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Research Note

Quality Characteristics of some Released Rice (*Oryza sativa* L.) Hybrids and their Parents

Key words: , Rice, Quality, Variability

Consumer acceptance of rice hybrids mainly depends on grain and cooking quality aspects of rice. Knowledge of extent of variation for various physico-chemical traits is a pre-requisite for starting a sound breeding programme for quality improvement.

Eight male sterile lines, 67 maintainers and 103 restorers were evaluated under identical conditions during July-December 2000 and the harvested produce was used for quality analysis during February 2001. Quality analysis was carried out for hulling percentage (HP), milling percentage (MP), head rice recovery (HRR), kernel length (KL), kernel breadth (KB), L/B ratio, kernel length after cooking (KLAC), elongation ratio (ER), water uptake (WU), volume expansion ratio (VER), alkali spreading value (ASV), gel consistency (GC) and amylose content (AC) and the estimates of genotypic and phenotypic coefficients of variation, heritability, genetic advance and genetic advance as percentage of mean were worked out.

Hulling and milling percentages had low genotypic and phenotypic coefficients of variation with high heritability, low genetic advance and low genetic gain indicating the predominance of non-additive gene action (Table 1). Hence, it can be inferred that simple selection would not be effective in improving these traits. Chauhan *et al.* (1992,1995) and Chikkalingaiah *et al*., (1999) also reported low coefficients of variation for these traits. Head rice recovery recorded high heritability (99.11%), high genetic advance (24.95) and high genetic grain as percentage of mean (43.85) indicating that selection would result in improvement of this character. Moderate to high coefficients of variation for this trait in the present study indicated the profound influence of environment. Similar trend was noticed for *rabi* produce also (Table 2). This can be explained as head rice recovery is though genetic, many other factors like grain size, shape, degree of chalkiness., type of equipments used, moisture content etc., effect this trait. However, high heritability with moderate to high genetic gain suggests the predominance of both additive and non-additive gene action. These results are in accordance with those reported by Chauhan *et al*.(1995) and Liao *et al*. (2000)

The grain dimensions *viz*., kernel length and kernel breadth recorded low genotypic and phenotypic coefficients of variation with high heritability, low genetic advance and moderate genetic gain as percentage of mean indicated the preponderance of both additive and non-additive gene action.Water uptake, an important factor that indicates the amount of water and time required for cooking showed high heritability (93.17%) and high genetic advance (97.75) which is in accordance with Juliano *et al*. (1969), Sood (1978), Zaman (1981) and Viraktamath (1987). Gel consistency also showed high heritability (92.89) and high genetic advance (41.28). However, care should be taken during the selection process for improving these traits because from the quality point of view the genotypes should have optimum water uptake and medium to soft gel consistency for desirable texture of cooked rice. High heritability for amylose content obtained in the present study was in accordance with the results of Lalitha and Sreedhar (1999) and Liao *et al*.(2000). In areas where sticky rice is preferred low amylose types are desired whereas in places where non-sticky rice is preferred, medium amylose types are desirable. Therefore, choice of parents to develop hybrids depends primarily on the regional preferences as far as amylose content is considered.

The results indicated that genetic variability for grain and milling traits is rather narrow while cooking and eating quality traits vary to a great extent. The breeders should have the ingenuity to have a perfect balance between various physico-chemical quality traits so as to develop hybrids, which will be acceptable to the consumers.

Table1. Estimates of genotypic and phenotypic coefficients of variation, heritability, genetic advance and genetic advance as percentage of mean for various rice quality characters during *Kharif* - 2000 produce and *rabi* 2000 produce

Character	GCV (%)	PCV (%)	Heritability (%)	Expected GA	GA as % of mean
Hulling (%)	2.78	3.07	82.18	4.02	5.20
	(4.47)	(4.89)	(83.65)	(3.47)	(8.44)
Milling (%)	3.41	3.61	89.17	4.64	6.63
	(6.16)	(6.50)	(89.86)	(8.32)	(12.04)
HRR (%)	12.02	12.33	95.02	14.82	24.13
	(21.88)	(21.48)	(99.11)	(24.95)	(43.85)
K L (mm)	7.53	7.71	95.46	0.89	15.11
	(7.39)	(7.68)	(92.80)	(0.85)	(14.69)
K B (mm)	9.62	10.25	88.21	0.39	18.57
	(9.71)	(9.95)	(95.70)	(0.41)	(19.61)
L/B ratio	13.32	13.90	91.91	0.74	26.14
	(13.29)	(13.54)	(95.87)	(0.74)	(26.75)
KLAC (mm)	8.61	9.01	91.15	1.74	16.92
	(9.55)	(9.87)	(93.69)	(1.94)	(19.05)
ER	6.98	7.66	83.45	0.22	12.64
	(8.18)	(8.75)	(87.31)	(0.27)	(15.73)
WU (ml)	21.81	22.59	93.17	97.75	43.36
	(22.19)	(23.00)	(93.13)	(97.30)	(44.13)
VER	7.48	10.86	47.41	0.56	10.42
	(11.46)	(14.34)	(63.75)	(1.05)	(18.84)
ASV	43.59	44.23	97.12	4.07	88.28
	(43.30)	(43.45)	(99.36)	(4.14)	(88.94)
GC (mm)	32.89	34.13	92.89	41.28	65.31
	(31.52)	(33.18)	(90.25)	(43.60)	(61.69)
AC (%)	12.26	14.26	97.04	7.12	28.93
	(16.70)	(16.73)	(99.69)	(8.28)	(34.36)

GCV : Genotypic coefficient of variation
PCV : Phenotypic coefficient of variation
G A : Genetic advance

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Agricultural Research Station
Tandur - 501 141
Ranga Reddy Dt.

D Shivani
B C Viraktamath
S Sudheer Kumar

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