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COMBINING ABILITY IN ROSELLE (*HIBISCUS SABDARIFFA* L. VAR. *ALTISSIMA*)

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ABSTRACT

Combining ability studies in a 10 x 10 F_2 diallel set of roselle indicated that mean sum of squares due to gca as well as sca were significant for six characters, while gca : sca ratio more than unity suggested the prevalence of additive gene effects. The genotype AMV 2 was the best general combiner for economic attributes while the crosses AR 105 x AMV 2 and AMV 2 x CP 510 were the best specific cross combinations.

Key words: Combining ability, gca, sca.

Roselle, gaining importance for allied fibre and paper pulp, has low yield potential. An investigation was carried out using diallel analysis to assess the gene action of various economic characters which aids in identification of parents and cross combinations in the genetic improvement of roselle.

MATERIALS AND METHODS

Ten genotypes of roselle, viz., ER 49, ER 66, AR 76, AR 105, AR 96, AR 98, AR 51, HS 7910, AMV 2 and CP 560 were crossed in all possible combinations except reciprocals. The two parents and 45 F_2s were grown in randomised block design with 3 replications during kharif, 1988, at the Main Research Station, Hebbal, Bangalore. Each strain was grown in 3 rows of 3 m length. Statistical analysis for combining ability was conducted according to Method II, Model I of [1].

RESULTS AND DISCUSSION

The analysis of variance for combining ability indicated that mean sum of squares for gca and sca were significant for all characters except for gca of basal and top

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diameter (Table 1). The gca : sca ratio indicated preponderance of additive gene effects for all the characters except basal diameter, top diameter, days to flowering and green weight. Predominant role of dominance component for basal diameter, top diameter, days to flowering and node number has also been reported earlier [2–4].

Table 1. Analysis of variance (M.S.S.) of combining ability for different characters in a 10 x 10 F_2 diallel cross in roselle

Source	d.f.	Plant height	Basal diameter	Top diameter	Node number	Days to first flowering	Green weight	Reed length	Reed weight
Gca	9	704.0**	0.01	0.004	21.7**	15.9**	642.4**	181.4**	3.39**
Sca	45	299.8**	0.02**	0.006**	18.3**	21.6**	375.4**	192.8**	2.68**
Error	108	127.5	0.01	0.003	9.4	0.8	184.7	124.1	0.94
Gca : sca		2.35 : 1	0.5 : 1	0.67 : 1	1.18 : 1	0.74 : 1	0.73 : 1	2.49 : 1	1.76 : 1

*,** Significant at 5% and 1% levels, respectively.

Based on the per se performances for all the characters, the strain AR 96 was found to be the best parent, followed by CP 560. The estimates of gca effects indicated that AMV 2 was the best general combiner for plant height, number of nodes and reed length, while AR 105 had minimum estimates for green weight and reed length. The said lines would respond well to the selection pressure as they possess additive genes for the economic characters. Among the crosses, AR 105 x AMV 2 followed by AMV 2 x CP 560 were the best specific combiners for plant height, days to flowering, basal diameter, top diameter and number of nodes. The crosses ER 66 x CP 560 and AR 76 x AR 105 were the best specific combiners for reed weight and reed length, respectively. Good specific combiners were identified from the crosses involving parents with high x low or low x low general combining abilities.

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