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Short Communication

Inheritance of epicotyl colour in pigeonpea [*Cajanus cajan* (L.) Millsp.]

K. B. Wanjari, M. C. Patel and A. N. Patil

Pulses Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola 444 104

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Majority of the pigeonpea [*Cajanus cajan* (L.) Millsp.] accessions in the germplasm are having purple epicotyl colour which is later converted into green or brown stem. The inheritance pattern has been studied by previous workers for green and purple stem pigmentation [1]. However, the report on inheritance of epicotyl colour is lacking. Patil *et al.* [2] isolated such seedling markers for use in hybrid pigeonpea breeding. The present study was undertaken to investigate the inheritance pattern of green epicotyl colour and its linkage relationship with genetic male sterile being used for hybrid pigeonpea seed improvement.

A genotype APGS-1 with green epicotyl was used as male parent with two genetic male sterile lines viz. AKms-2 and AKms-8 based on ms_1 gene [3] which had purple epicotyl. The F_1 and F_2 were grown in the subsequent seasons to study the character's inheritance. Chi-square test of goodness of fit [4] was applied for the expected segregation ratio. In both the crosses, colour of epicotyl in F_1 was purple indicating the dominance of pigmented epicotyl over green. In F_2 generation, segregation ratio of 3 purple : 1 green was observed (Table 1). Thus, green colour of epicotyl in pigeonpea was controlled by single recessive gene. D'cruz *et al.* [5], Naphade *et al.* [1] and Singh and Srivastava [6] reported monogenic recessive inheritance of green stem colour with dominance of purple stem colour.

Table 1. Segregation of epicotyl colour in F_2

Name of crosses	Segregation observed		Chi-square test (3:1)	P-value
	Purple	Green		
Epicotyl colour :				
AKms-2 × APGS-1	434	134	0.6009	0.46
AKms-8 × APGS-1	419	127	0.8815	0.35
Male sterility :	Fertile	Sterile		
AKms-2 × APGS-1	427	141	0.009	0.92
AKms-8 × APGS-1	411	135	0.021	0.89

The male sterility is governed by a single recessive gene was reported earlier [3]. The joint segregation for male sterility characterized by white transluscent anther and epicotyl colour showed independent assortment of the two genes with segregation pattern in dihybrid ratio i.e. 9:3:3:1 (Table 2). Hence, the epicotyl pigmentation is not linked with the male sterility on which present commercial hybrids are established.

The simply inherited dominal epicotyl pigmentation could be used as marker to detect the extent of natural out crossing in green epicotyl genotypes of pigeonpea. It may be useful to take the recessive green epicotyl trait on male sterile female parent and dominant on male in a commercial hybrid pigeonpea which will facilitate the detection of true hybrid seed harvested on the male sterile in a laboratory.

Table 2. Dihybrid segregation in F_2 generation

Name of crosses	Segregation obsrved				Chi-square test (9:3:3:1)	P-value
	Purple		Green			
	Fer-tile	Ste-rile	Fer-tile	Ste-rile		
AKms-2 × APGS-1	325	109	102	32	0.6883	0.87
AKms-8 × APGS-1	315	104	96	31	0.9106	0.82

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