your State Plant Regulatory Official
 - <http://nationalplantboard.org/membership/>

image credits: <http://www.usda.gov/wps/portal/usda/usdahome>; <http://nationalplantboard.org/>



Remember that new pest and pathogen records must be reported to your State Plant Health Director (SPHD) and your State Plant Regulatory Official (SPRO). The SPRO is a State Department of Agriculture Employee and the SPHD is a USDA-APHIS-PPQ employee.

The link to your SPRO is on the National Plant Board (NPB) website. It has an interactive map and when you click on your state it will take you to another page with contact information. The NPB is a cooperative organization that includes membership from all State Departments of Agriculture.

Author and Publication Dates

- **Morgan Pinkerton**
 - Laboratory Technician, Department of Entomology and Nematology, University of Florida
 - **Amanda Hodges, Ph.D.**
 - Associate Extension Scientist, Department of Entomology and Nematology, University of Florida
- Publication date: October 2016



Reviewers

- Catherine A. Marzolf
 - Assistant State Plant Health Director, USDA APHIS PPQ



Educational Disclaimer and Citation

- This presentation can be used for educational purposes for NON-PROFIT workshops, trainings, etc.
- Citation: Pinkerton, Morgan and Amanda Hodges. 2016. Mountain oak longhorned beetle – *Massicus raddei*.

Accessed (add the date)

www.protectingsnow.org



Our Partners

- United States Department of Agriculture, National Institute of Food and Agriculture (USDA NIFA)
- United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (USDA APHIS PPQ)
- Cooperative Agriculture Pest Survey (CAPS) Program
- National Plant Board (NPB)
- States Department of Agriculture
- Extension Disaster Education Network (EDEN)
- Center for Invasive Species and Ecosystem Health (Bugwood)
- National Plant Diagnostic Network (NPDN)
- U.S. Department of Homeland Security (DHS)
- U.S. Forest Service (USFS)



References

1. Anonymous. 2006. Data sheets on quarantine pests: *Aeolesthes sarta*. European and Mediterranean Plant Protection Organization. Accessed 3/4/2016.
 - http://afghanag.ucdavis.edu/a_horticulture/fruits-trees/apples/pest-management-ipm/Beetle_Aeolesthes_sarta.pdf
2. Anonymous. 2015. *Aeolesthes sarta* (city longhorn beetle). Invasive Species Compendium. Accessed 2/29/2016.
 - <http://www.cabi.org/isc/datasheet/3430>
3. Benzel, J. 2015. Screening Aid: Mountain Oak Longhorned Beetle, *Massicus raddei* (Blessig). USDA-APHIS-PPQ National Identification Services (NIS). Accessed 6/24/2016.
 - <https://caps.ceris.purdue.edu/dmm/2803>
4. OEPP/EPPO. 2015. *Massicus raddei* (Coleoptera: Cerambycidae). European and Mediterranean Plant Protection Organization. Accessed 6/24/2016.
 - https://www.eppo.int/QUARANTINE/Alert_List/insects/Massicus_raddei.htm



References

5. Wei, J. et al. 2008. (R)-(+)-limonene, Kairomone for *Dastarcus Helophoroides* , a Natural Enemy of Longhorned Beetles. *Agricultural and Forest Entomology*. 10, 323–330.
– <http://onlinelibrary.wiley.com/enhanced/doi/10.1111/j.1461-9563.2008.00384.x>
6. Yang, Z., X. Wang, and Y. Zang. 2014. Recent Advances in Biological Control of Important Native and Invasive Forest Pests in China. *Biological Control*. 68, 117–128.
– <http://www.sciencedirect.com/science/article/pii/S1049964413001291>

