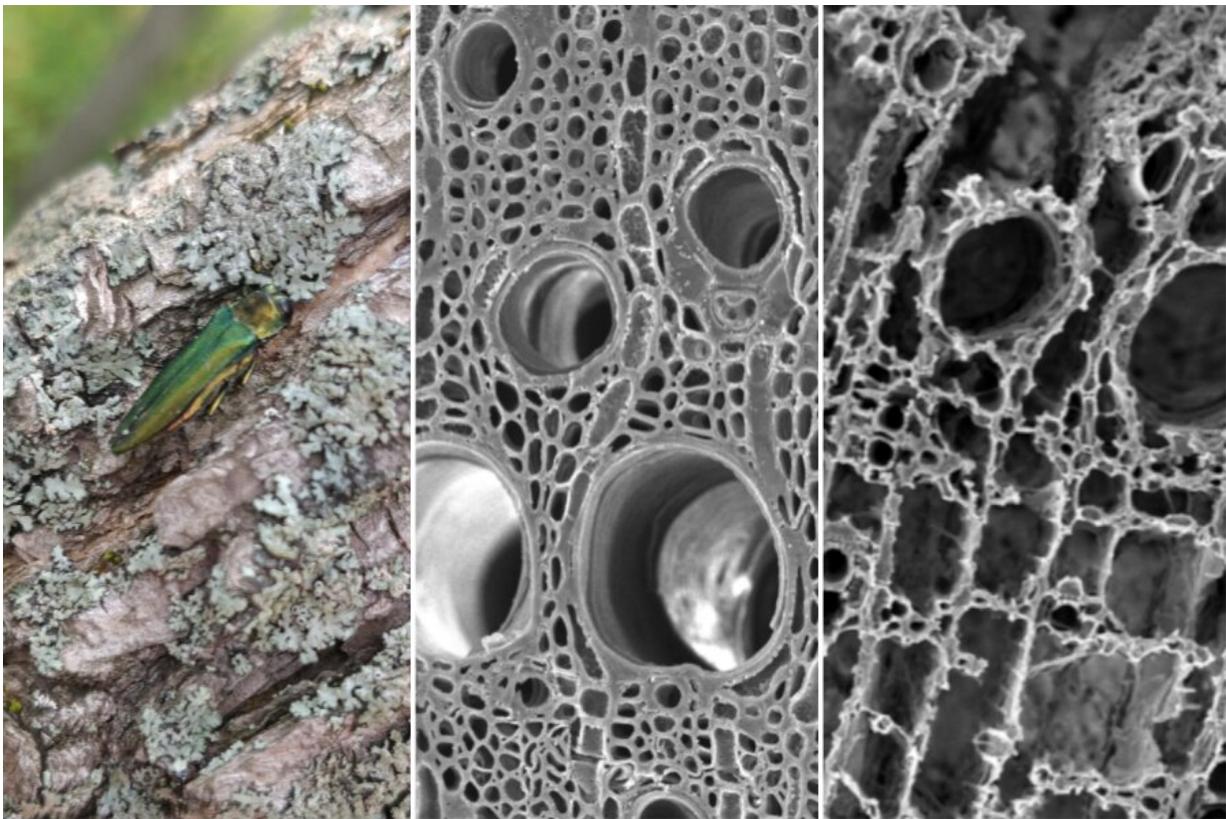


Fungi contribute to loss of structural strength in trees attacked by emerald ash borer

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From left to right: Image of emerald ash borer on a branch, micrograph of sound wood and micrograph of decayed wood. Credit: Benjamin Held and Sofía Simeto

Since the emerald ash borer (EAB) was first detected in North America in 2002, the invasive beetle has killed hundreds of millions of mature ash trees. After an attack, branches and trunks weaken and the trees become more likely to fall. Though this degradation has historically been attributed to damage from the beetles, new research from the University of Minnesota confirms that fungi play a significant role in the process.

Researchers from the Department of Plant Pathology and the Minnesota Invasive Terrestrial Plants and Pests Center recently published their findings in the journal *Forests*.

"When ash trees get attacked by the [emerald ash borer](#) they lose structural integrity quickly, limbs and the main stems can fail and the tree becomes hazardous. We now know the identity of several of these very aggressive pioneer species of decay fungi that are responsible," said Robert Blanchette, a professor in the Department of Plant Pathology.

The study was conducted by testing wood decay fungi on ash wood samples under laboratory conditions using [fungal species](#) that were previously obtained from beetle galleries. By learning how much wood degradation these fungi can produce in a short period of time on ash wood, researchers could infer the role they play in the loss of structural strength of beetle-attacked trees.

The researchers found:

- Several aggressive pioneer species of white rot fungi associated with EAB galleries caused extensive degradation of wood cell walls.
- The wood samples treated with decay fungi experienced a significant loss of biomass. Significant structural damage of wood cells was documented using scanning electron microscopy.
- Since some very aggressive decay fungi associated with EAB

galleries were able to produce an important loss of wood structural strength in a relatively short period of time during this study, researchers concluded these fungi likely play a major role in contributing to the loss of [wood](#) integrity and hazardous tree conditions after EAB attack.

"It is still not clear how these fungi get involved with EAB as the beetle is not specialized in carrying [fungal spores](#), but our previous studies show that these fungi are in fact associated with EAB galleries. Based on that and the extensive decay ability some of the fungi showed during this study, it is clear that they can greatly contribute to the loss of structural strength observed on EAB-attacked trees," said first author Sofía Simeto, a graduate student in the Department of Plant Pathology.

These findings help land managers, municipalities and property owners better understand what happens to the trees after EAB attack and demonstrate the need to remove EAB-affected trees before these aggressive [decay fungi](#) become established. Ash trees left standing without treatment after EAB attack will lose their [structural integrity](#) and rapidly become hazardous and subject to branch, limb and trunk failure. These findings will help stakeholders make safer decisions while working with infected trees.

More information: Sofía Simeto et al, Wood Decay Fungi Associated with Galleries of the Emerald Ash Borer, *Forests* (2023). [DOI: 10.3390/f14030576](#)

Provided by University of Minnesota

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