

A MOSAIC DISEASE OF HORSEGRAM (*DOLICHOS BIFLORUS L.*)²

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A severe disease of horsegram (*Dolichos biflorus L.*) characterised by mosaic mottling was observed at Vellayani. The symptoms of the disease became prominent during May-August and wherever infection occurred early the damage was severe. There are reports of two different viruses causing mosaic disease of horsegram (Capoor and Varma, 1948; Nariani, 1960). Investigations were undertaken to identify the causal virus infecting horsegram in Kerala and the results are presented in this communication.

Materials and Methods

Healthy seeds of horsegram were used for all the trials. Seedlings were raised in earthen pots (15 cm dia.) filled with potting mixture (equal parts of aterite soil and F.Y. M.). The culture of the virus was isolated from naturally infected plants in the held and maintained on horsegram in insect proof house. Whiteflies reared on healthy tobacco plants were used for the transmission studies. Transmission was done by using glass chimneys as the microcages were found to be unsuitable under humid condition. White-fly, *Bemisia tabaci* Gen; were fed on infected horsegram plants to acquire virus. After different acquisition feeding time groups of ten insects were transferred to healthy plants. After an infection feeding period of 24 hours in each case the insects were killed by spraying 0.03% Dimecron-100 E. C. and the plants were kept under insect proof condition. To study the mechanical transmission of the virus, concentrated as well as standard sap (1 g material in 1 ml of sterile distilled water), was used with and without using carborandum as an abrasive. Seeds from naturally and artificially infected plants were collected and tested for the seed borne nature of the virus. Healthy and mosaic affected plants were grafted by inarching.

Results and Discussion

A. Mechanical transmission: Mechanical (Sap) transmission was not successful both in the case of concentrated as well as standard sap.

B. Graft transmission. The virus was readily transmitted and the symptoms were exhibited on the young apical leaves and on leaves of axillary shoots after 25-28 days.

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C. *Seed transmission.* One thousand seeds collected from infected plants were sown in pots. There was 88.4 per cent germination. The plants kept for two months under observation did not develop the symptoms of the disease which indicated that the virus is not seed borne. Uppal (1931) reported 25 per cent of seed transmission in the case of a mosaic disease of *D. biflorus*. But Capoor and Varma (1948) failed to observe seed transmission of the virus. They considered that mosaic virus of horsegram is caused by double bean yellow mosaic virus.

Table 1

Transmission of horsegram mosaic virus by *B. tabaci*

No. of white flies	Acquisition feeding time	Infection feeding time	No of plants inoculated	No of plants infected	Per cent transmission
10	15 minutes	24 hours	8	2	25
	30 "	"	8	1	12.5
	45 "	"	6	1	16.6
	60 "	"	8	3	37.5
	75 "	"	9	3	33.3
	90 "	"	7	2	28.5
	105 "	"	7	2	28.5
"	2 hours	"	14	10	71.4
	4 "	"	14	8	57.1
	6 "	"	8	5	62.5
	"	"	8	4	50.0
	12 "	"	8	7	87.5
	16 "	"	8	5	62.5
	24 "	"	9	8	88.8

D. *Insect transmission.* The studies revealed that the virus could be transmitted by white flies. It was found that the vector acquired the virus with a minimum acquisition feeding time of 15 minutes and the infectivity increased as the acquisition feeding time was increased (Table 1). The incubation period

സംഗ്രഹം

മുതിർച്ചെടിയെ ബാധിക്കുന്ന 'മൊസൈക് വൈറസ്' രോഗം എങ്ങനെ പടർന്നു പിടിക്കുന്നുവെന്ന് പഠന വിധേയമാക്കിയപ്പോൾ, വിത്തിലൂടെയോ ചെടിയുടെ നീർ പുറം ണ്ടോ ഇതു് മറ്റു ചെടികൾക്കുണ്ടാകുന്നില്ലെന്നും എന്നാൽ തൈകൾ ഒട്ടിക്കുന്നതുകൊണ്ടും 'ബെമീസിയ ടബാസി' എന്ന കീടം മുഖേനയും മറ്റു ചെടികളിലേയ്ക്ക് സംക്രമിപ്പിക്കാമെന്നു കണ്ടു.

പയർ വർഗ്ഗത്തിലെ വിവിധ ഇനങ്ങളിലേയ്ക്ക് ഈ രോഗം പകർത്താൻ ശ്രമിച്ചതിൽ "ഐഞ്ചു ബീനി"ലേയ്ക്ക് മാത്രമേ പകർച്ച കണ്ടുള്ളൂ. ലക്ഷണങ്ങൾ കൊണ്ടും പകരാറിലുള്ള മാർഗ്ഗങ്ങൾകൊണ്ടും മുതിരച്ചെടിയിലെ ഈ വൈറസിന് "ഡബിൾ ബീൻ യെല്ലോ മൊസൈക് വൈറസ്"മായി സാധ്യം ഉണ്ടെങ്കിലും രോഗം പിടിപെടാനിടയുള്ള ഇനങ്ങളിലെ വ്യത്യസ്തതകൊണ്ട് ഇതിനെ, "ഡബിൾ ബീൻ യെല്ലോ മൊസൈക് വൈറസിന്റെ" ഭിന്നമായി കണക്കാക്കിയിരിക്കുന്നു.

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