

Correlation Studies in Rice (*Oryza sativa* L.)

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Abstract

Seventy genotypes of rice (*Oryza sativa* L.) were evaluated during Kharif 2012 to study the nature and extent of correlation among yield and yield attributing characters, days to 50 per cent flowering, days to maturity, number of effective tillers per plant, plant height, panicle length, number of grains per panicle, 1000-grain weight, grain yield per plant, kernel length, kernel breadth and L/B ratio. The results revealed that grain yield per plant to be positively and significantly associated with days to maturity, number of productive tillers per plant, plant height and kernel length indicating importance of these traits as selection criteria in yield improvement programmes.

Keywords : Rice, yield ,yield components, correlation

1. Introduction

To break the yield barriers in rice breeding strategies, attempts are being made. The grain yield is a complex character dependant on many component characters and it responds poorly to the direct selection. For the improvement of grain yield, the knowledge on the association between grain yield and its component characters will

Table 2: Estimation of phenotypic correlation coefficients between yield, yield components and quality characters in 70 rice genotypes

Character	Days to maturity	No. of Effective Tillers per plant	Plant height	Panicle length	No. of grains per panicle	1000 grain weight	Kernel length	Kernel breadth	L/B ratio	Grain yield per plant
Days to 50 per cent flowering	0.5017**	0.1522*	0.2286**	0.2670**	-0.1569*	-0.0637	-0.0056	-0.1460*	0.0998	0.1039
Days to maturity		-0.0792	0.3558**	0.1632*	-0.0278	0.0148	-0.1032	-0.1143	0.0446	0.1383*
No. of effective tillers per plant			-0.1300	-0.1794**	-0.1636*	-0.2821**	-0.0379	-0.0634	0.0554	0.1469*
Plant height				0.4151**	-0.0087	0.1975**	0.0626	0.0088	0.0375	0.1693*
Panicle length					0.0319	0.1170	0.1816**	0.0890	0.0168	-0.0869
No. of grains per panicle						-0.4105**	-0.0180	0.0318	-0.0292	0.0893
1000 grain weight							0.0530	0.3059**	-0.2066**	0.0258
Kernel length								-0.3197**	0.7101**	0.1415*
Kernel breadth									-0.8831**	-0.0908
L/B ratio										0.1232

3. Results and Discussion

In the present study, days to 50 per cent flowering exhibited a positive and significant association with days to maturity (Debchoudhary and Das, 1998), number of effective tillers per plant, plant height (Sawant *et al.*, 1995) and panicle length (Yolanda and Vijendra Das, 1995) indicating a scope for simultaneous improvement of the traits. Similar results were reported by Deepa Sankar *et al.* (2006) and Singh *et al.* (2006). However, negative and significant association was noticed with number of grains per panicle and kernel breadth. Such negative correlations arise primarily from competition for a common possibility, such as nutrient supply. If one component gets advantage over the other, a negative correlation may arise (Adams and Grafius, 1971).

Days to maturity had registered a positive and significant association with plant height (Sawant *et al.*, 1995), panicle length (Singh *et al.*, 1984) and grain yield per plant (Debchoudhary and Das, 1998). However, non-significant associations were observed with number of grains per panicle, 1000-grain weight, kernel length, kernel breadth and L/B ratio.

Negative and significant associations were recorded for number of effective tillers per plant with panicle length, number of grains per panicle and 1000-grain weight. However, it had recorded positive and significant association with grain yield per plant, similar to the results of Deepa Shankar *et al.*, (2006) and Ravindra Babu *et al.* (2012).

Plant height had registered positive and significant associations with panicle length (Mirza *et al.*, 1992; Chaubey and Singh, 1994; Nayak *et al.*, 2001; Kole *et al.*, 2008; Khan *et al.*, 2009; Sadeghi, 2011; Ravindra Babu *et al.*, 2012) and 1000-grain weight. It had also recorded positive and significant association with grain yield per plant (Yadav *et al.*, 2010; Akhtar *et al.*, 2011; Yadav *et al.*, 2011; Seyoum *et al.*, 2012). However, non-significant associations were noticed for the trait with number of grains per panicle, kernel length, kernel breadth and L/B ratio.

Significant negative association was noticed for panicle length with grain yield per plant at genotypic level, while positive and significant association was recorded with kernel length. However, it had recorded non significant association with number of grains per panicle, 1000-grain weight, kernel breadth and L/B ratio.

Number of grains per panicle had exhibited negative and significant association with 1000-grain weight while it had recorded non-significant association with kernel length, kernel breadth, L/B ratio and grain yield per plant. Similar non-significant association of the trait with grain yield per plant was reported earlier by Surek and Beser (2003) and Bagheri *et al.* (2011).

Positive significant association was noticed for 1000-grain weight with kernel breadth, while it registered negative and significant association with L/B ratio. However, non-significant associations were recorded with kernel length and grain yield per plant.

Kernel length showed positive significant with L/B ratio (Nayak *et al.*, 2001 and Nayak and Reddy, 2005) and grain yield per plant, while negative and significant association was recorded with kernel breadth, similar to the findings of Sadeghi (2011). Further, kernel breadth registered negative significant association with L/B ratio, while it showed non-significant association with grain yield per plant. L/B ratio had also recorded non-significant association with grain yield per plant.

A perusal of the results on character associations for grain yield, yield components and quality characters revealed phenotypic and genotypic correlation to be of similar direction and significance. The genotypic correlation values were also in general higher than the phenotypic correlation values indicating the masking effects of environment on these traits (Table 1). Similar results were reported by Rajput *et al.*(1996). Grain yield per plant was observed to be positively and significantly associated with days to maturity, number of effective tillers per plant, plant height and kernel length indicating the importance of these traits as selection criterion in yield enhancement programmes. The results are in line with the findings of Nayak *et al.*, 2001 and Nayak and Reddy, 2005).

4. References

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