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HETEROSIS STUDY IN RAGI (*ELEUSINE CORACANE* (L.) GAERTN.)

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Twenty one hybrids were obtained by intercrossing seven parental varieties in all possible combinations in a diallelset without reciprocals and were subjected to heterosis study (Relative heterosis, standard heterosis and heterobeltiosis). The hybrid CO 9 x paiyur 1 for grain yield and earliness and the hybrid DPI 1534 x paiyur 1 for more protein and number of productive tiller were considered to be best.

Keywords : *Eleusine coracane;* Heterosis; Ragi.

Introduction

Finger millet or ragi is extensively cultivated in the tropical and subtropical countries for its grain and fodder although the yield is low. Present investigation was started in order to identify superior hybrid combination in it through heterotic studies.

Materials and Methods

The experimental material consisted of twenty one hybrids (excluding reciprocals) and seven parental lines. The hybrids were obtained by intercrossing seven parental varieties in all possible combinations to make a diallel set of F_1 [P(P-1)/2] without reciprocals. Parents and hybrids were raised in a randomised block design, with three replication in kharif 1993. Various types of heterosis viz., heterosis over mid parent (relative heterosis), heterosis over better parent (heterobeltiosis) and heterosis over standard parent (standard heterosis) were calculated for grain yield, protein content, days to 50 per cent flowering and number of productive tillers.

Results and Discussion

The expression of various heterosis are presented in Table 1. The heterotic vigour for grain yield over mid parental value ranged from 27.73 to 45.54 per cent and over better parent ranged from -30.56 to 31.70 per cent showing the possibilities for exploitation of grain yield as reported by Suresh[1] and Marimuthu[2]. The hybrid CO 9 x paiyur-1 recorded as the highest standard heterosis also showed high level of heterobeltiosis and relative heterosis and can be recommended for high yield purpose.

The heterosis over midparent ranged from -34.40 to 59.66 per cent and, that over better parent ranged from -36.99 to 45.87 showing the possibility of protein improvement by hybridisation. The hybrid DPI-534 x paiyur-1 recorded the highest relative heterosis and highest heterobeltiosis value and is the best for protein contents.

In respect of days to 50 per cent flowering, among the hybrids nine were significantly earlier than their mid parental value. The hybrid CO 9 x paiyur-1 recorded the highest heterobeltiosis (-18.96 per cent).

In number of productive tillers high degree of heterosis upto 45.73 per cent was observed in four hybrids out of

Table 1. Magnitude of Heterosis in the 7 x 7 diallel crosses of Finger millot.

Crosses	Grainyield			Protein content		
	di	dii	diii	di	dii	diii
Co 9/DPI-1534	14.793**	9.292	22.711**	- 17.101**	- 34.905**	2.645
CO 0/Paiyur 1	33.821**	29.488**	45.387**	- 15.721**	- 28.803**	6.481**
Co 9/PR 202	- 19.610**	- 24.003**	- 14.671*	11.908**	- 6.633**	39.638**
Co 9/V-1.538L 148	32.180**	23.303**	38.443**	- 18.908**	- 31.308**	2.733
Co 9/T NAU -5.734511	- 27.730**	- 30.563**	15.402*	4.144**	- 19.251**	20.766**
Co 9/K-7	- 18.770**	30.100**	21.510**	24.289**	10.878**	65.828**
DPI-1534/Paiyurl	10.860*	9.013	14.471*	59.663**	45.874**	50.440**
DPI-1534/PR 202	21.135**	20.230**	22.053**	21.151**	12.257**	12.257**
DPI-1534/VL 148	5.820	3.635	5.208	17.353**	6.827**	11.067**
DPI-1534/TNAU 511	- 5.040	- 12.957*	6.047	19.169**	17.105**	- 0.088
DPI-1534/K-7	21.770**	9.467	11.127	28.095**	10.639**	29.761**
Paivur 1/PR 202	14.830**	12.093	17.705**	19.906**	17.101**	20.767**
Paiyur 1/VL	16.680**	12.406*	18.033**	37.364**	36.810**	42.239**
Paiyur 1/TNAU 511	5.598	- 1.694	19.769**	11.766**	0.513	3.659*
Payur 1/K-7	- 4.686	- 15.590*	- 11.364	- 0.500	- 6.503**	9.656**
PR 202/VL 148	2.713	1.333	1.333	- 4.107**	- 5.937**	- 2.204
PR 202/TNAU 511	16.679**	6.223	29.417**	- 5.125**	- 13.492**	-13.492**
PR 202/K-7	45.542**	31.701**	31.701**	- 24.431**	- 29.999**	-17.901**
VL 148/TNAU 511	18.492**	6.568	29.840**	- 34.406**	28.414**	25.220**
VL 148/K	1.906	- 6.650	- 9.154	- 33.250**	- 36.990**	-26.102**
TNAU 511/K-7	- 16.414**	- 30.430**	- 15.240*	- 10.379**	- 23.721**	-10.537**

