

ABSTRACT

DIFFERENTIAL FEEDING BEHAVIORS OF TWO DISTINCT *APHIS GOSSYPHII* BIOTYPES USING THE DC ELECTRICAL PENETRATION GRAPH

Citrus tristeza virus (CTV) is one of the most important citrus diseases worldwide. The impact of CTV on US agriculture has been significant, affecting 50 million trees with economic losses in the hundreds of millions of dollars. In California, this virus is predominantly transmitted by two distinct *Aphis gossypii* biotypes: the cotton and the melon aphids. The feeding behaviors performed by the cotton and melon aphid biotypes were recorded on two citrus plants, Mexican lime (ML) and Madame Vinous orange (MVO), using the Giga 8 DC Electrical Penetration Graph (EPG) monitor. Each EPG treatment consisted of a single citrus plant and insect recorded for 12 h. Trials were conducted to compare the aphids' feeding activities on CTV-infected vs. non-infected citrus plants. Viruliferous vs. non-viruliferous insects were compared to test whether the presence of the virus had an effect on feeding activities. EPG waveforms such as E1 (representing phloem salivation), E2 (representing phloem ingestion), and others were measured and analyzed for duration and frequency. Both non-viruliferous cotton and melon aphids displayed significantly shorter durations of pathway activities and salivation on ML than on MVO citrus, showing that ML is highly susceptible to aphid feeding. In addition, ML was highly susceptible to inoculation-type feeding behavior performed by viruliferous melon aphids. These findings provide evidence for difference in feeding behavior performed by distinct *Aphis gossypii* biotypes and provide additional support for the high rate of susceptibility to CTV infection of ML citrus plants.

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