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## Variation and character association in medium land rice *Oryza sativa* L.

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**Abstract :** Statistical analysis of variance (ANOVA) being the important tool to quantify the degree of variance and its significance of a particular biological trait in relation to other cumulative characters has been specially applied in this present study to record the variation and character association in medium land rice, *Oryza sativa* L. The statistical results are very significant.

**Keywords:** Rice, variation, character association, analysis of variance (ANOVA).

### INTRODUCTION

Rice is the basic staple food for half of the world now and well in the future. More than 90 % of the world's rice is grown and consumed in Asia. The average productivity of rice in India is still low nearly 19q/ha in contrast to nearly 60 q/ha in China (Swaminathan, 1998)<sup>1</sup>. Farmers of the Jharkhand state are mostly grown old traditional cultivars which are very poor yielder. Emphasis should be given to identify the location specific promising lines to enhance grains production. Atline et. al.(2000)<sup>2</sup> have advocated that selection exercised in the subdivided target region will be productive. It is also known that productivity altered with the changes in growing environment. Therefore, present investigation was undertaken to study the genetic variation of yield, yield component and their association in rain fed medium land rice.

### MATERIAL AND METHODS

Twenty one diverse lines of medium land rice including some advance and local cultivars were evaluated in complete randomized block design with three replication

at Gramin Vikas Trust research station, Kanke, Ranchi in three successive year from 2008 to 2011. Each plot constituted of seven rows of 4.5 m length with spacing of 20 x 15 cm between row and plants respectively. Observation on five randomly selected plants in each treatment and replication were recorded on ten metric traits except days to 50% flowering, 1000 grain weight and grain yield which recorded on plot basis. The estimates of co-efficient of phenotypic and genotypic variance, heritability, genetic advance, genetic advance percent of mean and correlation coefficient were determined by using method of Lush (1949)<sup>3</sup> and Miller et.al(1958)<sup>4</sup>.

### RESULT AND DISCUSSION:

The analysis of variance indicated highly significant differences among the genotypes for all the characters studied. Higher phenotypic (PCV) and genotypic coefficient of variation (GCV) were observed for grain yield, no.of spikelets/panicle and plant height which indicated that these traits were less influenced by environment (Table 1). This was also supported by narrow gap between PCV and GCV and high heritable value for these characters. Therefore, traits could be considered effective for further improvement in medium maturity rice. High heritability coupled with high genetic advance as

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percent of mean was observed for plant height, grain yield, 1000 grain weight, no. of grain/panicle, no.of spikelet/panicle, days to 50% flowering and panicle length indicating the predominate role of additive gene effects in the expression of these traits and thus suggested that these characters could be improved by simple phenotypic selection. Similar observation have earlier been reported by Manual and Prasad (1998)<sup>5</sup> for plant height and grain yield in medium maturity rice.

Grain yield was significantly and positively correlated with days to 50% flowering, flage leaf area, panicle length, no.of spikelet/ panicle, no. of grain/ panicle,1000 grain weight and harvest index (Table 2). This suggested that selection on the basis of these components will be more effective in improvement of grain yield. This result was in agreement with the earlier findings of Paramsvam (1988)<sup>6</sup> for panicle length and no. of grain/panicle, Choubey and Richharia (1993)<sup>7</sup>for panicle length, spikelet/ panicle and test weight and Sawant et.al.(1996)<sup>8</sup> for panicle length, no. of grain/ panicle and 1000 grain weight. A significant positive inter-association of days to 50% flowering with no. of spikeletes/panicle; no. of grains/panicle and harvest index was observed. Similarly there was strong association between no. of spikelets/panicle and no. of grain/panicle.

Since days to 50% flowering, panicle length, no. of spikelets and no. of grain/panicle and 1000 grain weight showed high heritability and genetic advance as percent of mean exhibit significant positive correlation with grain yield. Therefore, it could be concluded that selection of genotypes based on these traits could bring about improvement in grain yield in medium land rice.

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**Table : 1.** Estimates of various variability parameters.

Character	Mean	Range	Phenotypic variation	Genotypic variation	PCV	GCV	PCV-GCV	Heritability %	Genetic advance	GA at 5% of mean
Days to 50% flowering	92.65	81.3-119.3	126.91	106.31	12.16	11.13	12.16	83.77	19.44	20.98
Flag leaf area	23.22	14.6-30.8	13.42	9.66	15.78	13.39	2.39	71.98	5.42	23.34
Plant height (cm)	108.78	72.0-126.5	313.50	300.08	16.28	15.92	0.36	95.72	34.91	32.10
No. of panicle/plant	10.04	7.3-12.3	1.15	0.83	12.08	9.10	2.98	56.81	1.42	14.13
Panicle length(cm)	22.49	17.9-26.5	3.34	2.59	8.13	7.16	0.97	77.48	2.92	12.98
No. of spikelets/panicle	115.01	70.5-161.5	434.78	367.10	18.13	16.66	0.25	84.83	36.27	31.53
No. of grain/panicle	97.02	50.3-135.1	348.49	299.32	19.24	17.83	1.41	85.89	33.03	34.04
1000 grain weight(g)	21.81	17.3-27.6	15.60	14.11	18.11	17.22	0.89	90.45	7.36	33.74
Harvest Index	32.04	25.6-39.7	11.54	8.09	10.60	8.88	1.72	70.10	4.91	15.31
Grain yield(q/ha)	20.46	7.5-32.7	31.67	29.98	27.51	26.76	0.75	94.66	10.97	53.62

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Table : 2. Correlation coefficient between different pairs of characters

Characters	Days to 50% flowering	Flag leaf area	Plant height (cm)	No. of panicle/ plant	Panicle length(cm)	No. of spikelets/ panicle	No. of grain/ panicle	1000 grain weight(g)	Harvest Index	Grain yield(q/ha)
Days to 50% flowering	1.000	0.342	0.106	0.215	0.311	0.546*	0.518*	0.153	0.439	0.658**
Flag leaf area		1.000	0.553*	-0.122	0.493	0.578**	-0.597**	-0.036	0.247	0.507*
Plant height (cm)			1.000	-0.434	0.407	0.376	0.449	0.110	-0.127	0.161
No. of panicle/ plant				1.000	-0.224	-0.069	-0.128	-0.264	0.409	0.234
Panicle length(cm)					1.000	0.604**	0.665**	0.251	0.488*	0.556*
No. of spikelets/ panicle						1.000	0.968**	0.139	0.117	0.645**
No. of grain/ panicle							1.000	0.183	0.151	0.690**
1000 grain weight(g)								1.000	0.265	0.469*
Harvest Index									1.000	0.585**
Grain yield(q/ha)										1.000

\* & \*\* significant at 5% and 1% probability level respectively.

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**\*\*BIOSPECTRA\*\***

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