CITRUS ADVANCED TECHNOLOGY PROGRAM

QUARTERLY & FINAL REPORTS: Control of Citrus Greening, Canker & Emerging Diseases of Citrus

▶ SELECT PERIOD June 2013

○ *Quarterly Report* ● *Final*

Proposal Title

Infection traits and growth of "Candidatus Liberibacter asiaticus" inside microfluidic chambers

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
7/26/13	Citrus Research and Development Foundation	Culture, Molecular Biology, Koch's Postulates

REPORT UPDATE (500 words-It is not necessary in this public report to disclose your institution's proprietary information or intellectual property.)

The major aim of this research was to develop a method for in vitro culture of 'Candidatus Liberibacter asiaticus' (LAS). Specifically, it was hypothesized that microfluidic chambers, by mimicking plant phloem vessels to which LAS is restricted, could be used to facilitate LAS culture. However, liquid culture medium optimization was required prior to successful study of LAS in microfluidic chambers. Therefore, research was focused on systematically quantifying LAS viability over time in different culture media to identify the characteristics of a suitable culture medium for LAS.

In the first year of the project, experiments were conducted to compare LAS viability characteristics among different media types over time via EMA-qPCR. In the second year of this project, all data was analyzed from the first year's experiments. Additional experiments were conducted to analyze the bacterial community composition of the biofilm formed in the media treatments as well as the chemical characteristics of the media tested. The overall finding was that LAS culture media containing citrus juice from different sources promoted cell viability. A peer-reviewed publication of these results has been produced: “Viability of ‘Candidatus Liberibacter asiaticus’ prolonged by addition of citrus juice to culture medium” (2013, Phytopathology).

In this publication, we indicate many features of our experiments that will be informative in future design of a successful culture medium for LAS. This publication represents the first significant published contribution to finding a solution for the culture of LAS since the publications from Davis et al. (2008) and Sechler et al. (2009). Future work will focus on refining this liquid medium and testing potential new media formulations both in batch culture as well as in flow conditions in microfluidic chambers.

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