

Research notes

EVALUATION FOR HOST REACTION TO *APHIS CRACCIVORA* Koch IN COWPEA

In Kerala, vegetable cowpea is grown mainly during May-July and September-November. The main constraint in growing cowpea during the above months has been the incidence of aphids (*Aphis craccivora* Koch). This polyphagous aphid sucks the sap from the terminal shoots in the early stages of the plant. At later stage, aphids infest the pods and arrest their growth and cause discolouration. The aphids also act as vectors for many of the legume viruses which reduce the pod yield drastically. Identification of aphid resistant line, if any, would be an appropriate and useful method to control the pest incidence. The released cowpea varieties F 568, C 20, PS 42, NP 1, Barsathi Mutant, Pusa Do Phasli, Pusa Phalguni and Pusa Barsathi are susceptible to aphids (Cheri *et al.*, 1976). Cari *et al.* (1976) identified lines TVU 57, TVU 408 P₂, TVU 1037, TVU 3273 and TVU 4538 to be aphid resistant. The study aims to evaluate the germplasm of cowpeas maintained in the Department of Olericulture, College of Horticulture, Vellanikkara for their relative susceptibility to infestation by the pea aphid.

A. *craccivora*

Field evaluation of 83 cowpea lines was conducted during June-August 1982. The different lines were in single rows with a spacing of 45 cm between rows and 15 cm between plants within a row. The 83 cowpea lines were field tested for resistance to aphids up to 30 days of sowing. After eliminating highly susceptible lines from the first trial, 70 lines were further selected for evaluations during September-December, 1982. The susceptible check 'Kolenchery local' was grown all around the plot and also in alternate rows. Observations on aphid population were recorded at 15 days interval upto 60 days after sowing. Five plants were selected at random from each row and the aphid population present in leaves, internodes and pods were recorded. Based on aphid population, the lines were classified as immune (0), resistant (<100), moderately susceptible (>100 <250), susceptible (>250 <1000) and highly susceptible (>1000).

Based on results obtained in the second field experiment, nine resistant cowpea lines were selected and tested for population build up of aphids in a pot culture experiment providing controlled conditions which are the most suited for the pest. Each line consisting of two plants was raised in pots and when the plants were 25 days old, adult aphids were released at the rate of 50 aphids/plant on terminal portion of plants under cages. Each line was replicated three times. The population build up of aphids in these plants were recorded 15 days after release and expressed as percentage of area infested.

All the cowpea lines except 10 TVU lines were infested by the aphid. In susceptible lines the aphid count in leaves varied from zero in IHR Sel 1 and VS 88 to 1075 in Kolenchery 3. It ranged from zero in V 11, V 25, V 15, V 24, V 29, VN 17, V 10, V 8, V 14 and V 9 to 787 in Mayyanad local in the internodes. The TVU series did not get infested up to 30 days after sowing. The lines TVU 107 and TVU 62 got infested when observed 45 days after sowing (Table 1).

Table 1

Susceptibility of cowpea lines to infestation by the pea aphid in terms of the aphids/plant 45 days after sowing in the TVU lines

Genotypes	Average number of aphids	
	Leaves	Internodes
TVU 207	0.0	0.0
TVU 1889	0.0	0.0
TVU 107	63.0	32.0
TVU 62	0.0	84.6
TVU 408	0.0	0.0
TVU 150	0.0	0.0
TVU 1892	0.0	0.0
TVU 1896	0.0	0.0
TVU 36	0.0	0.0
TVU 2962	0.0	0.0

Table 2

Relative preference measured as aphids/plant 60 days after sowing in the TVU lines

Genotypes	Average number of aphids		
	Leaves	Internodes	Pods
TVU 207	0.0	11.4	0.0
TVU 1889	0.0	0.0	0.0
TVU 107	298	69.2	0.0
TVU 62	0.0	145.0	71.2
TVU 408	0.0	0.0	0.0
TVU 109	0.0	41.2	0.0
TVU 1892	53.0	71.8	0.0
TVU 2896	0.0	0.0	0.0
TVU 2962	0.0	0.0	0.0

Table 3
Area of aphid infestation on top leaves in nine cowpea lines under controlled conditions

Genotypes	Area (cm ²)
TVU 1889	100.00
TVU 2096	108.50
TVU 36	116.00
TVU 408	119.00
TVU 207	129.00
TVU 2962	134.75
TVU 107	139.00
TVU 62	145.00
TVU 109	145.00

The lines TVU 1889, TVU 408, TVU 2896 and TVU 2962 were completely free from aphid infestation on leaves, internodes and pods up to 60 days after sowing. When aphid count was taken 60 days after sowing only the lines TVU 408 and TVU 1889 were observed free from aphids except in the internodes. The remaining TVU lines were susceptible to aphid attack (Table 2). Nine TVU lines were artificially infested by releasing fifty aphids each to caged chambers and observations were made on area of aphid infestation on the lamina. The line TVU 1889 had the minimum area of infestation (100 cm²) while the lines TVU 109 had the maximum area of infestation (145 cm²) (Table 3).

The study indicated TVU 1889 as a source of resistance to *Aphis craccivora* and could be used in breeding programmes.

സംഗ്രഹം

പയറിനങ്ങളുടെ എഫിഡുകളെക്കുറിച്ചുള്ള പ്രതിരോധശക്തി നിർണ്ണയിക്കുന്നതിനു 83 വ്യത്യസ്തയിനങ്ങൾ പരീക്ഷണവിധേയമാക്കിയപ്പോൾ ടി. വി. യു. 1889 എന്ന ഇനത്തിൽ ഈ കീടത്തിന്റെ ആക്രമണം വളരെ കുറവാണെന്നു കണ്ടു. കീട പ്രതിരോധ ശക്തിയുള്ള ഇനങ്ങൾ തയ്യാറാക്കുന്നതിനു ടി. വി. യു. 1889 ഉപയോഗപ്പെടുത്താമെന്നു കാണുകയുണ്ടായി.

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Reference

Chari, M. S., Patel, G. J., Patel, P. N. and Raj, S. 1976. Evaluation of cowpea lines for resistance to aphid *Aphis craccivora* Koch. *Gujarat agric. Uni. Res. J.* 1 (2) 130-132.