FIRST RECORDS OF *XYLEBORUS GLABRATUS* (COLEOPTERA: CURCULIONIDAE) IN ALABAMA AND IN HARRISON COUNTY, MISSISSIPPI

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Redbay ambrosia beetle, *Xyleborus glabratus* Eichoff (Coleoptera: Curculionidae: Scolytinae), tunnels into the wood of trees and shrubs in the family Lauraceae (Fraedrich et al. 2008). Known hosts include, but are not limited to redbay (*Persea borbonia* (L.) Spreng.), avocado (*Persea americana* Mill.), sassafras (*Sassafras albidum* (Nutt.) Nees), camphor (*Cinnamomum camphora* (L.) J. Presl), and swampbay (*Persea palustris* (Raf.) Sarg.) (Fraedrich et al. 2008). While the direct feeding damage caused by *X. glabratus* may not be significant, the beetle carries various species of fungal symbionts within mycangia at the base of its mandibles. As the female beetle bores into a tree, the fungal spores ooze from the mycangia and become established in the tunnels, where they serve as food for the adult beetle and larvae (Batra 1967; Fraedrich et al. 2008). One of these fungal symbionts, *Raffaela lauricola* T. C. Harr., Aghayeva, & Fraedrich, causes laurel wilt (Fraedrich et al. 2008; Harrington et al. 2008, 2010), a disease that has had devastating impacts in areas of the southeastern United States. *R. lauricola* is the only ambrosia beetle symbiont known to cause a lethal vascular wilt disease (Fraedrich et al. 2008; Harrington et al. 2008, 2010). *X. glabratus* also carries the fungi *R. subalba*, *R. ellipticospora*, *R. arxii*, *R. fusca*, and *R. subfusca* in its mycangia. It is not known if or how these species interact with *R. lauricola* (Harrington & Fraedrich 2010).

Xyleborus glabratus is of Asian origin (India, Myanmar, Japan, and Taiwan) (Batra 1967; Rabaglia 2006). It was detected for the first time in the United States in 2002 near Savannah, Georgia (Rabaglia 2003; Rabaglia et al. 2006; Fraedrich et al. 2008; Harrington & Fraedrich 2010). Since then, the beetle has spread north into South Carolina and south into Florida (Fraedrich et al. 2008). Stands of redbay throughout these areas have been decimated by laurel wilt disease. Both laurel wilt disease and infestations of *X. glabratus* have also been reported from Jackson County, Mississippi (Riggins et al. 2010), far to the west of the contiguously infested areas in South Carolina, Georgia, and Florida. This represents the largest range expansion of *X. glabratus* in North America, and it is unclear if the beetles in Mississippi and Alabama originated from populations occurring along the Atlantic coast or represent a separate introduction from Asia. It is possible that a separate introduction occurred at the port city of Pascagoula in Jackson County, Mississippi. Phylogeographic research comparing the separate populations of *X. glabratus* in North America is in progress and should help clarify this unexplained phenomenon.

To monitor the spread of *X. glabratus* around Jackson County, Mississippi, we placed Lindgren funnel traps (Lindgren 1983) baited with manuka oil (Hanula & Sullivan 2008) within two coastal counties of Mississippi (Harrison and Hancock) and Mobile County, Alabama. We selected these locations because they are adjacent or near the previously reported Jackson County, Mississippi (Riggins et al. 2010) and contain healthy populations of redbay. As a result of this monitoring program, *X. glabratus* was collected in Mobile County, Alabama and Harrison County, Mississippi for the first time.

In Mobile County, Alabama (30.50752N, 88.37254W) 6 individuals of *X. glabratus* were captured in a trap that we monitored from 19 Sep 2010-3 Oct 2010. Two specimens were received by Natalia Vandenburg at the United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant and Protection Quarantine Unit in Maryland for confirmation. Both specimens were confirmed as *X. glabratus* and voucher specimens are deposited at the National Museum of Natural History, Washington, D.C. In the vicinity of the trap that captured the *X. glabratus* specimens, several camphor trees (*C. camphora*) were found with symptoms resembling laurel wilt disease. Wood samples were removed from these trees and sent to Stephen Fraedrich, USDA, Forest Service, Athens, Georgia, for confirmation of the associated fungal pathogen, *R. lauricola*. However, the presence of the pathogen could not be confirmed.

Twelve *X. glabratus* were captured in Harrison County, Mississippi (30.46108N, 88.89206W) in 2 traps we monitored from 7-21 Aug 2010 and 4-18 Sep 2010. Specimens were confirmed as *X. glabratus* by Terence Schiefer. These specimens represent the westernmost detection of *X. glabratus*

in North America. We found no lauraceous species with symptoms of laurel wilt disease nearby and the closest known infested tree was approximately 5 km away. Natural dispersion for female *X. glabratus* is at least a few km (Cameron et al. 2008; Mayfield et al. 2009), and it is unusual for female beetles to travel several more km searching for hosts, particularly with many suitable host trees within close proximity; human mediated or wind driven transport is likely the cause of this increased movement.

Redbay mortality in Mobile County, Alabama, and in Harrison County, Mississippi is minimal, although the previously reported Jackson County, Mississippi infection site has suffered extensive mortality. We are expecting to see an exponential increase in redbay mortality throughout the newly reported areas as *X. glabratus* expands its range. As the beetles expand their range west across Harrison County, Mississippi into Hancock County, Mississippi they will encounter increased densities of sassafras. These populations of sassafras increase in density into the interior of Mississippi and sassafras distribution remains continuous throughout the state into Tennessee and beyond. Therefore, the potential for *X. glabratus* expansion into the interior United States through Mississippi is probable.

Summary

Xyleborus glabratus Eichoff (Coleoptera: Curculionidae: Scolytinae) is reported from the state of Alabama and from Harrison County, Mississippi for the first time. Beetle captures from Harrison County, Mississippi represent the westernmost detection of *X. glabratus* in North America. These beetles are disjunct from *X. glabratus* populations occurring along the Atlantic coast. This broad division between the two populations of *X. glabratus* has yet to be explained, and phylogeographic testing is underway to determine if a separate introduction from Asia into Mississippi has occurred.

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