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Morphological characterization of aromatic short grain rices of eastern Uttar Pradesh

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Abstract

Twenty two local land races of eastern Pradesh were agro morphologically characterized using IRRI Descriptors for rice *Oryza Sativa* L. during kharif 2015. Wide range of variation was recorded for Leaf blade Pubescence, Flag leaf angle, Ligule colour, Panicle type, Lemma and Palea Colour & Lemma and Palea Pubescence. Leaf blade Pubescence was varied from glabrous to intermediate among the tested genotypes. It was found glabrous in 11 genotypes and intermediate in 6 genotypes while it was pubescent in 3 genotypes. Variation was also observed for Flag leaf angle. It was found erect in 17 genotypes, and intermediate in 3 genotypes. Leaf auricles were present in all twenty five genotypes. It was recorded light green in colour in all the tested genotypes. Awn was found only in two genotypes Lemma and Palea colour also varied with genotypes. On the basis of morphological characterization it was concluded that these varieties possess distinct and distinguishable morphological characteristics can be registered for their protection under the PPV&FR Act, 2001.

Keywords: Genotypes, Leaf blade Pubescence, Ligule, Panicle, DUS

1. Introduction

Rice is the prominent cereal crop of Uttar Pradesh. Area under rice production in the state is about 5.9 mha covering all ecologies viz. irrigated, rainfed upland, rainfed low land and flood prone including deepwater, floating rices areas, boro rice and problem soils especially usar conditions. Due to varied socio economic and ecological conditions farmers of the eastern part of the Uttar Pradesh grown different varieties suited their local conditions. Large genetic diversity was observed in this area. Eastern Uttar Pradesh is rich in rice genetic resources with hundred of local varieties covering upland to rainfed low land and flood prone ecologies Major factors including adaptation to edaphic & topographic conditions and varying water regime contribute to genetic diversification and ecological specialization. This natural gene bank is under threat due to wide adaptation of high yielding varieties and hybrids. Local land races posses different important traits viz. drought resistant, submergence tolerance, grain quality, Aroma etc. Novelty, distinctness, uniformity and stability are the basic mandate for the registration/patenting of germplasm/varieties under Protection of Plant Varieties and Farmers' Rights Act (PPVFRA) (Anonymous, 2001) [1]. The morphological characterization of the traditional varieties and landraces will be helpful in the assessment of genetic diversity and development of the genetic database. This genetic data base will be helpful to breeder in development of new varieties. International Union for the Protection of New Varieties of Plants (UPOV), is responsible for providing Guidelines for testing of varieties for distinctness. In view of the above observations local landraces (aromatic short grain rices) of eastern Uttar Pradesh were collected and morphologically characterized.

2. Materials and methods

Twenty local land races of short grain aromatic rice varieties were collected from different districts of the eastern Uttar Pradesh. A field experiment was conducted at Crop Research Station, Masodh (NDUAT), Faizabad during kharif 2015 to morphologically characterize these precious germplasms. The germplasms were grown in randomized block design (RBD) with three replications. Observations pertaining to 20 morphological traits viz. Leaf length, Leaf width, Leaf blade pubescence, Leaf blade colour, Basal leaf sheath colour, Flag leaf angle, Ligule colour, Ligule shape, Collor colour, Auricle colour, Culm angle, Panicle type, Secondary branching of panicle, Panicle axis, Panicle exertion, Panicle threashability, Awning, Awn colour, Apiculus colour, Stigma colour, Lemma and Palea colour, Lemma and Palea Pubescence and sterile lemma colour were recorded at different growth stages following IRRI descriptors.

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3. Result & discussion

Morphological traits are prominent markers in the identification of rice varieties since they are less influenced by environmental factors. Inheritance and linkage of morphological characteristics was critically reviewed by Raut (2003) [4]. Data on twenty major morphological traits were recorded for the characterization of 20 short grain aromatic rice varieties (Table 3). Frequency distribution of morphological traits presented in table - 2 shows that among tested germplasm no variation was observed for basal leaf sheath color, ligule color, ligule shape, collar color, auricle color, Secondary branching of panicle, Panicle Exertion, Panicle threshability and stigma color. Wide range of variation was recorded for Leaf blade Pubescence, Flag leaf angle, Ligule colour, Panicle type, Lemma and Palea Colour & Lemma and Palea Pubescence. Leaf blade Pubescence was varied from glabrous to intermediate among the tested genotypes. It was found glabrous in 11 genotypes and intermediate in 6 genotypes while it was pubescent in 3 genotypes. Variation was also observed for Flag leaf angle. It was found erect in 17 genotypes, and intermediate in 3

genotypes. Leaf auricles were present in all twenty five genotypes (Subba Rao, 2013) [7]. It was recorded light green in colour in all the tested genotypes. Awn was found only in two genotypes Lemma and Palea colour also varied with genotypes.

Results of this study will be helpful to the breeder, researchers and farmers in conservation of these priceless genotypes.

