

DISCUSSION AND PRELIMINARY REPORTS

Cowpea (*Vigna sinensis* Endl.), an Indicator Plant for the Coconut Wilt Virus

In an earlier publication from this institution, Nagaraj and Menon (1) presented evidence that suggested the possible virus origin of the wilt (root) disease of coconut in South India. Shanta and Menon (2) found that cowpea, *Vigna sinensis* Endl., when grown as an intercrop in infected coconut gardens developed malformation and crinkling of leaves, symptoms that were found to be caused by a sap-transmissible virus.

Cowpea seedlings were grown in steam-sterilized soil, and inoculations were done on the two primary leaves of 1-week-old seedlings. Crude sap for mechanical inoculation was prepared by freezing the tender leaves of infected coconut overnight and by extraction in 2.5 volumes of 0.05 M phosphate buffer at pH 8. Of 355 seedlings belonging to five different varieties of cowpea, 255 were infected when inoculated by the abrasion method with leaf sap of diseased coconuts, but none of 260 plants inoculated with leaf sap (extracted by the same method) from healthy seedling or mature coconut plants exhibited any symptoms. Neither did 260 uninoculated seedlings maintained as a further check.

Ten to twelve adults of the reported vector, *Stephanitis typicus* Dist. (1), were liberated on test cowpea plants for 2-3 days after a preliminary feeding period of 24 hours on diseased coconut plants. Of 37 seedlings exposed to the infective insects, 29 showed typical symptoms. However, adults of *S. typicus* were collected from coconuts in the field in Kayangu-lam, a heavily infected tract, and the insects were found to transmit the disease even without a preliminary feeding on diseased material. As breeding of these insects under controlled conditions is still under trial, no attempt was made in these experiments to maintain a control set of plants exposed to insects previously fed on healthy palms.

The characteristic symptoms on infected cowpea plants are malformation and crinkling of the leaves (Fig. 1). Symptoms appear, within 4-12 days after inoculation, as a slight clearing of the veins and veinlets of the tender, still unfurling first trifoliate leaf. This is followed later by similar vein-clearing of the subsequent leaves. Crinkling, malformation, and tearing of the leaves along the veins are also encountered. Many leaves in the later stages of growth show slight yellowing along the margins, the area near the midrib being darker green. The symptoms become masked in plants toward the flowering stage, but many axillary shoots

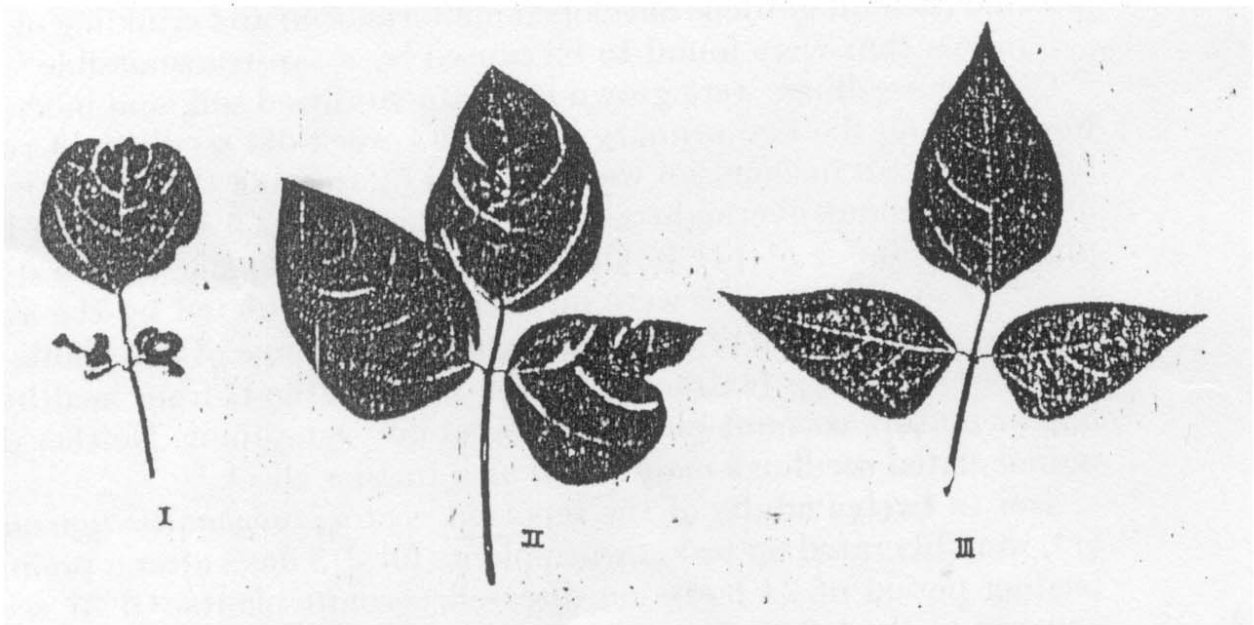


FIG. 1. Infected (I and II) and healthy (III) leaves of cowpea.

in the flush of their growth show typical symptoms. These symptoms are similar to those obtained on cowpea in the field (2).

A culture of this virus has been maintained in cowpea by repeated transfers both by grafting and by mechanical inoculation.

Establishing the disease on coconut under insect-proof conditions is difficult, not only because of the long incubation period of the virus in the host (1), but also because of the difficulty of obtaining virus-free test material since coconut is most susceptible in the prebearing age of 6-10 years. Under such conditions, the present report is of interest in that it supports the earlier work (1) indicating the presence of a virus in wilt-diseased coconuts. Moreover, it shows that cowpea can be used as an indicator plant; it is easy to handle, sensitive to inoculation tests, and in it the virus has only a short incubation period. Further work on the properties of the virus, its vector relationship, etc., is in progress and will be reported in due course.

1. NAGARAJ, A. N., and MENON, K. P. V., *Indian Coconut J.* **9**, 161-165 (1956).
2. SHANTA, P., and MENON, K. P. V., *Indian Coconut J.* **13**, 67-69 (1960).

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