Public Abstract

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Graduation Term:FS 2016

Department:Plant, Insect and Microbial Sciences

Degree:PhD

Title:Characterization of grapevine vein clearing virus expression strategy and development of caulimovirus infectious clones

The grape and wine industry is an important component of the Missouri economy. However, grape production is affected by several virus diseases, and a new disease was discovered in the Midwest in 2004. Typical symptoms are chlorotic veins (vein clearing), short internodes with a zigzag pattern, a rolling back of the leaf margin, and dwarfed plants. A newly discovered virus, Grapevine Vein Clearing Virus (GVCV), is proved to be closely associated with grapevine vein clearing syndrome observed in vineyards in Missouri and surrounding states. However, Koch's postulates have never been completed. Four projects related to GVCV are included in this dissertation. It was shown in this dissertation that the GVCV segment between nucleotides 7,332 and 7,672 was sufficient for transcription of the GVCV genome; transcription was initiated predominantly at nucleotide 7,571 and terminated at nucleotide 7,676; a terminally redundant infectious clone of GVCV was constructed and it was able to induce systematic infection in *Nicotiana benthamiana*; two types of putative GVCV virions were observed, the bacilliform virion typical of badnaviruses and a flexuous rod; finally, the citrus and longtailed mealybugs were investigated and eliminated as potential vectors for GVCV. This information is essential for completion of Koch's postulates and it is a step further toward efficient management of the grapevine vein clearing syndrome in the future.