Table 1: List of aromatic short grain rice varieties/landraces used for morphological characterization

S. No.	Landraces/Variety	S. No.	Landraces/Variety
1	Gopalbhog	11	Mahi Sugandha
2	Badshahbhog	12	Durbraj
3	Chini Kapoor	13	Lalmati
4	Tulsi Amrit	14	Sakkar Chini
5	Jheena Sambha	15	Nanchuiya
6	Pampudi Basmati	116	Badshah Pasand
7	Kalajeera	17	Jeera Batti
8	Chini Kamani	18	Juhi Bengal - Azamgarh
9	Dhuriawa	19	Kanakjeer
10	Jeera Sanna	20	Juhi Bengal (Mau)

Table 2: Frequency distribution of morphological characters

S.N.	Characters	Frequency distributions
1.	Leaf blade Pubescence	Glabrous-14, Intermediate-6,
2.	Leaf blade colour	Light green-10, Green-10
3.	Basal Leaf sheath colour	Green-20
4.	Flag Leaf Angle	Erect-17, Intermediate-3
5.	Ligule colour	White-20
6.	Ligule shape	Cleft-20
7.	Collor colour	Light green-20
8.	Auricle colour	Lightgreen-20
9.	Culm Angle	Erect-17, Open-3
10.	Panicle type	Compact-5, Intermediate-15
11.	Secondary branching of panicle	Light-20
12.	Panicle Axis	Straight -3, Droopy - 17
13.	Panicle Exertion	Well exerted-20
14.	Panicle threshability	Moderately difficult-20
15.	Awning	Absent-18, Long and fully awned-2
16.	Awn colour	Awnless-18, Straw-2
17.	Apiculus colour	Straw-15, Purple apex-I, White-I, Purple-I, Red apex-I, Red-1
18.	Stigma colour	White-20
19.	Lemma and Palea colour	Straw-12 Brown spots on straw-I, Brown furrow on straw - 3, Purple-I, Gold and gold furrows on straw background - 3
20.	Lemma and Palea Pubescence	Absent-17, Weak -2, Medium-1

Table 3: Morphological Characteristics of local land races (Short Grain Aromatic Rice Germplasm)

Entries	LBP	LBC	BLSC	FLA	LC	LS	CC	AC	CA	PT	PB	PA	PE	THr	AN	AnC	ApC	SC	LPC	LmPb
Gopalbhog	1	2	1	1	1	2	1	1	1	1	1	2	1	3	9	1	2	1	1	1
Badshahbhog	1	2	1	1	1	2	1	1	1	1	1	2	1	3	0	0	4	1	1	1
Chini Kapoor	1	1	1	3	1	2	1	1	1	5	1	2	1	3	0	0	2	1	1	1
Tulsi Amrit	1	1	1	1	1	2	1	1	5	5	1	2	1	3	0	0	7	1	3	1
Jheena Sambha	1	1	1	1	1	2	1	1	5	5	1	2	1	3	0	0	2	1	3	1
Pampudi Basmati	2	1	1	1	1	2	1	1	1	5	1	2	1	3	0	0	2	1	0	3
Kala jeera	1	2	1	1	1	2	1	1	5	1	1	2	1	3	0	0	6	1	8	1
Chini kamani	2	1	1	1	1	2	1	1	1	5	1	2	1	3	0	0	2	1	0	1
Dhuriawa,	1	1	1	1	1	2	1	1	1	5	1	2	1	3	0	0	2	1	0	1
Jeera Sanna'	2	1	1	1	1	2	1	1	1	5	1	2	1	3	0	0	2	1	0	1
MahiSugandha	2	2	1	3	1	2	1	1	1	5	1	2	1	3	0	0	2	1	0	4
Dubraj	2	2	1	1	1	2	1	1	1	5	1	2	1	3	9	1	1	1	0	3
Lalmati	2	2	1	1	1	2	1	1	1	1	1	2	1	3	0	0	2	1	0	1
Sakkar chini	1	1	1	1	1	2	1	1	1	5	1	2	1	3	0	0	2	1	3	1
Nanchuniya	1	2	1	1	1	2	1	1	1	5	1	2	1	3	0	0	2	1	0	1
Badshah Pasand	1	2	1	1	1	2	1	1	1	5	1	2	1	3	0	0	5	1	0	1
Jeera batti	1	1	1	1	1	2	1	1	1	5	1	2	1	3	0	0	2	1	0	1
Juhi Bengal (Azm.)	1	1	1	1	1	2	1	1	1	5	1	2	1	3	0	0	2	1	2	1
Kanakjeer	1	1	1	1	1	2	1	1	1	5	1	2	1	3	0	0	2	1	0	1
Juhi Bengal(Mau)	1	2	1	1	1	2	1	1	1	5	1	1	1	3	0	0	2	1	0	1

4. Conclusion

Twenty aromatic short grain rices of diverse origins collected from different districts of eastern Uttar Pradesh were agromorphological characterized using IRRI descriptors. Frequency distribution of morphological traits shows that no variation was observed for basal leaf sheath color, ligule color, ligule shape, collar color, auricle color, Secondary branching of panicle, Panicle Exertion, Panicle threshability and stigma color among short grain aromatic rices while wide range of variation was recorded for Leaf blade Pubescence, Flag leaf angle, Ligule colour, Panicle type, Lemma and Palea Colour & Lemma and Palea Pubescence. Leaf blade Pubescence was varied from glabrous to intermediate among the tested genotypes.

5. References

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