

Short Communication

Genetic Divergence in Moth bean (*Vigna aconitifolia* (Jacq.) Marechal)

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Moth bean is an important drought resistant pulse crop of arid and semi-arid regions of India. It is a multipurpose crop used for food as well as fodder. The crop is presently being cultivated in limited area and its production and productivity is rather limited. The work on the varietal improvement of this crop has been carried out at a very limited scale. To obtain the desirable varieties with good yield potential it is necessary to cross selected parents, having adequate degree of divergence.

During kharif 2001-2002 thirty moth bean genotypes were planted in randomized block design with three replications at Agricultural Research Station, Bikaner. Each genotype was planted at 30 x 10 cm spacing in a single row of 4 m length. The observations were recorded on five randomly selected plants in each row for 12 morphological characters, viz., plant height, peduncle length, number of primary branches per plant, number of pods per plant, number of seeds per pod, number of cluster per plant, pod length, seed yield per plant, biological yield per plant and harvest index. The genetic divergence was estimated using D^2 statistic as suggested by Rao (1952).

The test of significance for multiple measurements using 'V' statistics (16625.25) which utilized wilk's criterion confirmed significant differences among the genotypes for all the observed characters. D^2 analysis of divergence grouped 30 genotypes of moth bean into five clusters (Table 1). This suggests the presence of high degree of divergence in the material studied. Among the clusters, cluster I included 23 genotypes, cluster II included 3 genotypes and cluster III included two genotypes, whereas, cluster IV and V had one genotype each. The random distribution of genotypes was evident from cluster I having maximum genotypes with wide distribution. Kakani *et al.* (2002) also obtained the similar results in moth bean. Viswanatha *et al.* (2002) also found cluster I to be largest and thus having wide distribution in cowpea.

Cluster means (Table 2) indicated that cluster V had highest mean value for seed yield per plant, number of primary branches per plant, peduncle length, number of clusters per plant, number of pods per plant, biological yield per plant and harvest index. Cluster IV had highest mean values for plant height, days to maturity, pod length, seeds per pod and 100-seed weight.

Table 1. Number of clusters along with included genotypes

Cluster	Genotypes
Cluster I	MB-21, RMO-409, MB-106, MB-107, MB-101, MB-12, RMO-173, MB-105, MB-103, RMB-25, MB-113, MB-111, MB-110, RMO-423, MB-109, MB-104, RMO-433, MB-114, MB-3, RMO-423, MB-109, MB-104, RMO-433, MB-114, MB-3, RMO-430, MB-112, RMO-257 and MB-102
Cluster II	MB-19, RMO-225 and FMM-96
Cluster III	MB-108 AND RMB-24
Cluster IV	MB-100
Cluster V	RMO-40

Average intra and inter cluster D^2 values (Table 3) revealed that cluster II showed minimum intra cluster value indicating that genotypes within this cluster were similar. While cluster III showed maximum intra cluster D^2 value followed by cluster I revealing thereby existence of diverse genotypes in these clusters. Minimum inter cluster D^2 value was observed between cluster II and III indicating a close relationship among the genotypes included in these clusters. Maximum inter cluster value was found between cluster I and cluster V and between cluster IV and V,

which indicated that genotypes included in these clusters had maximum divergence. Hence, inter mating between the genotypes included in these different clusters may give high heterotic response and thus better segregants.

It can be concluded from the present study that the genotypes included in the diverse cluster namely I and V or, cluster V and IV hold good promise as parents for obtaining potential hybrids and thereby of creating large variability for those characters in moth bean.

Table 2. Mean values of different clusters

Character/cluster	I	II	III	IV	V
Plant height	12.69	14.26	13.83	19.00	14.47
Days to maturity	70.56	64.77	66.00	71.67	60.33
Primary branches per plant	2.44	2.97	2.63	3.07	3.80
Peduncle length	2.04	2.34	2.65	2.60	3.10
Clusters/plant	10.99	15.82	17.73	19.27	25.53
Pod length	3.66	3.82	3.88	4.67	3.68
Pods/plant	28.60	45.71	32.33	35.47	48.60
Seed/pod	4.53	4.86	4.76	5.97	5.60
100-seed weight	2.86	2.87	2.75	2.90	2.82
Biological yield per plant	29.25	44.15	35.21	46.65	47.88
Harvest index	12.35	13.94	11.68	12.88	14.09
Seed yield per plant	3.55	6.16	3.97	6.03	6.73

Table 3. Average intra and inter cluster distance based on corresponding D^2 .

Character/cluster	I	II	III	IV	V
Cluster I	40.86	80.05	69.69	97.08	214.38
Cluster II	-	22.10	55.42	58.44	80.49
Cluster III	-	-	54.66	80.59	97.12
Cluster IV	-	-	-	0.00	136.05
Cluster V	-	-	-	-	0.00

References

- Kakani, R.K., Sharma, R.C. and Garg, D.K. 2002. Genetic divergence, variability and character association in moth bean. In *National Symposium on Arid Legumes for Food, Nutrition, Security and Promotion of Trade* (Eds. A. Henry, D. Kumar and N.B. Singh), Indian Society of Arid Legumes, CAZRI, Jodhpur.
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