

INHERITANCE OF ANGULAR BLACK LEAF SPOT DISEASE RESISTANCE IN MUNGBEAN

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ABSTRACT

Genetics of angular black leaf spot disease was studied in a cross involving resistant X susceptible parents of mungbean. A single dominant gene determines resistance to angular black leaf spot disease in the cross between LGG 450 and PDM 54.

Key words: Angular black spot, resistance, mungbean.

Angular black leaf spot, caused by *Protomyces phaseoli*, is a serious disease of mungbean during kharif season in the North Telangana region of Andhra Pradesh and causes about 30–40% yield losses. Since the chemical control measures of the disease are expensive, there is an urgent need to develop resistant varieties. The transfer of resistance will become possible when information on the sources of resistance and its inheritance becomes available. The present study deals with the inheritance of resistance against this disease. No published information is available on this aspect.

Two mungbean lines, LGG 450 (immune) and PDM 54 (susceptible), and their F₁, F₂, F₃ progenies from direct and reciprocal crosses were grown at the Agricultural Research Station, Warangal, to determine mode of inheritance of resistance to angular black leaf spot disease under field conditions. The spacing between rows and plants were 30 and 10 cm, respectively. Four rows of the susceptible variety Warangal Local was raised as infectors along with the perimeter of the experimental field and disease reaction was recorded on a 1–9 scale. The F₁ and F₂ populations were scored on individual plant basis. The reaction of F₃ progenies was scored on row basis, which were classified as homozygous resistant, segregating or homozygous susceptible. The χ^2 test for the goodness of fit for the genetic ratios was applied.

The F₁s of the direct as well as reciprocal crosses, i.e., LGG 450 x PDM 54 and PDM 54 x LGG 450 were completely free from disease similar to the immune parent LGG 450. Not a single plant of the susceptible parent PDM 54 escaped the disease. The F₂ populations of

both the crosses segregated in good agreement with 3R : 1S, and the F₃ data fitted well to the ratio of 1 homozygous resistant : 2 segregating : 1 homozygous susceptible progenies (Table 1). This indicated that resistance was governed by a single dominant gene for which

Table 1. Inheritance of resistance to angular black leaf spot disease in mungbean

Cross	F ₁	No. of F ₂ plants		χ^2 (3:1)	No. of F ₃ families			χ^2 (1:2:1)
		R	S		R	Segr.	S	
LGG 450 x PDM 54	R	455	155	0.06	51	87	42	1.10
PDM 54 x LGG 450	R	606	210	0.24	40	91	49	0.90

R — resistant, Segr — segregating, and S — susceptible.

gene symbol Ab1 is proposed. This is the first report on the genetics of inheritance of angular black leaf spot disease. Since the resistance is monogenic dominant, it can be easily transferred to promising susceptible genotypes and varieties already in cultivation.