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SHORT COMMUNICATION

Study of Variability Parameters, Correlation and Path Analysis for Quantitative Traits in Rice (*Oryza sativa* L.)

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A study was conducted with 71 rice genotypes to estimate genetic diversity and to study correlation among 8 quantitative characters and their direct effect on seed yield. The experiment was carried out under optimum irrigation conditions in the research farm located at IGKV, Raipur, Chhattishgarh. All the seventy one genotypes were sown in Randomized Block Design (RBD) with two replications. A standard spacing of 15cm X 15cm was adopted for transplanting. Recommended packages of practices were followed during the crop growth period. Significant variations among the genotypes were observed for all the characters. Table 1 showed that the estimated values of PCV were higher than GCV for all the characters studied coefficients indicated the role of environment in expression of character. Phenotypic coefficient of variation was ranged from 7.309 per cent for days to 50% flowering to 26.529 per cent for biological yield while genotypic coefficient of variation was 7.256 per cent for days to 50% flowering to 21.825 per cent biological yield. The differences observed between PCV and GCV indicate the presence of high genetic variability for the traits which may facilitate selection. Similar results were obtained by Veni *et al.* (2013), Sharma and Sharma (2007) and Binse *et al.* (2006). Similar results for root traits were obtained by Fukrei *et. al.* (2011). Highest estimated heritability (broad sense) value was obtained for days to 50% flowering followed by spikelet fertility, biological yield and 100 seed weight. While estimates for heritability was lowest for root pulling resistance and harvest index. The highest genetic advance was obtained for grain yield followed by biological yield.

Table 1. Estimated Genotypic coefficient of variance (GCV), phenotypic coefficient of variance (PCV), heritability (h2) and genetic advance (GA)

	Heritability	GCV	PCV	GA Mean
RPR	38.152	9.542	15.448	12.141
DTF	98.536	7.256	7.309	14.837
PH	45.043	18.748	27.935	25.92
100 SW	81.399	14.167	15.703	26.331
SPF	90.22	10.187	10.725	19.932
BY	83.704	19.13	20.91	36.055
GY	67.683	21.825	26.529	36.989
HI	41.84	10.583	16.361	14.1

Note: RPR= Root Pulling Resistance, DTF =Days to 50% flowering, PH= Plant height, 100 SW= 100 seed weight, SPF= Spikelet fertility, BY= Biological yield, GY= Grain yield and HI= Harvest Index

Table 2. Genotypic correlation and path analysis on grain yield

	Genotypic correlation	Direct effect
RPR	0.805**	0.283
DTF	0.746**	0.031
PH	-0.115	-0.229
100 SW	-0.158	-0.008
SPF	-0.181*	0.034
BY	0.839**	0.609
HI	0.642**	0.335

Residual are 0.00197

High heritability (broad) along with high genetic advance in per cent of mean was observed for biological yield, suggesting the preponderance of additive gene effect and selection may be effective for these characters. This result is in conformity with the reports of Bangar *et al.* (2003). Correlation analysis on genotypic basis revealed that seed yield has significant and positive correlation with Root pulling resistance (0.805), days to 50% flowering (0.746), biological yield (0.839) and harvest index (0.642), This indicates the relative utility of all these traits for selection with respect to grain yield. The observed positive correlation of grain yield with various traits was supported by earlier workers *viz.,* Veni *et.al.* (2013), Ekka. *et. al.* (2011), and Rajeshwari and Nandrajan (2004) for days to 50% flowering. As simple correlation does not provide the true contribution of the characters towards the yield, these genotypic correlations were partitioned into direct and indirect effects through path coefficient analysis. Path-coefficient analysis using grain yield as dependent variable and other characters as independent variables is presented in Table-2. Biological yield exhibited positive direct effect on grain yield followed by harvest index and root pulling resistance, indicating that these traits directly lead to increase in seed yield. Singh *et al.* (2000) also reported similar result. Low residual effect was reported (0.00197) in the study, which indicate the parameters taken for study was sufficient to explain the variability.

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