



Research Paper

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Recombinant selection in bitter gourd (*Momordica charantia* L.) under salt stress

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ABSTRACT : The involvement of fixable additive gene action in control of various traits could be exploited in recombination breeding. The studies on fifty six hybrid combinations of bitter gourd derived through full diallel mating of eight genetically diverse inbreds under salinity revealed that the hybridisation between poor x poor and poor x good or good x poor combiners had given rise to hybrids with significant *sca* effects. The possible direct and reciprocal combinations that could be obtained from crossing parents with good combining ability for various characters were identified in the present study based on combining ability effect. The hybrids Bikaneer 1 x IC 85643 for yield of fruits per vine and CO 1 x Bikaneer 1, Bikaneer 1 x Bikaneer 3 and Bikaneer 3 x Bikaneer 1 for leaf sodium: potassium ratio had shown non significant *sca* effects with favourable *gca* effects of parents. Such combinations could be better utilised in recombination breeding for the improvement of the respective traits.

KEY WORDS : Bitter gourd, Combining ability, Diallel, Hybrids, Recombinants, Salinity

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Maximising the salt tolerance of crop species is an important component of any long term integrated system for farming in areas affected by salinity. Bitter gourd or balsam pear is one of the extensively grown cucurbitaceous vegetables reported to have salinity tolerance. Bitter gourd is also widely recognised for its hypoglycemic properties. It is grown in an area of 6.76 million hectare (Rai and Pandey, 2007). However, research on crop improvement under stress situation on this important crop is very meagre. Though several high yielding varieties and hybrids have been developed to augment the productivity of this crop, their potential is harnessed only under favourable soil and climatic conditions. The present investigation was, hence, focused on identifying parental combinations for recombination breeding under salt stress.

RESEARCH METHODS

The investigation was taken up at the Pandit Jawaharlal Nehru College of Agriculture and Research Institute, Karaikal of U.T. of Puducherry, located along the East Coast at the tail end of river Cauvery. Eight genetically diverse inbreds of bitter gourd *viz.*, 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 resulting in fifty six hybrid combinations. The estimation of *gca* of parents and *sca* of the fifty six hybrid combinations was done as per the procedures outlined by Griffing (1956). The soil of the experimental plot selected for the study was saline sodic with a pH of 8.9, EC of saturation extract 4.78 dsm-1 and ESP of 20.21 per cent. Observations on fourteen biometric characters *viz.*, days to first male flower appearance, days to first female flower appearance, node of first male flower appearance, node of first female flower appearance, number of male flowers per vine, number of female flowers per vine, sex ratio (M/F), fruit length (cm), fruit girth (cm), individual fruit weight (g), vine length (m), number of primary branches per vine, number of fruits per vine and yield of fruits per vine (g) as well as leaf sodium: potassium content were recorded from five randomly selected plants in each replication. The content of sodium and potassium in the leaf samples were determined by using flame photometer (Stanford and English, 1949) from the neutralised triacid extract as suggested by Jackson (1973).