Florida Citrus Advanced Technology Program

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

Instructions Complete the fields based on your project specs. When finished, save the form to your local disk using a unique name. Then, go to **http://research.fcprac.com**, and log in with your user name and password using Researcher Login in the lower left. Find this project title and click on **Submit a Report**. Update your profile information if needed, then upload this report as directed.

2009-2010 REPORT	CATEGORY (drop-down)	TODAY'S DATE (m/d/yr)
(●) *Quarterly Report* ( ) *Annual Report* ( ) *Final*	Psyllid	7/15/10

WHAT IS THE "HEADLINE" FOR THIS REPORT (e.g. a one-sentence "newspaper headline" describing what you accomplished)

Male Asian citrus psyllids are attracted to female ACP cuticular extracts.

TITLE and CONTACT INFORMATION

Proposal Title Identification of psyllid attractants and development of highly effective trapping and attract-and-kill methods for improved psyllid control

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REPORT UPDATE (650 words; provide details about your headline)

The purpose of this proposal is to identify and develop pheromone based attractants for the Asian citrus psyllid (ACP) in order to develop effective monitoring traps to evaluate ACP population densities and better determine the need for spraying. Behavioral bioassays in the laboratory confirmed that virgin and mated male ACP adults are attracted to female ACP in olfactometers. These data suggest that female ACP produce an attractant for male ACP. Most recently, we analyzed whole cuticular extracts of male and female ACP in behavioral olfactometer experiments and in field trials. The cuticular extract from female ACP adults attracted male ACP in laboratory bioassays. In no case did male ACP cuticular extract attract female ACP in the laboratory. Additionally, male and female ACP were not attracted or repelled by same sex ACP individuals in laboratory biaoassays.

Field trials with male and female ACP cuticular extracts at various dosages using yellow and clear sticky traps indicated that cuticular extracts of both female and male ACP were attractive to feral psyllids as compared with blank untreated traps in the field up to 3 days. However, more males than females were attracted to the extracts of females. Traps with female cuticular extracts attracted significantly more male than female ACP adults. Additionally, traps loaded with male or female cuticular extract attracted more ACP than control traps with no extract. All traps attracted roughly equivalent numbers of ACP adults when the traps were left in field for 15 days or more. The clear traps generated more conclusive results than the yellow traps although yellow traps attracted more total ACP adults than the clear traps. These results indicated a possibility of female produced attractant, but also suggest the possibility of an aggregation pheromone. Our results in the field were different from those observed in the lab given that it appeared in the field that male extracts were also attractive; however, those extracts were not attractive in laboratory assays. It is possible that females captured on traps, due to attraction to the yellow color, contributed to subsequent attraction of males via a chemical attractant, which may obscure the field data compared with the lab data. More field testing is needed.

Chemical analysis of female and male ACP cuticluar extracts with GC-MS indicated that female are characterized by certain chemicals that were not present in male cuticular extracts including isomers of lactones and decanoic acids. Also, there were certain chemicals that were present in higher relative amounts in female cuticular extracts than in those of males. We also analyzed male and female honey dew secretions. GC-MS of honey dew secretions indicated that there were several chemicals that were common between honey dew secretions of both sexes and those of male and cuticular extracts. Behavioral bioassays with chemicals found exclusively in female cuticular extracts indicated that male ACP were attracted to dodocenoic acid in laboratory bioassays. Our previous laboratory experiments with ACP yielded similar results with γ butyralactone; however ACP were not attracted to this chemical in the field. We continue to evaluate chemicals that are exclusively found in female cuticular extracts to determine if they attract males to refine the blend and its dosage in an effort to develop an attractive lure for the field.

Observations of ACP indicate that adults of both sexes oscillate their abdomen dorso-ventrally on both host plants and within olfactometers prior to mating. We examined the external morphology of the sensilla present on the subgenital plates and genital regions of ACP adults with scanning electron microscopy (SEM) to gain insight into the their function with respect to communication. We continue to determine the putative functions of the identified sensilla using transmission electron microscopy (TEM).