TRANSMISSION AND SEROLOGICAL SCREENING OF VIRAL INFECTION IN SWEET POTATO (*IPOMOEA BATATAS* L.) LAM

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Keywords: *Ipomoea batatas*, virus, grafting, aphids, and serology.

Introduction

Sweet potato is one of the world's important food crops, ranking seventh in total production. Although it has been planted in Malaysia for more than 100 years and hundreds of sweet potato varieties are available, there is now an increasing interest in its cultivation in this country (Saad, 1994). According to Moyer and Salazar (1989) virtually all sweet potatoes grown from non-tested materials revealed presence of one or more virus. Skoglund and Smit (1994) reported viruses appear to cause the greatest damage in the field and contribute the most yield losses. Little is known about the identity and properties of virus infecting sweet potato in Malaysia, although symptoms associated to virus infection were more prevalent in the field recently. The objective of this study is to identify the causal agent of the virus disease of three sweet potato cultivars that showed different symptoms through transmission (by grafting and aphids) and serological screening. Finding from this study will be used for antiserum production for viral detection in field and germplasm collection.

Materials and Methods

Virus sources used were from three infected sweet potato cultivars 053K showing chlorotic vein-banding, rugose, slightly folded and twisting symptoms; cultivar 402T leaves showing ringspots and cultivar 470J leaves showing chlorotic spots *Ipomoea setosa* plants, which were about a month old, were cut off about three or four leaves up from the base. A diseased *Ipomoea batatas* cultivar was then cleft grafted to it. A side veneer graft was also made to some plants. *Ipomoea setosa* at two to four leaf stage were also subjected to timed acquisition and inoculation feeding by aphids; *Aphis craccivora* and *A. gossypii*. Symptoms observed on the indicator plants as the results of the two transmission studies were recorded. Two commercial ELISA kits namely Agdia Indirect ELISA and NCM-ELISA tests were used for serological studies.

Results and Discussion

The virus from the three sweet potato cultivars could be transmitted by grafting and insect vectors to *Ipomoea setosa* plants. The symptoms expressed on *Ipomoea setosa* were typical of sweet potato feathery mottle virus (SPFMV), as reported previously in this indicator plant (Clark and Moyer, 1988; Moyer and Salazar, 1989; Moyer and Larsen, 1991). The virus was transmitted in a non-persistent manner to *Ipomoea setosa* plants from the three cultivars by both aphids (*Aphis craccivora* and *Aphis gossypii*). *Aphis gossypii* was more efficient than *Aphis craccivora* in SPFMV transmission. Mean percent transmission for a range of acquisition periods (10, 20, 30, 40, 50 and 60 sec.) was 41.7% for *Aphis gossypii* and 25% for *Aphis craccivora*. Thirty seconds acquisition and inoculation feeding times were found to be optimum for *A. gossypii* to transmit the virus.

Both Agdia Indirect ELISA and NCM-ELISA could detect virus from the three sweet potato cultivars used in these studies. However, NCM-ELISA procedure was more sensitive and reliable in detecting virus in low concentration as compared with Agdia Indirect ELISA method. Since the Agdia Indirect ELISA was specific for aphid transmitted potyvirus group, all three cultivars with different symptoms were infected by a potyvirus group.

Conclusions

Based on the symptoms on the indicator plant *Ipomoea setosa*, the non-persistent manner of transmission by vectors and the positive reactions of both ELISA procedures, it can be concluded that the virus present was sweet potato feathery mottle virus (SPFMV), which belongs to a potyvirus group.

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Supported by IRPA Grant 01-02-04-0175