

**ML 2016, Ch 186, Sec. 2, Subd. 6a Minnesota Invasive Terrestrial Plants and Pests Center**

For the Period Ending June 30, 2022

**PROJECT TITLE:** Studies of Fungi Associated with the Emerald Ash Borer: Finding effective biocontrol agents and elucidating the role of fungi during ash decline and mortality.

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<http://forestpathology.cfans.umn.edu/publications.htm>

**FUNDING SOURCE:** Environment and Natural Resources Trust Fund

**LEGAL CITATION:** ML 2016, Ch 186, Sec. 2, Subd 6a

**APPROPRIATION AMOUNT:** ~~\$472,757~~ \$500,000

**AMOUNT SPENT:** ~~\$472,757~~ \$500,000

**AMOUNT REMAINING:** \$0

**Sound bite of Project Outcomes and Results**

Important new findings have been obtained about the fungi associated with the emerald ash borer (EAB). This knowledge helps better understand the biology and ecology of EAB invasion and provides new biological control agents that can be used to help manage this invasive pest.

**Overall Project Outcome and Results**

The emerald ash borer (EAB) is an exotic beetle that has been introduced into the United States and is currently causing serious losses of ash trees in Minnesota. To effectively manage this pest, it is essential to understand the biology and ecology of the beetle and associated microorganisms. Our research has identified the diverse fungi that are associated with EAB. These include i) canker causing fungi that work along with EAB to kill trees, ii) aggressive pioneer decay fungi that enter EAB wounds and cause hazardous conditions in ash trees attacked by the beetle and iii) fungi that can kill EAB with potential use as biological control agents. Laboratory and field studies have been done to test the pathogenicity of selected fungi on eggs, larvae and adult EAB. These studies have shown that fungi can kill EAB and several species have been evaluated and are now available for field trials. This method of control for EAB provides an additional tool that natural resource managers will be able to use to control the pest. Methods of spraying and injecting trees have also been tested. Other fungi obtained from EAB galleries produce lesions and pathogenicity studies show that several of these canker causing fungi work in concert with EAB to kill trees. We also have a better understanding of the pioneer species of decay fungi that come into wounds made by EAB. These fungi cause extensive decay and strength losses early in the colonization process resulting in affected ash to become hazardous. These results, which are especially important in the urban landscape, indicate that timely tree removal is needed to avoid hazards produced by EAB associated wood decay fungi. Our research results provide important new findings for integrated pest management that will benefit Minnesotans long into the future.

**Project Results Use and Dissemination**

Results have been disseminated in scientific publications, presentations and news releases. This includes journal articles on the diverse fungi associated with the emerald ash borer and fungi from EAB that produce cankers in ash trees, as well as presentations on the ovicidal effects of fungi on EAB and other aspects of biological control and management of EAB. Numerous news releases on fungi attacking EAB, protecting Minnesota's ash trees and others have taken place.