Half diallel analysis for biochemical and morphological traits in cultivated eggplants (Solanum melongena L.)

ABSTRACT

Eleven morphologically diverse cultivated eggplant accessions were used for hybridization following half diallel mating design to obtain 55 hybrids. Evaluation of hybrids along with the parents was conducted over two locations followed by randomised complete block design with three replications to study gene action and combining ability of 15 morphological and biochemical traits. The analysis of variance indicated highly significant differences among the environments and interaction of genotype and environment, except for fruit length to width ratio. Additive gene effects were significant for the inheritance of these traits and expression of these additive genes were greatly affected by environments. The general combining ability (GCA) was greater than their respective specific combining ability (SCA) for all traits except for fruit yield per plant. High values of GCA and SCA effects for characters of interest were dispersed among different genotypes. From this study it was observed that the best parental line was BT15 based on days to first flowering, total number of fruits per plant, total soluble solids and total phenol content. Besides, the parent BM5 showed good general combining ability effects for fruit yield per plant, fruit length and fruit length to width ratio and the parent BB1 performed good general combining ability for fruit diameter, fruit girth and fruit weight. Besides, other parents showed the best performance for only one trait. On the other hand, the hybrid BT6 × BT15 was reported bearing early flowering with high total phenol content and the hybrid BM9 × BB26 has high fruit yield with high soluble solids. Besides, the hybrid BM9 × BB1 has a high fruit diameter and fruit weight. All other hybrids except for these three (BT6 × BT15, BM9 × BB26 and BM9 × BB1) were shown the best performance for only one trait. Hence, based on the desired trait, the hybrid can be selected for future use after large scale evaluation.