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Stability studies in bitter gourd (*Momordica charantia* L.) under different nutrio environments

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ABSTRACT

Fourteen genotypes in bitter gourd (*Momordica charantia* L.) of diverse origin were evaluated in three nutrio-environments *viz.*, Farm yard manure, vermicompost and recommended dose of inorganic fertilizers under irrigated condition in Karaikal region in order to identify stable genotypes for the three nutrio-environments. From the analysis of variance for stability, it was observed that analysis of genotypes for their stability for environment + (genotype x environment) variance was significant for vine length, fruit weight and yield. For the linear component genotype x environment interaction showed significance for yield and for non-linear components pooled deviation was significant for all the characters. Using the stability parameters as per Eberhart and Russells model, COBgOH 1 and MDU1 were identified as stable genotypes. These genotypes gave high yield and had adaptability for all the three environments under study *viz.*, farm yard manure, vermicompost and recommended dose of inorganic fertilizers.

Key words : Bitter gourd, Stability analysis, Genotype, Environment interaction

Bitter gourd (*Momordica charantia* L.) is a popular fruit vegetable cultivated throughout India during warm season. Though bitter in taste, this vegetable is valued for medicinal properties particularly for the treatment of general fever, malaria and diabetes. The major objective of any plant breeding and selection programme is to develop genotypes which could perform consistently superior in variable environment. Yield stability is one of the important character to assess the adaptability of the genotype for commercial cultivation

Among various environmental factors, different types of manures and fertilizers is one of the criteria, which influence the expression of morphological and yield characters. In bitter gourd breeding programme, it is, therefore, considered important to screen and identify the phenotypically stable genotype which could perform more or less uniformly under different environment conditions. Keeping this in view, the adaptability of bitter gourd genotypes to different nutrio – environment *i.e.* (FYM, Vermicompost and RDF) was studied in order to find the stability of genotypes under various nutrio environments.

MATERIALS AND METHODS

The present investigation comprised of seven varieties (Co.1, MDU.1, Paravai Local, Preethi, Arka Harit, Green Long, White Long) and seven hybrids (CoBgOH 1, MBTH 101, MBTH 102, NS 1026, Reshma, Sadabahar, Vishesh) collected from various Institutes and private seed firms. The experiment was conducted in a randomized block design with three replications at PAJANCOA and RI, Karaikal. The seedlings of each genotypes were planted in three different nutrio environment *i.e.* EI 25 tonnes per hectare of FYM, EII 2.5 tonnes per hectare of Vermicompost and EIII Recommended dose of inorganic fertilizer – 100 g of NPK 6:12:12 per pit as basal) and 10 g of N per pit 30 DAS at a spacing of 2m row to row and 1.5m plant to plant. Observations were recorded for the characters vine length, days to first female flower, node to first female flower, number of female flowers, fruit weight, fruit length, fruit girth, number of fruits and yield. Analysis was done as per statistical procedure and stability was worked as suggested by Eberhart and Russell (1966).

RESULTS AND DISCUSSION

From the pooled analysis of variance, the genotype x environment (GxE) were found to be significant for 9 traits. (Table 1) Therefore, the G x E interaction effect was further partitioned into linear (predictable) and non – linear (unpredictable) components through analysis of variance for stability.(Table 2) E + (G x E) interaction was significant for vine length, fruit weight and yield, when tested against pooled error. The differential effects of environment on genotype were found to be significant for vine length, number of female flower, fruit weight and yield as indicated by high significant environment linear mean square for these traits. The linear component G x E interaction was significant for yield, thus predicting the performance of most of the genotype which appeared to be feasible for these characters. The non - significant G