

STUDIES ON VIRUS DISEASES OF PAPAYA  
(CARICA PAPAYA) IN PUERTO RICO<sup>1</sup>

II. Transmission of Papaya Mosaic by Green Citrus Aphid,  
(*Aphis spiraecola* Patch)

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As described in a recent paper (Adsuar 1945) a mosaic of papaya has been found attacking this crop in the southern coast of Puerto Rico. Although the disease has been transmitted both mechanically and by grafting, it was not until very recently that we have also successfully accomplished its transmission by means of the green citrus aphid, (*Aphis spiraecola* Patch).

This aphid, a major pest of citrus trees, in which it causes the well known "rosetting" of the leaves, seems to migrate to papayas during certain seasons of the year, at least under our tropical conditions. Originally described from material collected on spiraea, in Maine, it was first found in Puerto Rico on grapefruit in 1926. It was the fortunate coincidence of noting its presence on papayas during a routine inspection of our experimental plots, later confirmed for different sections of the island, including the southern coast, which led us to test its vector potentialities. This paper reports the experimental transmission of papaya mosaic by the green citrus aphid (*A. spiraecola* Patch).

TRANSMISSION STUDIES

Aphids, both nymphs or winged forms, were used in the different experiments. They were fed for periods varying from 8 min. to 1 hour on mottled leaves from papaya plants showing early symptoms of the disease and then transferred by means of a camel's hair brush to healthy plants about 3 months old caged in cellulose tube casings (Fig. 1). The number of aphids used for each transmission experiment varied from 6 to 10, but was never less than 6.

Controls were prepared by transferring aphids, handled in the same way, directly from citrus to healthy papaya plants.

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Aphids collected from experimental plants showing definite symptoms of the disease were sent to Dr. P. W. Mason at Washington, who identified them as *A. spiraeicola* Patch.

### RESULTS

Positive transmissions were obtained in 15 out of 33 plants subjected to the action of *A. spiraeicola* Patch fed on diseased papaya leaves for periods of time varying from 8 min. to 1 hour. Both nymphs and winged adults transmitted the disease with equal ease. All controls remained healthy.

The evidence seems to indicate that the aphids are avirulent while on the citrus leaves and that if they are instrumental in the propagation of the disease in the field, they must acquire the virus later during their migration. Further work is still needed to elucidate, among other things, whether *A. spiraeicola* Patch is the only vector involved, when and where it become infectious, modes and seasons of migration to papaya plantations, retention of virus by the insect, etc.

### RESULTADOS

Se ha verificado la transmisión del mosaico o moteado de la papaya en Puerto Rico, a través del áfido conocido por pulgón cítrico verde, *A. spiraeicola* Patch.

Este áfido es el causante de la enfermedad denominada "encaracolado" de las hojas de los cítricos.

Se obtuvieron transmisiones positivas en 15 de 33 plantas sometidas a la acción del áfido *A. spiraeicola* Patch que se alimentó en hojas de papayos enfermos durante períodos de tiempo que variaron de 8 minutos a una hora. Tanto las ninfas como los adultos alados transmitieron la enfermedad con igual facilidad. Todos los testigos sometidos a la acción de los áfidos alimentados en hojas sanas permanecieron libres de la enfermedad.

La evidencia parece indicar que los áfidos adquieren el virus durante el proceso de emigración hacia los papayos. Se hace necesario todavía continuar los experimentos para dejar claramente sentado, entre otras cosas, si el áfido *A. spiraeicola* Patch es el único vector envuelto en la transmisión de la enfermedad, cuándo y dónde llega a ser infeccioso, el modo y la época de emigración a las plantaciones de papayos, la retención del virus por el insecto, etc.



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## LITERATURE CITED

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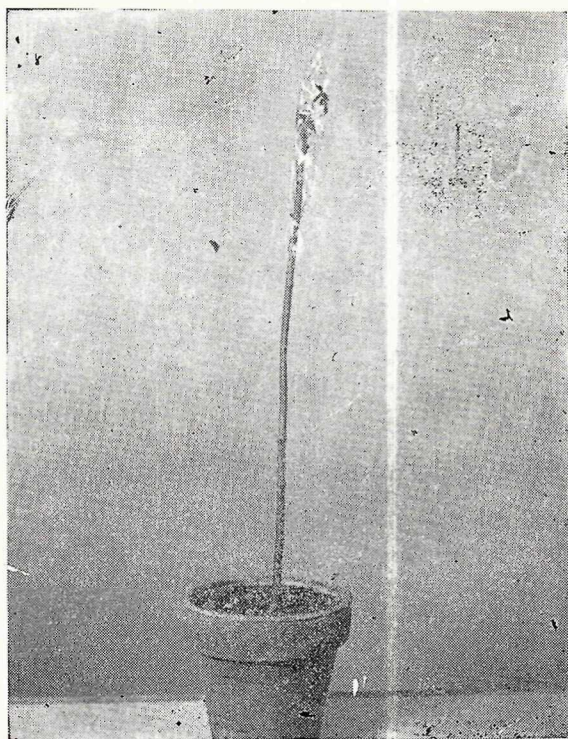


FIG. 1.—Papaya plant illustrating cellulose tube used in the experiments.