CITRUS ADVANCED TECHNOLOGY PROGRAM

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

▶ INSTRUCTIONS

○ *Quarterly Report* ◉ *Annual Report* ○ *Final*

Required: What is the "headline" for this report (e.g. a one-sentence "newspaper headline" describing what you accomplished)

Hosts of the Psyllid and Hosts of Liberibacter

Proposal Title

Alternative Hosts for HLB to Assist in Disease Management

Today's Date	Sponsoring Organization (drop-down)	Category (drop down)
4/7/11	Citrus Research and Development Foundation	Infection Consequences

REPORT UPDATE (500 words; summarize your accomplishments)

Work continued to determine the suitability of Rutaceae species for the development of the Asian citrus psyllid and as hosts for the various species of Candidatus Liberibacter. The psyllid successfully colonize and reproduce on Choisya ternata, C. arizonica, and Helietta baretta in no-choice tests, but reverted back to its preferred hosts, orange jasmine (Murraya paniculata) and curry leaf (Bergera koenigii) in choice tests. On Amyris madrensis, A. texana and Zanthoxylum fagara eggs were laid and hatched but no nymphal development beyond first instart was found. Psyllid reproduction did not occurred on Esenbeckia berlandieri, Ptelea trifoliata nor Casimiroa edulis, although adult survived on these species. Severinia buxifolia is a frequently grown ornamental on which psyllids feed and reproduce. As previously reported we were able to transmit Ca.Liberibacter asiaticus to it by grafting. Symptoms in S. buxifolia were very nondescript with only thickened leaves and some vein corking. Live bacterial populations were measured monthly in the plants using a newly devised qPCR method. Transmissions of Candidatus Liberibacter asiaticus were successfully done from S. buxifolia to both healthy sweet orange and to healthy S. buxifolia in two separate tests. To date we have a 50% transmission rate from S. buxifolia to sweet orange and a 72% rate from S. buxifolia to S. buxifolia. Data showed that the bacterial populations in S. buxifolia declined over time if not exposed to infective PCR positive psyllids. Generic PCR primers developed were successful in detecting all know species of Candidatus Liberibacter. In S. buxifolia the titer of the Ca. Liberibacter asiaticus began getting lower like that seen with M. paniculata. In testing these plants with the generic primers a good titer of Ca. Liberibacter was found. The identification of this bacterium is ongoing. Esenbeckia sp.was identified as qPCR positive after psyllid transmission tests making it a new host for Ca. Las. Ca. Liberibacter asiaticus infected periwinkle and dodder were found to have higher live bacterial levels than source citrus plants. These studies will determine if certain plants are good hosts of live bacteria. Attempts to transmit Ca. Liberibacter africanus with D. citri failed. The number of psyllids used, length of acquisition and inoculation periods had no effect. The psyllid colony were pre-tested for presence of the bacterium and were tested again after acquisition and after inoculation and all tested negative for the bacterium. Ca. Laf source plants had Cq values in the low 20's. Dodder transmission of Ca. Laf from sweet orange to Choisya X Aztec Pearl, periwinkle, and sweet orange was obtained but not to Severinia buxifolia. Dodder was highly infected as was the sweet orange and periwinkle, but Choisya had lower bacterial levels. Two sets of general ITS primers and new specific Ca. Laf ITS primers (Postnikova 2011) were used to generate PCR products for cloning and sequencing. Five clones from Laf infected Choisya were confirmed to be Laf. Murraya paniculata was confirmed to be a host of Laf, by PCR, cloning and sequencing. Tests were initiated to dodder transmit Laf to Bergera koenigii and M. paniculata. C. ternata, Choisya X. Aztec Pearl, and Choisya 'Sundance' were inoculated with the B239 Taiwanese isolate of Las with psyllids and Choisya X Aztec Pearl with dodder. To date all PCR assays have been negative with psyllid transmission to C. ternata. Fortunella polyandra, Clausena harmandiana, and C. excavata were obtained for testing. Work to further test the susceptibility or resistance of the cultivar IAPAR73 continued using psyllid transmissions and low numbers of qPCR positive plants were obtained.

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Organization University of Florida

Contract Number 16

Project Duration (years) 3 *Year of Project* 2

Total Funds (current year) $204,325.00

SUBMIT REPORT

CITRUS RESEARCH AND DEVELOPMENT FOUNDATION, INC.