

Studies on bitter gourd (*Momordica charantia* L.) hybrids under salinity

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ABSTRACT

Eight genetically diverse parents identified through genetic divergence analysis were subjected to full diallel mating. Evaluation of parents along with the resultant fifty six hybrids under saline sodic soil revealed the presence of considerable heterosis for most of the traits. Based on *per se* performance the hybrid combinations IC 85643 x Bikaneer 1, Bikaneer 1 x MDU 1, Bikaneer 1 x Bikaneer 3, Bikaneer 3 x BGS 1, Bikaneer 1 x CO 1 and Bikaneer 3 x Paravai Local could be regarded as the best as they had exhibited significant *per se* performance for yield of fruits per vine as well as leaf sodium: potassium ratio. Significant *sca* effects for yield of fruits per vine and leaf sodium: potassium ratio together could be recorded in the cross combinations MDU 1 x CO 1, MDU 1 x Bikaneer 1, MDU 1 x Paravai Local, IC 85643 x Bikaneer 1, IC 85643 x BGS 1, Bikaneer 3 x Vadipatti Local, Bikaneer 3 x Paravai Local, Vadipatti Local x Paravai Local and CO 1 x MDU 1, indicating the possibilities of exploiting them for simultaneous improvement of yield and saline tolerance. Considering the *per se* performance, *sca* and the standard heterosis, the hybrids Bikaneer 1 x CO 1 (2777.22 g / vine), CO 1 x Bikaneer 1 (1951.78 g / vine), IC 85643 x Bikaneer 3 (1911.55 g / vine), CO 1 x MDU 1 (1840.89 g / vine) and MDU 1 x Vadipatti Local (1804.22 g / vine) were identified as the best ones for fruit yield and other yield components.

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The production and productivity of vegetables in our country had increased tremendously with the advent of hybrid technology. However, the hybrids are capable of expressing their potential only under favourable environment. The restricted scope for enhancing the cultivable area necessitates the use of even marginal or problem soils for cultivation. Increasing salinity of soil has been one of the serious concerns limiting production of vegetables. The identification of species and developing genotypes for growing under salinity thus assumes significance. Cucurbits are a large group of vegetables reported to have a better degree of salt tolerance. Bitter gourd is one of the most nutritive and commercially as well as medicinally important cucurbitaceous vegetables grown for its tubercled, fleshy, unripe fruits throughout India. The present investigation was hence focused on identification of suitable hybrid combinations in bittergourd under salinity.

MATERIALS AND METHODS

The study was taken up at the Pandit Jawaharlal Nehru College of Agriculture and Research Institute, Karaikal, Puducherry (U.T.). The soil of the selected field was sandy loam textured with the saturation extract having a pH of 8.9, EC 4.78 dSm⁻¹ and ESP 20.21 percentage and classified as saline sodic. Eight genetically diverse parents (MDU 1, CO 1, IC 85643, Bikaneer 1, Bikaneer 3, BGS 1, Vadipatti Local and Paravai Local) identified

through genetic divergence analysis were subjected to full diallel mating. The parents along with the resultant fifty six hybrids were evaluated in a randomised block design with three replications. Observations on nine biometric traits *viz.*, days to first female flower appearance, node of first female flower appearance, sex ratio (M/F), fruit length (cm), fruit girth (cm), individual fruit weight (g), number of fruits per vine, yield of fruits per vine (g) and leaf sodium and potassium content were recorded on five randomly selected plants. Heterosis in F1 hybrids was estimated for each trait as suggested by Gowen (1952). The sodium and potassium contents in the leaf samples were determined by using the flame photometry (Stanford and English, 1949).

RESULTS AND DISCUSSION

Scope for heterosis breeding:

Hybridisation to exploit heterosis on commercial basis or for selection of promising recombinants in subsequent generations is the prime objective of heterosis breeding programme. Cross pollinated crops like bitter gourd offers tremendous scope for heterosis breeding owing to its out crossing nature. Heterosis in cross pollinated crop has long been known to offer good potentialities for increased yield. Considerable heterosis over the check was observed for majority of the traits in most of the hybrids evaluated in the present study. The number of hybrid combinations which expressed superiority over the standard check and