

ML 2016 Chapter 186, Section 2, Subd 6a Project Abstract

For the Period Ending June 30, 2023

PROJECT TITLE: MITPPC Sub-project #10 A Portable Diagnostic Platform for Early Detection of Invasive Plants and Pathogens

PROJECT MANAGER: Dr. Abdennour Abbas

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FUNDING SOURCE: Environment and Natural Resources Trust Fund

LEGAL CITATION: ML 2016, Chapter 186, Section 2, Subd. 6a

APPROPRIATION AMOUNT: \$170,637

AMOUNT SPENT: \$170,637

AMOUNT REMAINING: \$0

Sound bite of Project Outcomes and Results

Oak wilt is a tree disease that causes major losses to Minnesota's forests, natural resources and economy every year. One of the key solutions to fighting this disease is early detection to enable timely decision making and prevention. The research effort conducted in this project over the last two years led to a successful development of a new technology for oak wilt detection in the field. The technology will soon be used in the field to enable early detection and prevention.

Overall Project Outcome and Results

The project led to a successful development of a new nucleic acid visualization technology that was successfully used to develop and test a new LAMP assay for field detection of oak wilt. This development led to a new collaboration to work on a field test demonstration (ongoing), and to establishing a collaboration with an industry partner for potential product development. Furthermore, the research results were disseminated in two publications and two oral presentations in national conferences. In addition, an invention disclosure was submitted to the University of Minnesota Office of Technology Commercialization.

Project Results Use and Dissemination

Research results are disseminated through two peer-reviewed scientific publications and two oral presentations at two of the largest national conferences.

Publications:

1- V. Novi and A. Abbas., "Naked-eye visualization of nucleic acid amplicons using hierarchical nanoassembly", *Analytical Methods*, 2023. <https://pubs.rsc.org/en/content/articlelanding/2023/ay/d3ay01050c>

2-V. Novi and A. Abbas., "A Rapid LAMP Assay for the Diagnosis of Oak Wilt with the Naked Eye", Submitted, 2023.

Conferences:

1- The American Chemical Society (ACS) Fall Meeting Gold nanoparticle mediated colorimetric detection of LAMP products to diagnose oak wilt disease, August 13-17, 2023, San Francisco, California

2- American Institute of Chemical Engineers (AIChE) Annual Meeting, "Rapid Lamp Visualization Using Functionalized Gold Nanoparticles to Detect *Bretziella fagacearum*", November 5-10, 2023, Orlando, Florida.