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Short Communication

MULTIPLE DISEASE RESISTANCE IN ADZUKI BEAN

Ashwani K. Basandrai and V.P. Gupta

Department of Plant Breeding and Genetics,
Himachal Pradesh Krishi Vishvavidyalaya,
Palampur 176 062 (Himachal Pradesh)

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Adzuki bean (*Vigna angularis* (Willd.) Ohwi and Ohashi) is a major grain legume in China, Japan and Russia (Sacks, 1977). In India, cultivation of the crop is limited to hilly regions. In Himachal Pradesh, the crop has shown a great potential due to its high productivity and resistance to leaf spot diseases (Gupta *et al.*, 1980). In the absence of a disease resistant variety of Uridbean, an important pulse crop of hills, adzuki bean can boost and stabilise the production of *kharif* pulses especially in disease epidemic years. This crop is sparsely cultivated in some of the remote areas of hills. However, for increased and sustained production, it is desirable to identify agronomically desirable, disease resistant genotypes. This communication reports disease resistant genotypes among local, exotic, and local x exotic derivative lines of *Vigna angularis*.

In one experiment, the material consisted of 30 local and exotic germplasm lines, raised during *kharif* 1989 in RBD in three replications, having a plot size of 3 rows each with 1.5 m length and row to row distance of 30 cm. Fertilizers @ 20 kg N and 40 kg P_2O_5 per hectare were applied at the time of sowing. In another experiment, thirty eight advanced lines derived from a local x exotic cross A 1 x HPU 51 of adzuki bean alongwith their parents grown in pots were also evaluated for resistance to powdery mildew under screen-house conditions (temperature 25 ± 4° C) during *kharif* 1990.

Natural epidemics of powdery mildew (*Sphaerotheca fuligenea*), Cercospora leaf spot (*Cercospora canescens* and *C. cruenta*) and anthracnose (*Colletotrichum lindemuthianum*) appeared in the experimental area. The observations on terminal disease severity of Cercospora leaf spots and powdery mildew were recorded on 0-5 scale as recommended by All India Co-ordinated Pulse Improvement Workshop, 1978 for mung and mash crops (Singh, 1980). The data on anthracnose was recorded on 0-9 scale (Mayees and Datar, 1986).

Genotypes showing resistant or moderately resistant reaction to various diseases are given in Table 1. Two genotypes each (EC 15257, EC 89957) and (EC 108080, EC 87896) were resistant to powdery mildew and leaf spot caused by *C. cruenta*. Four genotypes were resistant to anthracnose, whereas all the genotypes except IC 87897 were resistant to leaf spot caused by *C. canescens*. Genotypes IC 24104 and A 1 were resistant or moderately resistant to powdery mildew, *C. canescens* and anthracnose. Line EC 87897

Table 1 : Genotypes of adzuki bean resistant to powdery mildew, Cercospora leaf spot and anthracnose

Disease	Reaction of genotypes	
	Resistant	Moderately resistant
Powdery mildew	EC 15267, EC 89957	A-1, BDJ/NKG 457, EC 87897, EC 108080, EC 120460, IC 24104, IC 24107, IC 57899.
Cercospora leaf spot (*Cercospora cruenta*)	EC 108080, EC 87896	A-1, BDJ/NKG 1433, EC 16767, EC 29957, EC 87897, EC 87995, EC 89951, EC 108077, IC 15256, IC 24102, IC 24104, IC 24523, IC57899, IC 120460.
Cerospora canescens	All except EC 87897	
Anthracnose	EC 87896, EC108080	Assam local, EC 16767, EC 29957, EC 87898, EC 108077, EC 108080, IC 15256, IC 24102,IC 24104, IC 24523.

was resistant or moderately resistant to powdery mildew and anthracnose, whereas EC 57899 was resistant to powdery mildew and anthracnose. Genotypes EC 108080 and EC 87896 were resistant to *C. cruenta, C. canescens* and anthracnose. Genotypes EC 108077, IC 24104, EC 87896, IC 16767, EC 29957, IC 24523, IC 24102 and IC 15256 were moderately resistant to Cercospora leaf spot and anthracnose. Among the recombinant lines derived from the cross A1 x HPU 51, line HPAB 16 was completely free from powdery mildew, whereas lines HPAB 36, HPAB 21, HPAB 12, HPAB 8, HPAB 30 and HPAB 2 were resistant to powdery mildew.

In the present studies, a large number of genotypes with multiple resistance have been identified which may be utilized in breeding programme for the improvement of the crop. Moreover, desirable disease resistance specifically against leaf spots may be transferred to **mung** and **mash**. By the time agronomically desirable leaf spot resistant variety of **mash** is developed adzukibean can be cultivated on commercial scale to boost the production of *kharif* pulses.

REFERENCES

Gupta, V.P., S.R. Pathik and N.R Kalia. 1980. An appraisal of research achievements for the genetic amelioration of *mash, kulthi, rajmash,* pigeon pea and adzuki bean in Himachal Pradesh during the last five years. All India *kharif* Workshop Conference held at Kanpur, 7-10 April, 1980.

Mayees, C.D. and V.V. Datar. 1986. Phytopathometry. Technical Bulletin-1 (Special Bulletin). Marathawada Agricultural University, Parbhani. 218 p.

Sacks, M. F. 1977. A literature review of *Phaseolus angularis* - Adzukibean. *Econ. Bot.* **31**: 9-15.

Singh, Gurdip. 1980. Screening of breeding material for disease resistance in pulse crops. *In:* Breeding methods for the Improvement of Agricultural Research, New Delhi. K.S. Gill. (Ed). p. 111-124.