

Screening of Dolichos bean (*Dolichos lablab* L.) genotypes for resistance to anthracnose disease caused by *Colletotrichum lindemuthianum*

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SUMMARY

The experiment conducted to know the reaction of Dolichos bean genotypes to anthracnose (*Colletotrichum lindemuthianum*) under field condition. One hundred ninety five genotypes were screened for identification of resistance to anthracnose, in which nine genotypes viz., GLB 3, GLB 4, GLB 8, GLB 9, GLB 11, GLB 19, GLB 60, GLB 166 and GLB 167 were found immune, 48 genotypes were resistant, 83 genotypes were moderately resistant, 51 genotypes were moderately susceptible and 4 genotypes were susceptible to the anthracnose. The per cent disease severity among the genotypes varied from 0.00 to 26.11 per cent.

Key words :

Dolichos lablab,
Colletotrichum lindemuthianum,
Per cent disease index (PDI)

Dolichos bean (*Dolichos lablab* L.) is growing as a vegetable or pulse for human consumption, or as animal forage or feed and largely grown as a mixed crop with finger millet, groundnut, castor and sorghum and it is also grown as pure crop under rainfed as well as irrigated conditions. Dolichos bean crop is affected by many diseases. Among these, anthracnose caused by *Colletotrichum lindemuthianum* (Sacc. and Magn.) Scriber. is the most devastating disease in India (Sharma and Sugha, 1995).

Colletotrichum lindemuthianum which causes anthracnose of dolichos bean was observed in 1875 by Lindemuth at Popplesdori, Germany (Tiffany and Gilman, 1954). In India, its occurrence was noticed for the first time in Nilgiri hills in 1915 (Sharma *et al.*, 1994). In Himachal Pradesh, India, the incidence of this disease has been reported to range from 5.0 to 65.0 per cent in different locations leading to considerable yield losses in certain years (Ashwani Basandri *et al.*, 1999). Taking into account, the genotypes of dolichos bean were screened under field conditions in randomized block design with three replications to identify the resistant source for anthracnose.

MATERIALS AND METHODS

The field experiment was conducted in Zonal Agricultural Research Station (ZARS),

University of Agricultural Sciences, G.K.V.K., Bangalore during *Kharif* season of 2008-2009. The one hundred ninety five genotypes were sown in Randomized Block Design with three replications. The disease scoring for the anthracnose disease was done at every 30 days intervals by selected five plants in each block. To assess the resistance for anthracnose, symptom severity grades, designated with numerical values 0-5 scales were used as given by Sharma and Kaushal (2000). To quantify the disease severity, calculations were made and per cent disease index (PDI) was calculated.

The per cent disease index (PDI) was calculated by using the formula.

$$PDI = \frac{\text{Sum of all disease ratings}}{\text{No. of leaves examined} \times \text{Max. disease grade}} \times 100$$

The symptom severity grades of 0-5 disease scale were used to assess the resistance as detailed below:

Scale	Disease reaction	Disease severity (%)
0	Immune	0 (Free)
1	Resistant	Up to 5
2	Moderately resistant	6-10
3	Moderately susceptible	11-25
4	Susceptible	26-50
5	Highly susceptible	>50

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Table 1 : Screening of the dolichos bean genotypes against anthracnose

Disease severity grade	Disease reaction	% leaf area covered	Number of genotypes	Genotypes (GLB numbers)
0	Immune	0.00	9	3, 4, 8, 9, 11, 19, 60, 166 and 167
1	Resistant	Up to 5	48	1, 6, 13, 14, 18, 40, 42, 45, 46, 48, 49, 64, 65, 66, 75, 77, 82, 84, 87, 89, 91, 93, 96, 99, 105, 106, 115, 121, 124, 150, 152, 153, 154, 155, 161, 164, 170, 173, 174, 180, 182, 190, 193, 196, 197, 198, 199 and 200
2	Moderately resistant	6-10	82	2, 7, 16, 21, 23, 26, 27, 30, 31, 36, 38, 39, 41, 43, 47, 50, 51, 52, 55, 56, 57, 59, 62, 68, 69, 71, 73, 78, 79, 80, 81, 83, 85, 86, 88, 90, 94, 97, 100, 102, 103, 104, 111, 113, 114, 117, 118, 120, 128, 131, 134, 136, 137, 138, 140, 145, 146, 149, 151, 157, 158, 159, 160, 162, 163, 165, 168, 172, 176, 178, 179, 181, 183, 184, 186, 187, 188, 189, 191, 192, 194, and 195
3	Moderately susceptible	11-25	51	5, 10, 12, 15, 20, 22, 24, 28, 29, 32, 33, 34, 35, 37, 44, 54, 58, 61, 63, 67, 70, 72, 74, 76, 95, 101, 107, 108, 109, 110, 112, 116, 119, 125, 126, 127, 132, 133, 135, 139, 141, 142, 143, 144, 147, 148, 156, 169, 171, 177 and 185
4	Susceptible	26-50	4	25, 122, 129 and 130
5	Highly susceptible	>50	-	None

RESULTS AND DISCUSSION

The results obtained from the present investigation are presented in Table 1.

The observations were recorded on per cent disease index by using 0-5 disease scoring scale as presented in Table 1 which revealed that, nine genotypes *viz.*, GLB 3, GLB 4, GLB 8, GLB 9, GLB 11, GLB 19, GLB 60, GLB 166 and GLB 167 were found immune, 48 genotypes were resistant, 83 genotypes were moderately resistant, 51 genotypes were moderately susceptible and 4 genotypes were susceptible. The nine immune genotypes may be further evaluated and used in breeding programme. Similarly, Sharma and Kaushal (2000) also found that eleven dolichos lines were resistant and 40 lines were moderately resistant. Seventy one lines were found to be moderately susceptible and 73 lines were susceptible to *C. lindemuthianum*.

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