

Table Of Contents

Chapter 1: Introduction	1
Chapter 2: Literature Review	3
Life History	3
Significance as a Fruit Pest	3
RAPD-PCR	7
Reproductive Incompatibility Between Plum curculio strains and a potential role for <i>Wolbachia</i>	8
References	11
Chapter 3: Biochemical Separation of Plum Curculio Populations by RAPD-PCR assay	14
Introduction	14
Methods and Materials	15
Results	18
Discussion	23
References	25
Chapter 4: Biochemical Separation of Plum Curculio Populations Using the <i>Wolbachia</i> 16S rDNA and <i>wsp</i> Genes	27
Introduction	27
Methods and Materials	28
Results	33
Discussion	40
References	42
Chapter 5: Evaluation of Traps and Olfactory Attractants	44
Introduction	44
Methods and Materials	46
Results	48
Discussion	50
References	52
Chapter 6: Summary and Future Research	54
References	56
Appendix A:	57
Pairwise Comparison of <i>wsp</i> Gene Nucleotide and Predicted Protein Sequence	
Vita	60

List of Figures

Figure 1: Adult plum curculio feeding on apple	3
Figure 2: Oviposition damage on apple	3
Figure 3: Chemical structure of grandisoic acid	6
Figure 4: Range of plum curculio	7
Figure 5: OPE-01 and Georgia DNA samples	20
Figure 6: OPE-01 and Massachusetts DNA samples	20
Figure 7: OPE-03 and Georgia DNA samples	20
Figure 8: OPE-03 and Massachusetts DNA samples	20
Figure 9: OPE-04 and Georgia DNA samples	21
Figure 10: OPE-04 and Massachusetts DNA samples	21
Figure 11: OPE-07 and Georgia DNA samples	22
Figure 12: OPE-07 and Massachusetts DNA samples	22
Figure 13: Amplimers from <i>Wolbachia</i> 16S rDNA primers	34
Figure 14: Amplimers from <i>Wolbachia</i> <i>wsp</i> gene primers	34
Figure 15: Nucleotide phylogenetic tree	38
Figure 16: Predicted protein sequence phylogenetic tree	39
Figure 17: Chemical structure of grandisoic acid	45
Figure 18: Tedders Trap	46
Figure 19: Branch Mimic Trap	46
Figure 20: Trend of Plant Volatiles/Pheromone Interaction	50

List of Tables

Table 1: RAPD-PCR primers	17
Table 2: Approximate weights of novel amplimers	18
Table 3: Pairwise comparison of <i>wsp</i> sequences from 7 hosts	23
Table 4: Universal eubacteria 16S rDNA primers	30
Table 5: 16S rDNA primers for <i>Wolbachia</i> and <i>wsp</i> gene primers	31
Table 6: Consensus sequences for <i>wsp</i> gene	36
Table 7: Pairwise comparison of <i>wsp</i> gene sequences- listed by host	37
Table 8: Mean trap captures for 1999	49
Table 9: ANOVA for trap captures of plum curculio for 2001	49