recorded in characters *viz.*- pod weight, pod breadth, number of pods/peduncle and number of pods/plant. These characters also recorded high values of GCV and PCV which indicated that these characters could be improved through individual plant selection. The above results are in agreement with the findings of Baswana *et al.* (1980) who reported high values of GCV, heritability and genetic advance for pod weight, pod width and number of pods per cluster and Rathnaiah (1985) who reported the same trend for number of pods/plant in dolichos bean.

The high genetic variability and heritability along with genetic advance expressed by the above mentioned four characters indicated that the genotypes could be evaluated in multilocational trials and selected as donors for these traits and used as parents in hybridisation programme.

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Collection, Characterization and Evaluation of Rice Germplasm from Bastar Region

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Landraces have low yielding capacity but possess high yield stability which is important for subsistence farming. Genetic diversity probably serves as an insurance against crop failure. The landraces may be regarded as natural composite varieties that have an array of resistant genes and are well buffered so that no single race or biotype of plant pest can attack at an epidemic level. Systematic study and characterization of germplasm is of great importance for current and future agronomic and genetic improvement of the rice crop. There is a need to extensively collect, exploit and evaluate hitherto untapped genetic productivity of the germplasm. Under NATP project on Plant Biodiversity, an attempt was made to undertake survey and collection of paddy germplasm in Bastar area of Dandakaranya region (Chhattisgarh) and further to characterize and identify variability available in the collection. The collection involved 123 native cultivars and landraces some of which are under cultivation by tribal community of Bastar area. The collection was made from two blocks involving 21 villages and 71 farmer's fields. The materials were grown during wet season, 2000 at DRR Experimental Farm in three rows of 1.5 m long and 30 cm apart. Standard agronomic practices were followed and the seed was harvested at 14% moisture content. Cultivars were characterized using morpho-agronomic descriptors (IRRI, 1996). Data were recorded on 11 morphological traits and 9 agronomic features. Statistical analyses were done to estimate the frequency distribution for agro-morphological characters, variability and correlation among agronomic traits of germplasm.

Frequency distribution for 11 morphological characters (discontinuous variables) are presented in Table 1. A majority of cultivars were found to possess green basal leaf sheath (65%), green leaf blade (38%), light green collar (60%), white ligule (85%), light green auricle (59%), straw coloured apiculus (57%), white stigma (57%). Plant habit included erect (54%), semi

spreading (30%) and spreading (16%) types. Cultivars were classified into moderately exerted (79%), and well exerted (21%) on the basis of panicle exertion. Open type panicle and horizontal flag leaf are other traits that were encountered in large number of varieties. Frequency distribution for 9 continuous variable descriptors are presented in Table 2. Dominant group included varieties in mid early groups with 105-125 day maturity duration; semi dwarf plants; 30-40 cm leaf length, 0.05 leaf width, 25-30 cm panicle length, 10-20 tillers; 10-20 panicles; 100-150 filled grains/ panicle and 2-3 grams of 100-grain weight. Variability parameters of 9 agronomic features are given in Table 3. Maturity data was variable with a difference of 103-150 days between the earliest and the latest maturing accessions. Plant height varied widely from 64 to 123 cm. HMT Super and Sonam were the shortest, while Dadamali was the tallest cultivar. Variability was pronounced in leaf length (22-56 cm). Culm number ranged between 7-32 while the effective tillers were in the range of 3-26. A maximum of 325 fertile grains/ panicle and 3.4 gms of 100-grain weight were recorded in the collection. Occurrence of such desirable features in this germplasm collection and variability encountered would help in exploitation and development of agronomically superior genotypes. Evaluation of these accessions against various bio-constraints is in progress at various hot spot centres across the country.

