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Variability, Heritability And Genetic Advance For Yield And Yield Attributing Traits In Mid Early Genotypes Of rice (*ORYZA SATIVA* L.).

N. Lingaiah, V. Venkanna, C. Cheralu, B. Satish Chandra

Scientist, Regional Agricultural Research Station, Warangal, Telangana State, India

Scientist, Regional Agricultural Research Station, Warangal, Telangana State, India

Principal Scientist, Regional Agricultural Research Station, Warangal, Telangana State, India

Scientist, Regional Agricultural Research Station, Warangal, Telangana State, India

ABSTRACT : Sixty four mid early group genotypes of rice cultivars were evaluated for yield and yield contributing characters to study the genetic variability, heritability and genetic advance. The analysis of variance revealed significant difference among the genotypes for the traits studied indicating that a large amount of variability was present in the material. The magnitude of phenotypic coefficient of variation was higher to genotypic coefficient of variation for all the traits. The highest value of phenotypic and genotypic coefficient of variation was observed for yield followed by test weight. High heritability associated with high genetic advance as per cent of mean was found for the characters plant height, test weight and yield indicating the role of additive gene action in controlling these characters.

KEY WORDS: Rice, Genetic variability, Heritability, Genetic advance

I. INTRODUCTION

The development of an effective plant breeding programme and efficiency of selection largely depends on the magnitude of genetic variability present in the population. Assessment of variability for any trait is pre - requisite for a plant breeder to planning effective breeding programmes. Heritability is an index of the transmission of characters from parents to their offspring and it plays an important role in the selection process in plant breeding. Genetic advance provides information on expected gain resulting from selection of superior individuals. Heritability and genetic advance are important selection parameters which helps in predicting the gain under selection.

II. MATERIALS AND METHODS

The experiment was carried out during *kharif,* 2011 at Regional Agricultural Research Station, Warangal. The material comprised of 64 elite mid early genotypes of rice sown in a simple lattice design with two replications with spacing of 20 X 15 cm. Data were recorded on five randomly selected plants in each entry in each replications for the traits days to 50% flowering, Plant height (cm), Productive tillers/plant, Panicle length (cm), Test weight (g) and yield in kg per plot which converted into kg/ha. The data subjected to INDOSTAT software to estimate Genetic coefficient of variation (%), phenotypic coefficient of variation (%), Heritability (%) (broad sense), Genetic Advance and Genetic Advance as percent of mean. The estimates for variability treated as per the categorization proposed by Siva Subramanian and Madhavamenon (1973) *i.e* Low: less than 10%, Moderate: 10-20% and High: more than 20%. Heritability (Low: less than 30%, Moderate: 30-60% and High: more than 60%) and genetic advance as percent of mean estimates (Low: Less than 10%, Moderate: 10-20% and High: more than 20%) according to criteria proposed by Johnson *et al.*, (1955).

II. RESULTS AND DISCUSSIONS

The analysis of variance revealed significant difference among the genotypes for the traits studied indicating that a large amount of variability was present in the material. The mean, variability estimates *i.e*., Genetic coefficient of variation (%), phenotypic coefficient of variation (%), Heritability (%) (broad sense), Genetic Advance as percent of

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mean are presented in table 1. The magnitude of phenotypic coefficient of variation was higher to genotypic coefficient of variation for all the traits. The magnitude of phenotypic coefficient of variation and genotypic coefficient of variation was moderate for the traits yield and test weight (Roy et al., 2001, Thirumal rao et al., 2014, Basavaraja *et al*., 2013, Singh *et al*., 2014). The high PCV observed for yield and test weight (Venkanna *et al.,* 2014). The high GCV obtained for yield and test weight (Warkad *et al* 2013). Heritability estimates were high for the characters Plant height and Days to 50% flowering. The characters Test weight, Yield and Plant height. In selection programmes heritability estimates along with genetic advance can be useful. The characters, test weight, yield (Vaithiyalingan and Nadarajan) and plant height have high heritability along with genetic advance as percent of mean.

Table 1: Variability, heritability and genetic advance for quantitative traits in rice.

Character	Mean	Genetic coefficient of variation (%)	Phenotypic coefficient of variation (%)	Heritability (%)	Genetic Advance	Genetic Advance as percent of mean
Days to 50% flowering	95.32	6.68	7.03	90.40	12.48	16.79
Plant height	118.75	13.04	13.56	92.50	30.70	33.13
Productive tillers/plant	10.53	5.88	11.47	26.30	0.65	6.22
Panicle length	25.24	7.95	9.03	77.7	3.64	18.51
Test weight	21.41	14.95	17.37	74.10	5.67	33.98
Yield	5485.46	15.02	17.63	72.60	1446.73	33.80

III. CONCLUSION

The characters test weight, yield and plant height are attributable to additive gene effects which indicating that improvement in these characters is possible through hybridization followed by selection with pedigree breeding. The characters productive tillers per plant with low heritability with low genetic advance indicating the character is influenced by environmental effects and selection may not be useful.

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