First Report of *Xyleborus glabratus* (Coleoptera: Curculionidae: Scolytinae) and Laurel Wilt in Louisiana, USA: The Disease Continues Westward on Sassafras

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First report of Xyleborus glabratus (Coleoptera: Curculionidae: Scolytinae) and laurel wilt in Louisiana, USA: the disease continues westward on sassafras

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Laurel wilt, caused by Raffaelea lauricola Harrington, Fraedrich & Aghayeva (Ophiostomatales: Ophiostomataceae), has spread rapidly through the coastal plains forests of the southeastern United States (USA) with devastating effects on redbay (Persea borbonia [L.] Spreng.; Lauraceae) populations (Fraedrich et al. 2008; Harrington et al. 2008). The pathogen that causes the disease is a fungal symbiont of the redbay ambrosia beetle, Xyleborus glabratus Eichhoff (Coleoptera: Curculionidae: Scolytinae), and is carried in the mandibular mycangia of the beetle (Fraedrich et al. 2008). The beetle and fungus were introduced from Asia into the USA near Savannah, Georgia, around 2002 (Fraedrich et al. 2008; Harrington et al. 2011). Other members of the Lauraceae indigenous to the USA such as sassafras (Sassafras albidum [Nuttall] Nees; Lauraceae) are also highly susceptible to the disease (Fraedrich et al. 2008), but sassafras is less common than redbay in the coastal plains of the Southeast (Koch & Smith 2008). Unlike redbay, which occurs only in the coastal plains, sassafras is widespread and occurs in forests over much of the eastern half of the USA. Many questions remain about the spread of laurel wilt on sassafras in forest types that are located inland and away from the coastal plains of the Southeast.

On 2 Sep 2014, nine open-grown sassafras trees (38–61 cm diameter at breast height) were observed with wilt-like symptoms near Bernice (Union Parish), in northern Louisiana (32.814184°N, 92.671021°W). Dead foliage on the trees remained attached to branches or had abscised, and black discoloration and small tunnels were observed in the sapwood of the stems. Samples of the discolored sapwood were obtained from 2 of the trees and plated on malt extract agar (MEA) amended with cycloheximide and streptomycin as previously described (Harrington 1981; Harrington 1992; Fraedrich et al. 2008). A fungus morphologically identical to R. lauricola was consistently recovered from the samples, and the isolates were confirmed as R. lauricola using sequences of the D1/D2 region of the 28S rRNA gene (Harrington et al. 2008, 2010).

Two isolates identified as R. lauricola were evaluated for pathogenicity in growth chamber tests. The isolates were grown on MEA for 21 d at 25 °C, and plugs of agar with the fungus were inserted into 5 mm diameter holes in the stems of 3 redbay saplings (3 yr old; mean height = 183 cm; mean diameter at ground line = 21 mm) for each isolate, and then saplings were placed in a growth chamber with daytime and nighttime temperatures set at 28 and 25 °C, respectively (Fraedrich et al. 2008). Three additional saplings were similarly mock-inoculated with sterile MEA plugs. The results of the tests showed that the isolates of R. lauricola were highly pathogenic. Symptoms of wilt were observed in the 6 saplings inoculated with R. lauricola within 12 d, and the saplings completely wilted within 30 d. Control saplings remained healthy with no symptoms of wilt.

Three 12-unit Lindgren funnel traps baited with manuka oil lures (Hanula & Sullivan 2008) were deployed near the symptomatic trees on 2 Sep 2014, and 157 female X. glabratus beetles were collected from these traps during the month of Sep. A sample of the beetles was subsequently forwarded to Steven Lingafelter (United States Department of Agriculture, Agricultural Research Service, Systematic Entomology, Riverdale, Maryland, USA), who confirmed the species as X. glabratus.

Additional surveys for symptomatic sassafras trees and X. glabratus were initiated on 29 Sep 2014 in order to better understand the extent of the infestation. Lindgren traps baited with cubeb oil lures (Hanula et al. 2013) were deployed at 13 additional sites that were located in 3 parishes (Lincoln, Claiborne, and Union) at distances of 6 to 15 km from the Bernice site. Collections were made weekly until 15 Oct 2015. In addition, informal surveys were conducted in the 3 parishes for sassafras trees with wilt-like symptoms, and sapwood samples were collected from 6 additional symptomatic trees and plated on agar media as previously described.

The survey for X. glabratus found the beetle in all 3 parishes at 5 of the 14 trapping sites at locations up to 10 km from the Bernice site (Table 1). Furthermore, R. lauricola was isolated from 5 additional symptomatic sassafras trees located in Lincoln and Claiborne Parishes, and found as far away as Ruston, Louisiana, which is 27 km south of the Bernice site.

The discovery of sassafras with laurel wilt in northern Louisiana represents a major extension of the known distribution of the disease and the first record west of the Mississippi River. The previously known westernmost locations for laurel wilt were on redbay in Harrison County, Mississippi, approximately 400 km to the southeast and on sassafras in Marengo County, Alabama, 450 km to the east. The Louisiana discovery provides additional concerns about the continued spread of the disease because this area is outside the range of the primary host,
Xyleborus glabratus Eichhoff (Coleoptera: Curculionidae: Scolytinae) and sassafras trees that died from laurel wilt were discovered in a 3-parish area of northern Louisiana, USA, in Sep 2014. Redbay, a species that has been severely affected by the disease in the coastal plains forests of the southeastern USA, is not found in this area of northern Louisiana, suggesting that sassafras is attractive to X. glabratus and an adequate reproductive host for the beetle. This is the first report of X. glabratus in sassafras trees in northern Louisiana.
glabratus and laurel wilt in Louisiana and the first report of the beetle and disease west of the Mississippi River.

Key Words: Raffaelea lauricola; redbay ambrosia beetle

**Sumario**

En septiembre del 2014, Xyleborus glabratus Eichhoff (Coleoptera: Curculionidae: Scolytinae) y árboles de sasafrás que murieron a causa de la marchitez del laurel fueron descubiertos en un área de 3 municipios del norte de Louisiana, EE.UU. El aguacatillo (Persea borbonia), una especie que se ha visto gravemente afectada por la enfermedad en los bosques de la llanura costero del suroeste de EE.UU., no se encuentra en esta zona del norte de Louisiana, lo que sugiere que el sasafrás es atractivo para X. glabratus y un hospedero reproductivo adecuado para el escarabajo. Este es el primer informe de X. glabratus y la marchitez del laurel en Louisiana y el primer informe del escarabajo y la enfermedad al oeste del río Mississippi.

Palabras Clave: Raffaelea lauricola; escarabajo ambrosia del laurel rojo

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