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PRE-ACQUISITION STARVATION DOES NOT INCREASE THE TRANSMISSION RATE OF *CUCUMBER MOSAIC VIRUS (CMV)* BY *APHIS GOSSYPHII*

Jiménez, J.(1), Webster, C.(2), Moreno, A.(1), Uzest, M.(2), Blanc, S.(2),
A.(1)

Fereres.

(1) ICA-CSIC, C/Serrano 115 dpdo. Madrid, Spain (a.fereres@csic.es)

(2) INRA, UMR385, TA-A54K, Campus International de Baillarguet,
Montpellier Cedex 05, France

BACKGROUND AND OBJECTIVES

Most plant viruses are transmitted in a nonpersistent (NP) manner by aphids. NP transmission occurs during very superficial probes of less than five minutes with subsequent transmissibility being lost within a few hours. Previous studies have shown that a pre-acquisition starvation period increases the transmission rate of NP viruses by altering their probing behaviour to make them more likely to acquire virions from epidermal cells. The main objective of this work was to study the effect of pre-acquisition starvation on the transmission rate of CMV and on the probing behaviour of *Aphis gossypii*.

MATERIAL AND METHODS

A series of transmission tests were carried out to compare the transmission rate of several CMV isolates (M6, Fny, V698, Ls, Val 24 and B20) by groups of five starved or nonstarved *A. gossypii* adults subjected to an acquisition access period (AAP) of 5 min on zucchini plants. Moreover, the probing behavior of single starved and nonstarved *A. gossypii* on a CMV-Fny infected plant and its associated virus transmission rate was compared using the Electrical Penetration Graphs (EPG) technique. Nonviruliferous aphids with a gold wire attached to their dorsum were divided in two different batches: some aphids were suspended in the air using a gold wire and thus not allowed to feed (starved) and others were placed directly on a healthy melon leaf and allowed to feed (nonstarved). After one hour, both starved and nonstarved aphids were placed on a CMV-Fny infected source zucchini plant until they produced a single intracellular stylet puncture (pd). Then, aphids were removed and individually transferred to a healthy zucchini plant for a 24 h inoculation access period (IAP) to assess the CMV-Fny transmission rate.

RESULTS

No significant differences were observed on the transmission rates of most CMV isolates between starved and nonstarved aphids. Only for the V698 isolate did starved aphids transmit significantly better than nonstarved aphids. CMV-Fny was the isolate with the highest transmission rate by *A. gossypii* after an AAP of 5 min. Pre-acquisition starvation did show a significant effect on the probing behavior of both *A. gossypii*. Starved aphids began probing faster and made longer intracellular punctures than nonstarved aphids. However, there were no significant differences on the transmission rate of CMV-Fny isolate between starved and nonstarved *A. gossypii*.

CONCLUSIONS

Pre-acquisition starvation of *A. gossypii* does not increase the transmission rate of most of the CMV isolates tested. However, starved *A. gossypii* behaved in a way that is known to enhance the transmission of other NP viruses such as Potyviruses, but such changes in probing behaviour did not increase the transmission rate of CMV.

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