Table 1 (Contd...)

Crosses	Days to 50% flowering			No. of productive tillers		
	di	dii	diii	di	dii	diii
Co 9/DPI-1534	-4.568	-4.568	-18.614***	11.693	-4.232	26.573*
CO 9/Paiyur 1	-12.354*	-18.965**	-18.614**	45.738**	35.714**	79.390**
Co 9/PR 202	2.336*	-5.194**	-5.194**	-26.265**	-35.238**	-14.405
Co 9/VL 148	-4.615**	-5.583**	-19.480**	26.245**	11.216	46.993**
Co 9/T NAU11	1.160	6.837**	-5.627**	-24.012**	-33.862**	-12.587
Co 9/K-7	3.045*	3.045	-12.121**	-11.862	-25.502**	-1.538
DPI-1534/Paiyurl	-2.564*	-9.913	-9.523**	-9.560	-17.300	-5.734
DPI-1534/PR 202	-2.803*	-9.956**	-9.956**	14.275	11.118	11.118
DPI-1534/VL 148	11.794**	10.659**	-5.627**	6.198	2.916	3.66
DPI-1534/TNAU 511	5.336**	-2.991*	-1.731	-12.759	-14.285	-16.083
DPI-1534/K-7	9.137**	9.137**	-6.926**	23.493*	21.391	14.685
Paiyur 1/PR 202	-2.159	-4.310	0	-10.457	-15.950	-4.197
Paiyur 1/VL 148	9.647**	0.043	0.086	-8.794	-14.110	-2.097
Paiyur 1/TNAU 511	1.716	1.282	2.597	-18.151*	-23.926*	-13.286
Paiyur 1/K-7	-3.496**	-10.775**	-10.389**	3.100	-12.760	-0.559
PR 202/VL 148	-8.490**	-16.017**	-16.017**	-14.982	-15.277	-14.685
PR 202/TNAU 511	-10.537**	-11.111**	-9.956**	27.208**	25.874*	25.874*
PR 202/K-7	-5.607**	-12.554**	-12.554**	-0.548	-4.895	-4.895
VL 148/TNAU 511	-5.386**	-13.675**	-12.554**	14.084	12.500	13.286
VL 148/K-7	15.384**	14.213**	-2.597	-11.111	-15.277	-14.685
TNAU 511/K-7	7.656**	-0.854	0.432	4.695	1.142	-0.979

twenty one. The hybrid CO 9 x paiyur-1 recorded the highest heterosis over mid as well as better and standard parent. The same results reported by Suresh[1], Marimuthu[2] and Ravi Kumar[3]. This character is associated with grain yield, hence selection for number of productive tillers resulted in a high yield genotype.

References

1. Suresh M 1988, Ph.D.(Ag.) Thesis, Tamil Nadu Agrl. Univ., Coimbatore.
2. Marimuthu M 1993, Ph.D. (Ag.) Thesis, Tamil Nadu Agrl. Univ., Coimbatore.
3. Ravikumar RL 1988, Ph.D. (Ag.) Thesis, U.A.S. Bangalore, India.