Ironclad ID

Tool for Diagnosing Ironclad and Cylindrical Bark Beetles of the U.S.

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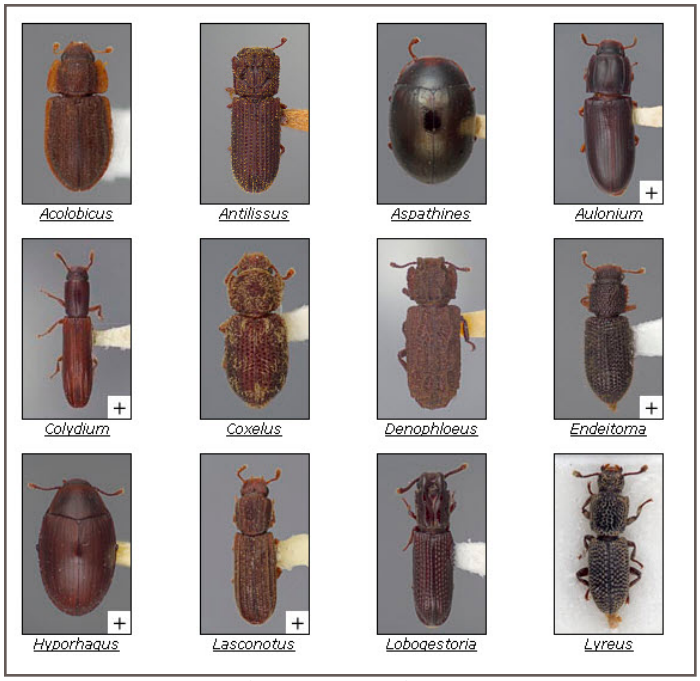
CPHST is pleased to announce the release of its newest identification tool, *Ironclad ID: Tool for Diagnosing Ironclad and Cylindrical Bark Beetles (Coleoptera: Zopheridae) of the United States*, developed through collaboration between CPHST and University of New Mexico. Designed for use by a wide variety of individuals, *Ironclad ID* aims to provide support for the identification of all genera and species in the family Zopheridae known to occur in North America north of Mexico. This cosmopolitan family currently contains 190 genera and around 1,700 species, and the group is thought to include both harmful and beneficial members. Because these beetles are subcortical by nature, foreign taxa may be fairly easily introduced and established in new areas.

The interactive key featured in *Ironclad ID* was developed in Lucid version 3.5 software. The tool was uploaded to the internet in June 2011 to support easy access by PPQ and cooperators. *Ironclad ID* can be accessed at:

itp.lucidcentral.org/id/wbb/IroncladID/

Ironclad and Cylindrical Bark Beetles are usually found under bark of dead or dying trees or in the surrounding litter. Some members are strictly found on conifers, others on hardwoods, and a number on both. Many of these beetles are cylindrical in shape and are frequently found in the holes or passages bored by other insects.

Several zopherid groups are frequently associated with particular fungi known to harm or kill valuable hardwood trees, and they may play a role in the transmission of these fungal diseases. These beetles may pose a potential hazard to lumber products. On the other hand, several genera are frequently encountered in the bored tunnels of platypodine and scolytine ambrosia beetles. These genera (and no doubt others) are thought to be predaceous as both larvae and adults on these destructive beetle pests, serving as potential biological control agents.

