

THE ASSOCIATION OF *XYLEBORUS GLABRATUS* AND AN *OPHIOSTOMA* SPECIES WITH MORTALITY OF RED BAY AND SASSAFRAS IN THE SOUTHEASTERN U.S.

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ABSTRACT

Extensive mortality of red bay (*Persea borbonia* [L.] Spreng) has been reported in coastal areas around Hilton Head Island, SC, and Savannah, GA, since the fall of 2003. In November, 2004 dead and dying red bay trees were examined on Hilton Head Island. Trees exhibited wilt-like symptoms and a distinct discoloration of the sapwood. Leaves on affected trees developed reddish to purplish brown discoloration and were persistent on branches. Samples from dead and dying red bay were collected and found to be infested with *Ambrosiodmus obliquus* (LeConte), *Xyleborinus gracilis* (Eichhoff) and numerous *X. glabratus* (Eichhoff). Samples of symptomatic tissues were also plated on various agar media and an anamorphic fungus was consistently isolated. This fungus has been subsequently identified as an *Ophiostoma* sp. (T. Harrington, personal communication), and morphological and molecular characterizations of the fungus are being conducted. Field and growth chamber studies have subsequently determined that the fungus is pathogenic to red bay and is capable of causing wilt in inoculated plants.

As of February of 2006, surveys have confirmed the presence of the disease in 10 coastal counties of South Carolina and Georgia. In the spring of 2005 the disease was also discovered near Jacksonville, FL. Most red bay trees are now dead in those areas where the disease has been observed since 2003. In all locations where the wilt has been observed, trees were infested by *X. glabratus*, and the *Ophiostoma* sp. was isolated from symptomatic plant tissues. Mortality of sassafras (*Sassafras albidum* (Nutt.) Nees) has also been found in some Georgia counties affected by the wilt of red bay. The dead and dying sassafras exhibit wilt-like symptoms and sapwood discoloration similar to that found in red bay. Laboratory analyses have found that the affected

sassafras were also infested with *X. glabratus*, and the *Ophiostoma* sp. was also isolated from symptomatic sapwood.

Xyleborus glabratus was first detected in the United States in 2002 near Port Wentworth, GA. The beetles were collected in traps that were part of a pilot project for the early detection of bark beetles at ports of entry. This project is being conducted by the USDA Forest Service in cooperation with APHIS, state agencies and universities. The subsequent discovery that *X. glabratus* was associated with dead and dying red bay on Hilton Head Island in November of 2004 was the first indication that this beetle was established in forests within the United States. *Xyleborus glabratus* is native to southern and eastern Asia, and its hosts in Asia are primarily in the Lauraceae. In North America its two recorded hosts, red bay and sassafras, are also members of this family. The beetle is a small, but distinctive member of the ambrosia beetle tribe xyleborini. There are 40 members of this tribe in North America, 19 of which are non-native. Many of these non-native species are from southeastern Asia, and have been introduced within the past 20 years. Although only a few of these species have become pests, some species occasionally cause losses of apparently healthy or slightly weakened landscape trees and nursery stock.

All species in the xyleborini are ambrosia beetles that carry symbiotic fungi. Adult females vector spores of the fungi which grow in the galleries in the infested tree. Entrance holes and galleries of *X. glabratus* in red bay were found to have staining and signs of fungal infection. Studies are continuing to better understand the relationship between *X. glabratus* and the *Ophiostoma* sp., as well as better understand the epidemiology of this disease.