

## Host Range Studies of Groundnut Rosette Virus of Tamil Nadu

By

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### ABSTRACT

Eight out of forty five species of test plants belonging to eleven families of Dicots were susceptible to groundnut rosette virus. The strain of groundnut rosette virus occurring in Tamil Nadu appears to differ from that occurring in Africa.

### INTRODUCTION

Groundnut crop in Tamil Nadu is affected by two types of viroses, namely, rosette and mosaic. The host range of rosette disease which is characterised by stunting of the plants and clustering of axillary shoots was studied and the results are reported in this paper

### MATERIALS AND METHODS

Rosette virus culture obtained in Coimbatore was maintained by using *Aphis craccivora* Koch. as vectors under insect proof glass house conditions. Fortyfive species of plants belonging to eleven families were tested artificially by grafting, by aphid transmission and by sap inoculation under insect proof glass-house conditions. Approach grafting was adopted for graft transmission. In aphid transmission, ten viruliferous *A. craccivora* Koch. were allowed to feed on each test plant for a period of 24 hours. In sap transmission, infective sap was extracted from the young developing leaves of rosette diseased plants separately in 0.2M Sodium borate solution at pH 8.5. The

extracted sap after filtration was rubbed on the carborundum - dusted young leaves of healthy test plants. The test plants were periodically observed for the development of symptoms.

### RESULTS AND DISCUSSION

Eight out of forty five species of test plants were found to be susceptible to rosette virus. The reaction of these eight susceptible hosts are described below.

#### Symptomatology :

1. *Vigna sinensis* Endl. : Light and dark green mosaic mottling symptoms, were seen on the leaves of rosette diseased plants. The leaves and petioles were reduced in size. The internodes were shortened and the plants were stunted. Systemic infection was noticed.

2. *Trifolium pratense* Linn. : Faint mosaic mottling was seen on the youngest leaves, fifteen days after inoculation. The leaves were reduced

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and the plants were stunted. Systemic infection was noticed.

3. *T. repens* Linn.: Systemic infection was observed. Small chlorotic spots were produced on young leaves, twelve days after inoculation. Plants were stunted

4. *Stylosanthes mucronata* Willd.: Small chlorotic specks were seen as initial symptoms which later developed into pale green and dark green patches on the leaves. Leaves were reduced in size. Plants were stunted. Infection was systemic.

5. *Dolichos biflorus* Linn.: Leaves were very much reduced in size and axillary shoots were clustered to give a rosetted appearance. Systemic symptoms were noticed.

6. *Cajanus cajan* (L.) Millsp.: Leaves were smaller and showed chlorotic and necrotic spots. The infection was systemic.

7. *Chenopodium album* Linn.: Few, faint, discrete chlorotic localised lesions were seen on the inoculated leaves. These lesions later turned necrotic.

8. *C. amaranticolor* Coste and Reyn.: Discrete, faint, localised chlorotic lesions were seen on some of the inoculated leaves.

Three out of eight susceptible hosts were cultivated pulse crops, namely, *Vigna sinensis*, *Cajanus cajan* and *Dolichos biflorus*.

The following plants species did not show any visible symptom of infec-

tion. *Pisum sativum* Linn., *Medicago sativa* Linn., *Crotalaria juncea* Linn., *Phaseolus vulgaris* Linn., *P. aureus* Ham, *P. mungo* Linn., *P. lathyroides* Linn., *Cicer arietinum* Linn., *Dolichos lab-lab* Linn., *Peyamopsis psoralioides* DC, *Trigonella foenum graecum* Linn., *Tephrosia tinctoria* Pers., *Glyricidia maculata* H.B. & K., *Sesbania speciosa* Taub. ex. Engl. and *S. aculeata* Poir belonging to *Papilionaceae*, *Nicotiana glutinosa* Linn., *N. tabacum* Linn. var. White Burley, *Datura stramonium* Linn., *Solanum melongena* Linn., *Lycopersicon esculentum* Mill., *Capsicum annuum* Linn., and *Etunia hybrida* Hort. ex. Vilm, belonging to *Solanaceae*; *Beta vulgaris* Linn., belonging to *Chenopodiaceae*; *Tridax procumbens* Linn., *Bidens pilosa* Linn., *Carthamus tinctorius* Linn. of *Compositae*; *Brassica rapa* Linn. of *Cruciferae*; *Daucus carota* Linn., belonging to *Umbelliferae*; *Achyranthes aspera* Linn., and *Gomphrena globosa* Linn. of *Amaranthaceae*; *Cucurbita pepo* DC, *Cucumis sativus* Linn., and *Lagenaria vulgaris* Ser. of *Cucurbitaceae*; *Abelmoschus esculentus* W. & A. and *Abutilon indicum* G. Don. of *Malvaceae*; *Caesalpinia pulcherrima* Swtz. belonging to *Caesalpiniaeeae* and *Euphorbia hirta* Linn. belonging to *Euphorbiaceae*.

Vandervekan (1961) obtained mosaic symptoms on *Centrosema plumieri* and *Petunia nana compacta* but could not retransmit to groundnuts. Okusanya and Watson (1966) found that *Trifolium incarnatum* L. *T. repens* L., *Nicotiana clevelandii* Gray, *N. rustica* L. (all systemic) and *Chenopodium amaranticolor* Coste and Reyn., *C. album* L. and *C. quinoa* Willd. (all

local lesion hosts) were susceptible to several isolates of rosette virus from East and West Africa. In the present study *T. repens* L. *C. album* L. and *C. amaranticolor* Coste and Reyn were found to be susceptible to rosette virus. Bisht, *et al.* (1963) obtained negative results in the transmission of groundnut rosette virus by sap and by grafting on to *Nicotiana tabacum* L. var. White Burley, *N. glutinosa*, *Datura stramonium*, *Phaseolus vulgaris*, *Pisum sativum*, *Vigna sinensis*, *Cyamopsis tetragonoloba*, *Capsicum annum*, *Lycopersicon esculentum* and *Solanum melongena*. This is in confirmity with present findings except for the fact that *Vigna sinensis* was susceptible to the present rosette virus strain. Nutman, *et al.* (1964) were of the opinion that though the cowpeas were not hosts of rosette virus, yet they could provide large numbers of winged aphids early in the season that would increase populations on groundnut.

Adams (1967) found that *Trifolium incarnatum* L. *Stylosanthes sunaica* Taub. *S. guyanensis* Aubl. *S. mucronata* Willd. and *S. juncea* Micheli were susceptible to groundnut rosette virus. *Vigna sinensis* and *Cajanus cajan* and

*Euphorbia hirta* were not found to be the hosts of rosette virus. *T. repens* L. was susceptible to the isolate of rosette virus occurring at Coimbatore in addition to *Vigna sinensis* and *Cajanus cajan*. The results indicate that the strain of rosette virus occurring at Coimbatore may be a different from that occurring in Africa.

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