Phenotype correlation among the agronomic characters are given in Table 4. Positive and significant association were established between leaf length and maturity (0.304**), plant height (0.424**) or leaf width

Table 1. Frequency distribution for morphological characters in rice germplasm

Character	Code	Frequency
Basal leaf sheath color	1	80
	2	43
	3	0
Leaf blade color	1	43
	2	47
	3	31
	4	2
Collar color	1	74
		14
	2	
	3	35
Ligule color	1	85
	2	13
	3	25
Auricle color	1	73
	2	14
Apiculus color	1	47
	2	70
	3	6
Stigma color	1	70
	2	53
Plant type	1	19
	2	37
	3	67
Panicle type	1	3
	2	23
	3	97
Panicle exertion	1	3
	2	23
	3	97
Flag leaf	1	73
	2	48
	3	2
	3	2

Table 2. Frequency distribution for agronomic characters in germplasm collection

Character	Class	Frequency
Days to Maturity	0-105	7
	105-125	102
	125-140	10
	140 and above	4
Plant height	50-100	77
	100-150	46
Leaf length	20-30	21
	30-40	83
	40-50	17
	50-60	2
Leaf width	0-0.5	122
	0.5-1	1
Panicle length	15-20	3
	20-25	16
	25-30	86
	30-35	17
Culm number	0-10	20
	10-20	96
	20-30	6
	30-40	1
Panicle number	10-20	98
	20-30	23
	30-40	2
Grain/panicle	0-50	2
	50-100	35
	100-150	60
	150-200	18
	200-250	3
	250-300	4
	300-350	1
100-grain weight	0-1	5
	1-2	51
	2-3	63
	3-4	2

Table 3. Variability parameters for agronomic characters in germplasm collection

	Mat	Ht	LL	LW	PnL	CmN	PnN	G/P	GW
Minimum	73	64	22	0.5	13.5	7	3	48.33	0.9
Maximum	120	123	56	1.1	35.5	32	26	325	3.4
Mean	88.69	96.46	34.89	0.86	22.77	14.22	8.50	125.57	2.05
STD	8.32	9.62	5.58	0.09	2.97	4.18	3.79	48.58	0.48
Skewness	1.27	-1.16	0.51	-0.12	0.07	1.49	1.58	1.45	-0.32
Kurtosis	3.38	2.39	1.68	0.92	3.05	3.61	3.92	3.03	0.28
CV%	9.38	9.97	15.98	10.79	13.06	29.41	44.66	38.69	23.26

Mat: Days to maturity; Ht: Plant Height (cm); LL: Leaf length; LW: Leaf width; PnL: Panicle length; CmN: Culm number; PnN: Panicle number; G/P: Grains/panicle; GW: 100-grain weight.

Table 4. Phenotypic correlations among agronomic characters of germplasm collection

	Mat	Ht	LL	LW
PnL	CmN	PnN	G/P	GW
Mat	-			
Ht	0.146	-		
LL	0.304**	424**	-	
LW	0.114	0.246**	0.253**	-
PnL	0.069	0.144	0.136	-0.031
-				
CmN	-0.104	-0.231	-0.235**	-0.195*
-0.056	-			
PnN	-0.241**	-0.385**	-0.386**	-0.216*
-0.100	0.696**	-		
G/P	-0.017	0.029	-0.125	0.0004
0.051	0.041	0.156	-	
GW	-0.054	0.129	0.142	-0.037
-0.008	0.121	0.042	0.0002	-

Mat: days to maturity; Ht: Plant Height (cm); LL: Leaf length; LW: Leaf width; PnL: Panicle length;
CmN: Culm number; PnN: Panicle number; G/P: Grains per panicle; GW: 100-grain weight.

(0.253**) between leaf width and plant height (0.246**). Conversely, negative and significant associations were found between culm number and leaf length (-0.235**) or leaf width (-0.195*), panicle number with leaf length (-0.386**), plant height (-0.385**), maturity (-0.241**) or leaf width (-0.216**). The study suggests that tall plants result in few panicles but higher leaf length, leaf width, late maturing cultivars manifest higher leaf length but fewer panicles. Shorter leaf length and smaller leaf width in the study is indicative of higher culm and panicle number which is a very important clue to derive productive selections for higher yields.

Identification and description of the genetic variability in germplasm collection would help in exploitation of useful traits in plant breeding and genetic improvement of rice.

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Pollination Management Perspectives of Berseem Crop – Chicory Weed Association

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Key Words: ***Trifolium alexandrinum*, Berseem, *Cichorium intybus*, Pollination**

Aspects of current agricultural production have been under serious review with a philosophical shift to sustainable agriculture. Productivity of the crop plants is greatly reduced by failure to achieve full reproductive capacity (Punjab Singh, 1988). Seed yield in sexually reproducing plants is linked to the success of pollination and fertilization processes, that in turn, depend on the adaptation of the crop to the area in which it is grown, the availability of effective pollen vectors and the molecular interaction of pollen-pistil