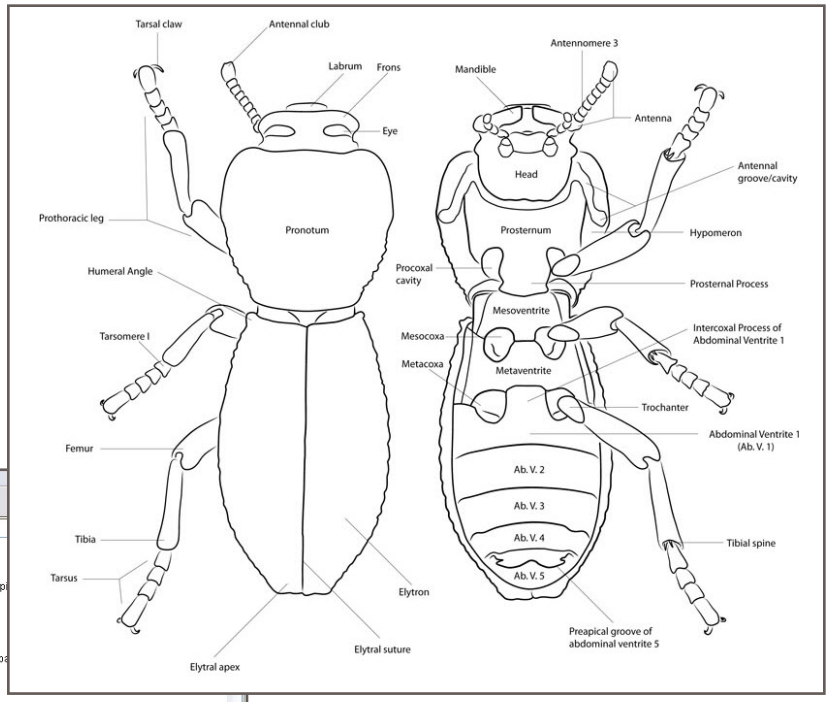


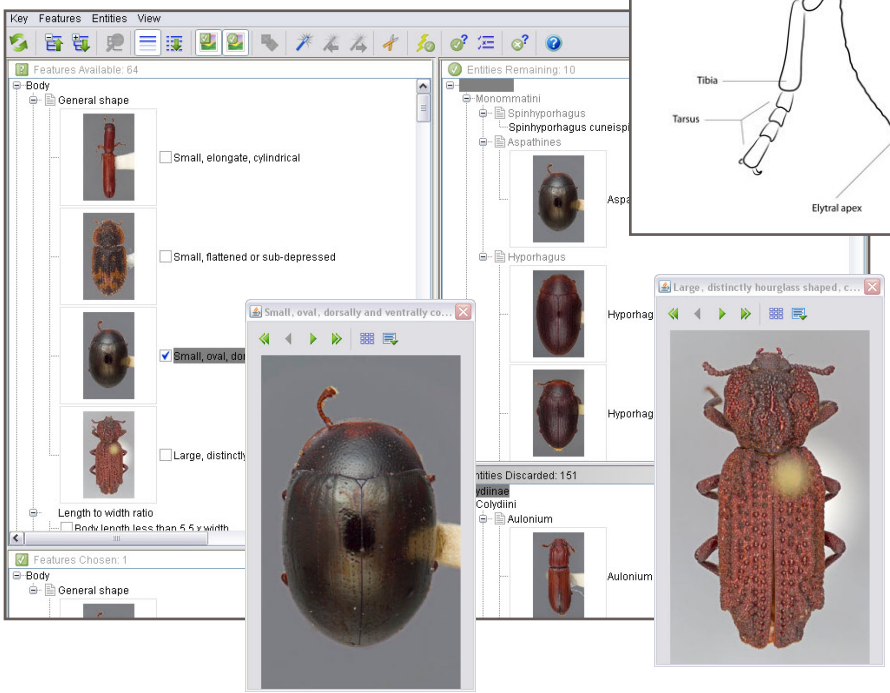
Screenshot of a portion of the gallery page

Ironclad ID is an extensively illustrated identification tool, featuring a gallery page with habitus images of representatives of each genus (see previous page), with additional "mini-galleries" for those genera with multiple species. The genus fact sheets feature detailed descriptions, diagnostic features including distinguishing characteristics for similar genera, geographic distribution, biology, and references. Each fact sheet includes species diagnoses where applicable, along with high-quality images for each species, with several of the images being of the type specimens. Also included are information on potential problems with identification and taxonomic uncertainties, as generic and tribal concepts are still in flux for this diverse group.

The tool also features a morphological atlas to help users who may not be completely familiar with all the morphological terminology featured in the tool. A glossary is provided within the tool to provide more specific definitions to terms used in the key and fact sheets. A page detailing diagnostic features for the family, as well as each of the subfamilies and tribes, is also offered, since due to the tremendous heterogeneity within zopherids, they can often be difficult to identify with any consistent set of features.

Screenshot of the morphological atlas





Screenshot of the key with two feature state images open

The matrix-based key (left) offers identification support for the 37 genera and 112 species of zopherid beetles known to occur in the United States and Canada. Many of the features are illustrated with photographs, and others are described in detail on separate pages accessible from within the key. Nearly every species in the key is represented by a habitus image to facilitate efficient identification. Larger sized images are available by clicking the thumbnails, as shown here.

The developers of *Ironclad ID* would appreciate receiving any comments about the value and usefulness of this tool and learning of any problems you encounter when accessing or using the tool. Please contact Nathan Lord (email bothriderid@gmail.com) with any comments or questions.

To learn more about Lucid software and Lucid tools, visit www.lucidcentral.org. For information concerning other CPHST-developed tools for plant protection and quarantine, contact Amanda Redford (email amanda.j.redford@aphis.usda.gov).