

DIVERGENCE STUDIES IN INDIAN CLUSTER BEAN (*CYAMOPSIS TETRAGONOLOBA* L. TAUB.) FOR DEVELOPING VARIETY FOR VEGETABLE PURPOSE

Smaranika Mishra*, T.S. Aghora and R. Venugopalan

ICAR-Indian Institute of Horticultural Research
Bangalore 560 089 (Karnataka)
Email: smaranika.mishra@icar.gov.in

Received-06.04.2019, Revised-27.04.2019

Abstract: In a quest for developing improved vegetable type guar, the available germplasm at ICAR- Indian Institute of Horticultural Research, Bangalore collected from different parts of the country were evaluated. Narrow genetic base of the crop due to its self-pollinated nature is a hindrance in getting variability in natural pollination. But, hybridization based on genetic distance is a potential tool to get transgressive segregants. Therefore, this study was formulated to estimate the divergence present in the population and based on their genetic distance the genotypes were classified into 4 different clusters. Inter cluster distance was found maximum between cluster II and IV followed by between cluster I and III and cluster I and II. As the objective is to develop vegetable guar, hybridization between genotypes of cluster I (vegetable guar) and distant genotypes with the desirable trait from different cluster will be advantageous. Direct selection for traits like yield per plant and plant height in cluster I was done to identify the potential parents due to their maximum contribution toward divergence. Based on their genetic distance with desirable genotypes of other clusters which have the supplementary traits missing in cluster I, 11 crosses has been identified which has the potential to bring worthwhile improvement in vegetable guar.

Keywords: Cluster bean, Divergence, Diversity, SAS, Vegetable guar

REFERENCES

- Arunachalam, V., Bandyopadhyay, A., Nigam, S.M. and Gibbons, R.W.** (1984). Heterosis in relation to genetic divergence and specific combiningability in groundnut (*Arachis hypogaea* L.) *Euphytica* 33: 33-39.
- Boghara, M.C., Dhaduk, H.L., Kumar, S., Parekh, Mithil, Patel, J., Nilesh, J. and Sharma, Ramavtar** (2016). Genetic divergence, path analysis and molecular diversity analysis in cluster bean (*Cyamopsis tetragonoloba* L. Taub.) *Industrial Crops and products* 89: 468-477.
- Choudhary, B.R. and Kumhar, S.R.** (2010). Diversity Analysis in Clusterbean [*Cyamopsis tetragonoloba* (L.) Taub.] *Annals of Arid Zone* 49(2): 145-147.
- Cochran, W.G. and Cox, G.M.** (1957). *Experimental Design*. 2nd Edition, John Wiley and Sons, New York, 615 p.
- Gopala, K., Dwivedi, N.K. and Singh, J.P.** (2011). Primitive weedy forms of guar, adak guar: possible missing link in the domestication of guar [*Cyamopsis tetragonoloba* (L.) Taub.] *Genetic Resources and Crop Evolution* 58: 961-966.
- Hymowitz, T.** (1972). The trans-domestication concept as applied to guar. *Economic Botany* 26: 49-60.
- Rencher, A.C.** (1995). *Methods of Multivariate Analysis*, John Wiley and Sons.
- Mishra, S., Sharma, M.K., Singh, Mand and Yadav, S.K.** (2010). Genetic diversity of French bean (bush type) genotypes in North-West Himalayas. *Indian Journal of Plant Genetic Resources* 23(3): 285-287.
- SAS V 9.3** (2012). *Statistical Analysis System, V 9.3*, SAS Institute Inc., Cary NC
- Singh, R.V., Chaudhary, S.P.S., Singh, J. and Singh, N.P.** (2005). Genetic divergence analysis in clusterbean [*Cyamopsis tetragonoloba* (L.) Taub.] *Journal of Arid Legumes* 2: 102-105.
- Ward, J.H.** (1963). Hierarchical grouping to optimize an objective function. *Journal of American Statistical Association* 58: 236-244.

*Corresponding Author