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E: ISSN NO.: 2455-0817 *Remarking An Analisation*

Study of of Genetic diversity in selected accessions of *Canavalia gladiata* using Various Morphometric Traits

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Abstract

The present investigation was carried out to study Morphometric studies in some selected accessions of *Canavalia gladiata* using some important quantitative traits like seed length, seed width, seed thickness, seed hilum length 100 seeds weight, pod length, pod width, and number of seeds per podand analysis of variance (ANOVA), coefficients of genotypic, phenotypic and environmental variance, heritability and genetic advance were studiedusing NYSYS –pc version 2.0. The present investigation showed genetic variability within the Germplasm tested and the selected cultures could be used for crop improvement programme.

Keywords: Genetic Diversity, Morphometric, Hetatibilty, Traits.

Introduction

Canavalia bean is a multipurpose crop and almost all the parts of the plant are of great economic importance but pods and seeds are main source of food and forage. The young pods are extensively utilized in Asia as a green vegetable (Purseglove, 1968). Rajaram and Janardhanan, (1992) reported that tribal people of ancient India have eaten this traditionally but are less popular among the general population. The mature dry beans may be cooked and eaten as food, but requires careful preparation because of the anti-nutritional factors present (Pursglove, 1968).

Seeds of sword bean are main source of proteins and also rich in carbohydrates, various vitamins and nutrients. In Indonesia, the seeds are usually boiled twice, washed in clean water, seed coat removed, soaked in water for 2 days, drained and then fermented for 3 to 4 days.

In India, sword bean has been a popular pulse of poor's and tribal people since ancient times. Fruits of sword bean are consumed by the Indian ethnic/tribal peoples of Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura and Meghalaya (Borthakur, 1996). The Kaddar, Mannan and Muthuvan tribal sects of Kerala state, South India, consume unripe fruits of sword bean *(Radhakrishnanet al. 1996).* Cooked young pods and seeds are known to be consumed by the Palliyar tribal people living in Grizzled Giant Squirrel Wildlife Sanctuary, Srivilliputhur, South-Eastern slopes of Western Ghats, Tamil Nadu, India *(Arinathanet al. 2007).* This species is also used as a cover crop and roasted seeds are ground to prepare a coffee-like drink in Guatemala (*Bressaniet al. 1987*).

Other than its nutritive value Sword bean has role in agriculture as green manure and sometimes this is grown as a cover crop and play important role in environmental protection in agro ecosystems.

Aim of the Study

The present study was aimed at to carry out Study of Genetic diversity in selected accessions of *Canavalia gladiata* using various Morphometric traits**.**

Material and Methods

The field observations for present investigation were taken at RBS College Botanical garden and Research Farm Khandari, Agra which is loated in subtropical zone of Uttar Pradesh at 27.2º North latitude and 77.9º East latitude and 163 meters above mean sea level. The summers are extremely hot and dry. The land preparations and measures toensure moisture conservation were done to rule outsheltering to pests and termites.A plot of size 8.5-3.5 meter square was prepared to accommodate all the twenty two bean genera. All the genotypes were sown in five rows; each containing five accessions with spacing of 45 cm. Plant to plant

distance of 10cm was maintained. Data collected from morphological (quantitative) characters of seeds and pods in *Canavalia gladiata* using *were* subjected to statistical analysis (Steel and Torrie, 1984) to assess the extent of variations for various phenotypic, genotypic & environmental parameters in statistical terms.

Result and Discussion

The observations and data collection was subjected to critical statistical evaluation of quantitative traits of *Canavalia gladiata* under *present* investigation provided very interesting results. It was noticed that Out of 9 parameters scrutinized for all the genotypes viz. seed length, seed width, seed thickness, hilum length, 100 seeds weight, pod length, pod width, pod thickness and seeds per pod, the last parameter, i.e. number of seeds per pod remained insignificant for all the genotypes. Hilum length variability remained almost insignificant but variability for 100 seeds weight was quite significant in two genotypes. Significant variability in pod length was represented by single genotype in each genus, showing thereby greater effect of environment in determining the length of the pod.Significant variability in pod length was represented by single genotype showing thereby greater effect of environment in determining the length of the pod. This was further supported by very less percentage of genetic advance. Such observations were also taken by earlier workers (Kabir & Sen 1987 in *Dolichos*; Vadival*et al*. 1997 in *Canavalia*, *gladiata*. Significantly high correlation between seed thickness and seed width (0.9302) and for pod thickness and pod width (0.9416) reflected positive relationship between these traits which could be valuable during selection of varieties for breeding programmes and significantly low correlation was observed between 100 seeds weight and hilum length (0.1035). These results were in conformity with work of Lal*et al*. (2005), Rai*et al*. (2010) and Singh (2011) in some genotypes of Hyacinth bean. Present study revealed that positively correlated characters should result in correlatedresponse for related traits and this positive correlation among characters show simple and indirect selection criteria in the development of superior varieties.

Conclusion

Present investigation the various morphometric traits revealed significant level of which can be proved significant in improvement in the genotypes of the Sword bean cultivars.

Table No. 1 : Coefficient of Environmental Variance, Genotypic Variance, Phenotypic Variance, Heritability, Mean And Genetic Advances (GA) in *Canavalia gladiata* genotypes

S. No.	Characters	Coefficient of Environmental variance	Coefficient of Genotypic variance	Coefficient of phenotypic variance	Heritability %	Mean	GA (as % of mean)
1	Seed Length	4.59	10.51	11.49	84.00%	23.84	19.88
2	Seed Width	3.41	16.76	17.18	95.65%	15.29	33.85
3	Seed Thickness	4.04	1.18	4.48	4.76%	10.24	0.44
4	Hilum Length	4.84	5.14	7.00	53.33%	17.50	7.69
5	100 seeds Weight	0.20	19.25	19.25	99.99%	188.01	39.65
6	Pod Length	6.36	17.87	18.97	88.75%	174.70	34.68
7	Pod Width	4.79	9.67	10.77	80.32%	33.08	17.83
8	Pod Thickness	8.78	17.78	19.95	80.44%	10.75	33.06
9	Number of seeds per pod	5.91	5.32	7.94	44.73%	8.67	7.34

Table No. 2: Showing the Correlation between the Different Phenotypic Traits of Seeds and Pods in *Canavalia gladiata* genotypes

	Seed Lenth	Seed Width	Seed Thickness	Hilum Length	Weight of 100 Seeds	Pod Length	Pod Width	Pod Thickness	Number of Seeds Per Pod
Seed Lenth	1								
Seed Width	0.867**	1							
Seed Thickness	0.7375**	0.6273**	1						
Hilum Length	0.7204**	0.6311**	0.829**	1					
Weight of 100 Seeds	0.5412**	0.74**	0.2218	0.3799**	1				
Pod Length	0.5622**	0.4432**	0.6869**	0.8686**	0.3408**	1			
Pod Width	0.7409**	0.6898**	0.7943**	0.8934**	0.4989**	0.8461**	1		
Pod Thickness	0.649**	0.6136**	0.6507**	0.8348**	0.3699**	0.7303**	0.8392**	1	
Number of Seeds Per Pod	0.6951**	0.5823**	0.8696**	0.877**	0.2025	0.8648**	0.8413**	0.7782**	1

**. Correlation is significant at the 0.01 level
*. Correlation is significant at the 0.05 level

Rerfrences

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