The Pharma Innovation Journal 2018; 7(10): 393-395

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2018; 7(10): 393-395

www.thepharmajournal.com
Received: 06-08-2018
Accepted: 07-09-2018

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Genetic assessment of variability among local land races of rice (*Oryza sativa*)

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Abstract
The present investigation consists of 18 local land races of rice genotypes provided from local farmers of Patna district. The experiment was conducted in RBD design having three replication during kharif 2012. Unlike high yield yielding races, land races maintained by farmers are endowed with tremendous genetic variability. The study of genetic variability in any crop would help in the genetic improvement of yield and desirable characters. The success of genetic improvement in any character depends on the breeding programme variablity refers to the presence of difference among the individual of plant population.

Keywords: Genetic variability, improvement, local land races

Introduction
The genus Oryza originated at least 130 million years and spread as a wild grass in Gondwanaland, the super continent that eventually to become Asia, Africa, Australia and Antarctica. India is the second largest rice producing country in the world after China. Indica are grown throughout the tropical and subtropical and region japonica varieties are grown throughout the temperature zone. Traditional land races are important reservoirs of valuable traits and need special attention for future conservation. It posses valuable traits viz medicinal properties, aroma, tolerance to drought submergence and other special uses. Land races harbor a great genetic potential for race improvement. Unlike high yielding races land races maintained by farmers are endowed with tremendous genetic variability as they are not subjected to subtle selection over a long period of time in rice breeding a large number of local germplasm including wild varieties have served are reservoirs for many unique genes. The protection and preservation of local rice varieties need to discuss phenomenon of terminal extinction as well as strategies policies for the conservation and assessment of genetic diversity. Need for new gene and genetic diversity in crop species is essential to sustained levels of high productive rice.

The study of genetic variability in any crop would help in the genetic improvement of yield and desirable characters. It will facilitate the identification of proper genotype for a particular agro-genotype for a particular agro-climate zone. Whereas genetic variability (GCV and PCV) helps to choose the potential genotypes. The use of correlation coefficient is to eastablish the extent of association between yield and yield component and other character, which are having decisive role in influencing the yield. The success of breeding programme depends upon the quantum of genetic variability available for exploitation and extent to which the desirable characters are heritable. The existence of variability is essential for improving of genetic material. Selection is also effective when there is significant amount of genetic variability. Evaluation of Local Land Races for Yield and Component Traits in Rice (*Oryza sativa* L.) Suited to Eastern & nbsp; Zone of Uttar Pradesh was undertake to investigate the genetic variability, heritability, genetic advance and association between grain yield and yield releated traits as a basic for selection of high yeild rice genotypes in Aerobics system, in a set of set 30 rice genotypes with the following objectives.

1. Evaluation of local land races for yield and yield attributing characters.
2. To access genetic variability among 18 local land races.
3. Identification of early mature rice genotypes suited to Allahabad agro-climatic condition.

Material and Methods
Eighteen genotypes were grown in Randomized block design Kharif 2012.the experinment was conducted at the field centre, department of Genetics and plant breeding, Sam

Higginbottom Institute of Agriculture, technology and science deemed university, Allahabad. Each entry was sown in 5 rows plot of 5m length with 20cm row spacing. Five plants from each replication were selected at random and observation were recorded on 13 characters viz, days to 50% flowering, plant height (cm), number of tillers per plant, panicles per plant, panicle length (cm), number of spikelets per panicles, flag leaf length (cm) flag leaf width (cm), days to maturity, biological yield per plant (g), seed yield per test weight (g) was computed on plot basis. The phenotype, genotypic coefficient of variability (PCV, GCV), broad sense heritability, and genetic advance as of mean at 5% selection intensity where computed by using formulae suggested by Johnson *et al*. (1995).

Results and Discussion

Variability can be observed through biometric parameters like PCV, GCV, heritability (broadsense) and genetic advance. The analysis of variance for different characters was revealed significant differences among all the 13 characters studied indicating the presence of considerable amount of variability. Days to 50% flowering varied from 74.00 (panna manshuri) to 89.00(NDR-359). Plant height varied from 132.00cm (NDR-359) to 134.73cm (Rupali). Flag leaf length varied from 30.86cm (sangam) to 40.33cm (chandan) while flag leaf width varied from 1.05cm (sangam) to 1.45cm (chandan). Number of tillers per plant varied from 6.86(Rajendra manshuri) to 9.53 (chandan), panicle length varied from 24.00cm (Narendra) to 25.46cm (Ganga kaveri). Days to maturity varied from 104.33 (Rajendra manshuri) to 106.33(panna maushuri).Number of spikelet's per panicle varies from 227.33cm (Krishna) to 233.33cm (NDR-359). Number of panicles per hill varied from 7.30cm (Rupali) to 10.30cm (Sangam).Biological yield per hill (g) varied from 30.47g (Lal Sita) to 34.17g (Rupali). Harvest index varied from 30.70 (Ganga Kaveri) to 38.44 (Lal Sita). Mean value of test weight (g) varied from 20.60g (Kranti) to 23.86g (NDR-359). Seed yield per plant varied from 10.31g (Ganga Kaveri) to 12.72g (Basmati). In general, estimation of phenotypic coefficient of variation were higher than corresponding genotypic coefficient of variability.

Table 1: Estimation of Genotypes coefficient of variation and phenotypic coefficient of variation for thirteen characters under study in rice (*Oryza sativa* L)

S. No.	Characters	VG	VP	GCV%
1	Days to 50% Flowering	11.4	11.58	4.39
2	Plant height	0.29	0.82	0.4
3	Flag leaf length	5.35	8.6	6.35
4	Flag leaf width	0.02	0.02	9.74
5	No. of tiller/plant	0.5	0.93	8.68
6	Panicle length	0.13	0.35	1.45
7	Days to maturity	0.23	0.64	0.46
8	No of spikelets/panicle	1.57	3.65	0.55
9	No of Panicles/hill	7.5	7.51	10.2
10	Biological yield	0.56	1.27	2.28
11	Harvest index	3.81	5.66	5.63
12	Test weight	0.45	1.19	3.06
13	seed yield/plant	0.27	0.71	4.48

Table 2: Estimates of heritability, genetic advance and genetic advance as percentage over mean.

				GA as % of mean
S. No.	Characters	h2 (bs)%	GS 5%	5%
1	Days to 50% Flowering	95	6.68	8.83
2	Plant height	35	0.65	0.49
3	Flag leaf length	62	3.76	10.32
4	Flag leaf width	87	0.25	18.69
5	No. of tiller/plant	54	1.07	13.09
6	Panicle length	36	0.44	1.8
7	Days to maturity	36	0.6	0.57
8	No of spikelets/panicle	43	1.69	0.74
9	No of Panicles/hill	89	5.49	48.78
10	Biological yield	44	1.02	3.08
11	Harvest index	67	3.3	9.52
12	Test weight	38	0.86	3.89
13	seed yield/plant	38	0.65	5.66

Conclusion

The present study concluded that there was adequate genetic variability present in the material studied and on the basis of mean performance the genotype Sangam was identified as best genotype for seed yield. Number of tillers per plant, Flag leaf width, number of panicles per hill and seed yield per plant showed high GCV and PCV. Days to 50% flowering, number of panicles per hill, flag leaf width and harvest index depicted high heritability and genetic advance, therefore these characters should be given priority during selection.

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