

Sugarberry Dieback and Mortality



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Outline

- Sugarberry trees
- Dieback and mortality
- Current UGA research



Sugarberry Trees

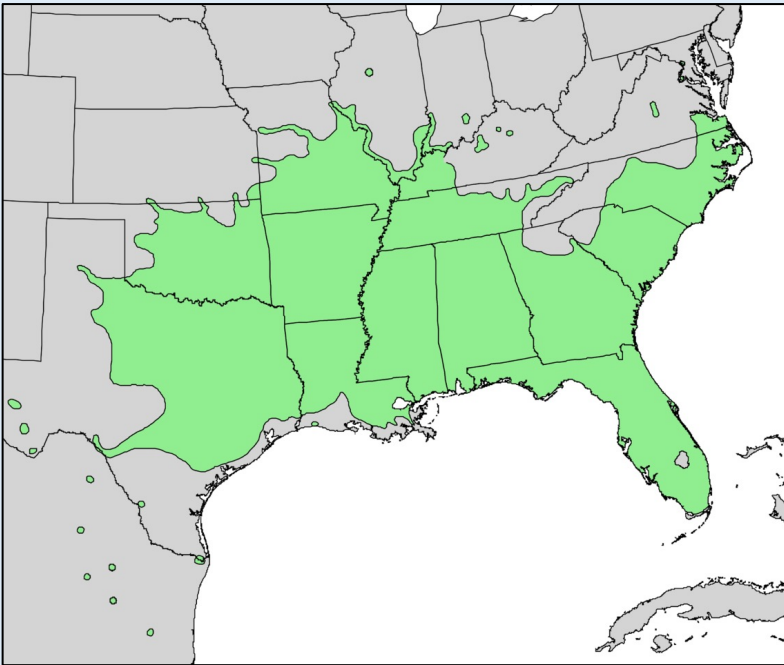
- Sugarberry – Southern Hackberry, *Celtis laevigata*
- Can be confused with Common Hackberry, *Celtis occidentalis*
- Habitat: street planting, vacant lots, fencerows, along streams, bottomlands



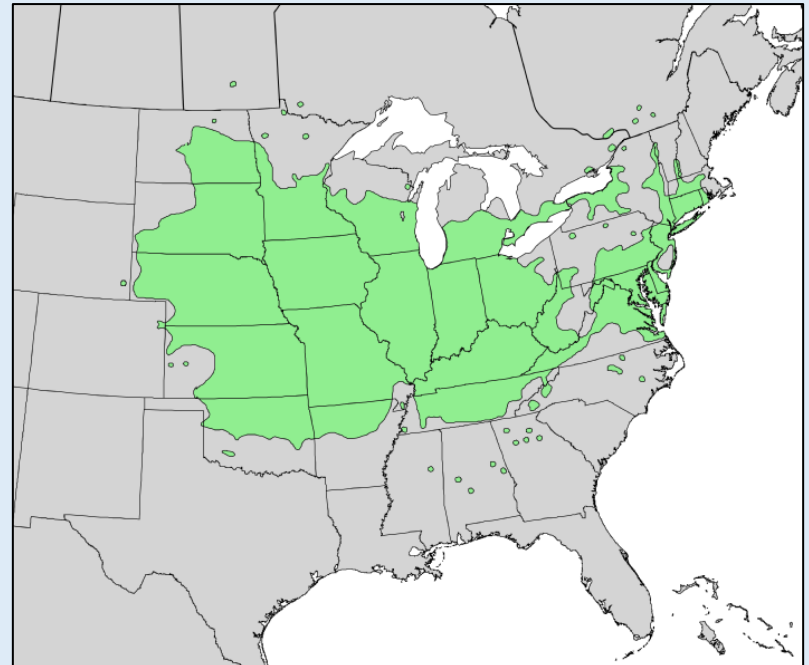
Wendy VanDyk Evans, Bugwood.org

Sugarberry

Common Hackberry



**Smoother leaves,
rounded leaf bases,
leaves have few teeth.**



**Coarser leaves,
sandpapery on top**

Sugarberry Trees

- Medium sized tree – up to 80 feet
- Leaves:
 - Ovate to narrowing tip
 - About 4 in long
 - Smooth margins
 - Unequal base
 - Leaf margins may have few teeth

Leaves



Sugarberry Trees

- Bark: smooth and pale with corky patches
- Flowers: green, springtime
- Berries: dull red, late-summer to winter



Celtis laevigata



Red drupes (fruit)



Distinctive branching pattern



Earlier species to leaf out



Sugarberry Trees

- Over 10 species of birds feed on the drupes
- Larval host of hackberry emperor butterfly, *Asterocampa celtis*
- Wood used for furniture, athletic goods, and plywood
- Galls common on leaves – not the mortality issue
- Asian Woolly Aphid, *Shivaphis celti*, can be a pest

<https://newswire.caes.uga.edu/story.html?storyid=4882&story=Woolly-Aphids>

woolly hackberry aphid



hackberry emperor butterfly

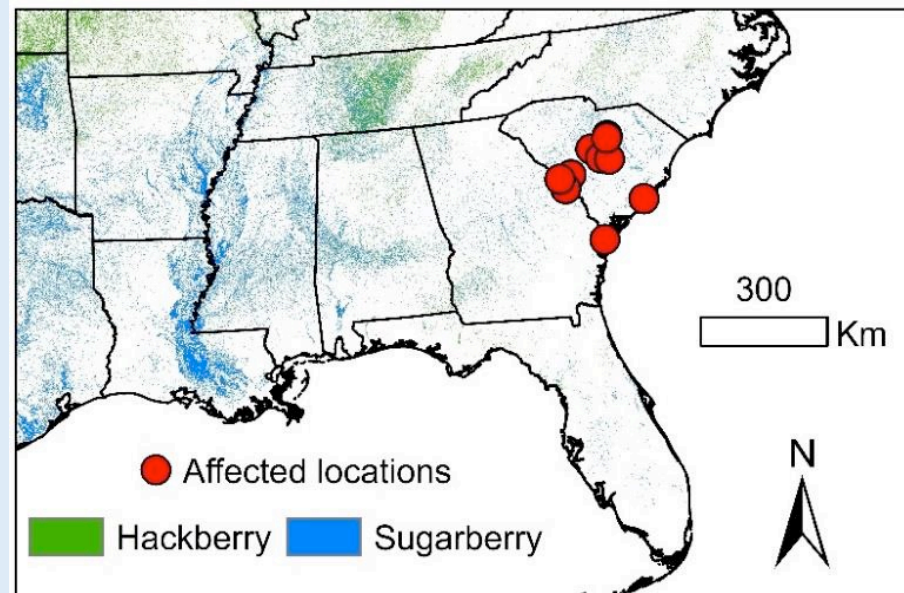


Galls on leaves



Sugarberry Dieback and Mortality

- First reported in 2009, Columbia, SC
- Most conspicuous in urban/suburban areas
- Trees also dying in forests
- Most severe sugarberry mortality issue



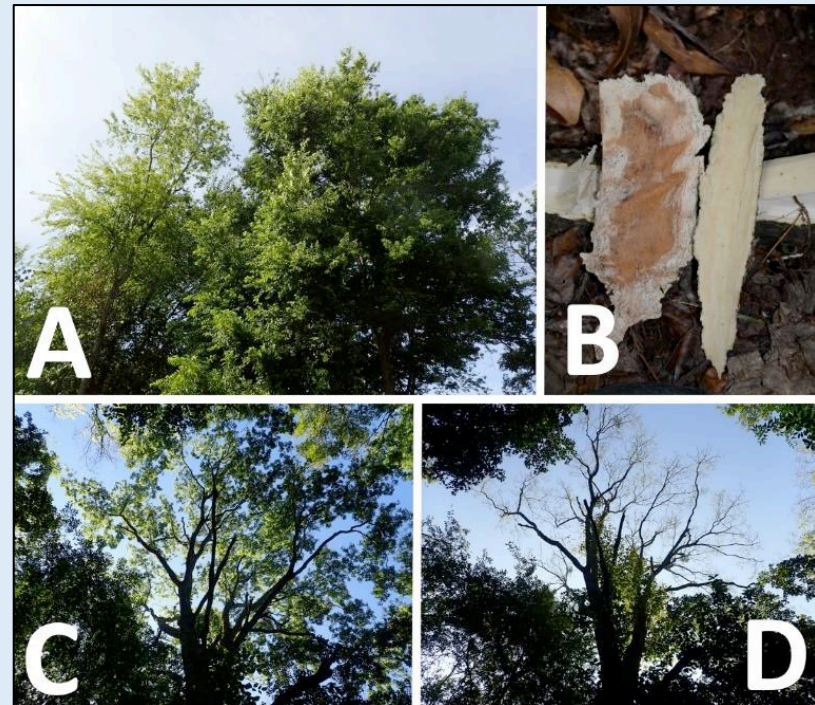
Sugarberry Dieback and Mortality

- No known causative agent yet
- Georgia – Augusta through the Savannah River corridor
- 1,000+ trees dead in Savannah
- City of Savannah removal costs - \$250,000



Sugarberry Dieback and Mortality

- Progressive crown deterioration
- Thinning begins at branch tips
- Spreads throughout the canopy
- Phloem is often dark brown
- Slow or rapid deterioration



USFS Pest Alert: Sugarberry dieback and mortality. USFS R8-PR-02-19.

A: Symptomatic sugarberry (left) next to a healthy tree (right)

B: phloem (underside of bark) from symptomatic (left) and healthy (right) trees

C and D: the same tree photographed in 2016 (left) and 2019 (right) showing progressive crown deterioration

Mortality Progression



Mortality Progression



Dead

Active Thinning

Thinning begins



Asian Woolly Hackberry Aphid
located on the underside of
sugarberry leaves



Sooty mold causes darkening of foliage



Fresh green foliage and
leaves darkened by
sooty mold.

Discolored

Flatheaded Hackberry
Borer (*Agrilus macer*)
laying eggs on a
sugarberry.



A. macer tunnels
created under the
bark.
Fungi in tunnels not
associated with
mortality.
Poole et al. 2019

Biscogniauxia (Hypoxylon)
canker visible on bark
surface. Often found on
trees as they die.
Opportunistic – typically do
not attack healthy trees.



Armillaria gallica mycelial
mat under the bark.
Shoestring root-rot fungi.
Opportunistic pathogen of
hardwood trees that are
already weakened

UGA and USFS Sugarberry Research

Villari Forest Pathology Lab → <http://villarilab.com/>

- Potential role of microbes in dieback and mortality

USFS Southern Research Station, Emilee Poole

- Effects of Asian Woolly Hackberry Aphid attacks on sugarberry health status

Explore the microbial community associated with healthy and unhealthy sugarberry trees using a metabarcoding approach



- 10 plots
- 1 symptomatic and 1 asymptomatic tree per plot
- DNA extraction and sequencing
- Assess microbial communities



Investigate the presence of phytoplasmas



- Phytoplasmas cannot be cultured
- Using classic molecular methods



- Confirmed the presence of phytoplasmas in some samples
- Still investigating if they have a role in the mortality

**The cause of
sugarberry dieback
and mortality is still
unknown.**

- Assess asian hackberry woolly aphid populations on healthy and unhealthy sugarberry trees
- Assess annual population changes
- Investigate insecticide treatments



Helpful Websites

- Sugarberry Dieback and Mortality
<https://sugarberrymortality.wixsite.com/ento>
- Carolina Nature - Will Cook, Duke University
<http://www.carolinanature.com/trees/cela.html>
- Wildflower.org, The University of Texas
https://www.wildflower.org/plants/result.php?id_plant=CELA
- Missouri Botanical Garden
<https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a857>
- University of Florida
<https://edis.ifas.ufl.edu/st138>
- *A. macer* Extension Fact Sheet <https://lpress.clemson.edu/publication/agrilus-macer-a-secondary-pest-on-sugarberry-trees-in-the-southern-united-states/>



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