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CATALOGUING OF GORA RICES GERMPLASM WITH RESPECT TO QUANTITATIVE TRAITS

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ABSTRACT

Fifty gora rice germplasm accessions were evaluated for 25 quantitative traits during Kharif 1991 and 1992. On the basis of quantitative traits studied, eight gora rice strains viz. Gora Dhan 1, Gora Dhan 8, Jarang Gora-1, Karanga Gora 2, Lalmati Gora 1, Karanga Gora 1, Naud Gora 1, and Nanhi Gora 1 were found promising. These can be used in hybridization programme or even directly as varieties in specific area.

Key words: Gora rice, catalogue, promising selections.

Gora rices are grown under rainfed and undulating unbunded lands of Chotanagpur and Santhal Pargana regions of South Bihar. Gora rices possess early maturity and ability to tolerate moisture stress. Fortunately, the magnitude of genetic erosion in paddy is low in the plateau region of Bihar as compared to other parts of the country because the latest improved varieties are confined only to irrigated areas and did not spread much in this tribal belt. Rice being cultivated in the monsoon season faces problem of adaptation to specific ecosystems. As such to combat these problems breeders are searching for new genes for multiple resistance. The traditional Indica rice collections have been found to be major donors of such traits [1]. A collection of fifty gora rice germplasms was characterized and evaluated so as to prepare a catalogue for ready reference in upland rice improvement programme.

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MATERIALS AND METHODS

The experimental materials consisted fifty collections of germplasm (Table 1), were sown with Brown Gora 23-19 (BR-16) used as control under direct seeding in rainfed upland situation during two kharif seasons viz., 1991 and 1992 in 2-row plot of 3 m length. The row spacing of 30 cm within each accession and so in between accessions and plant to plant distance was maintained as 20 cm. Brown Gora 23-19 was also sown the same way after every 10 accessions for evaluation and characterization of gora against a reference genotype. The observations were recorded on five random plants for 25 quantitative characters. The Standard Evaluation System developed by the IRRI [2] was followed for recording data for most of the traits.

RESULTS AND DISCUSSION

Considerable variation was recorded for tiller number/plant which ranged from 4 in Black Gora 2, Black Gora 3, Gora Dhan 4, Gora Dhan 10, Gora 3 to 7 in Barka Gora 3. The well adapted upland variety Brown Gorá 23-19 had only 6 tillers per plant. Plant height also showed considerable variation. Panicle length ranged from 13.8 cm in Black Gora 4 to 23.1 cm in Karanga Gora 1. The cultivated variety Brown Gora 23-19 had only 19.8 panicle length. Kernel length and breadth as well as L/B ratio showed large variation from 2.03 in Nawakhani Gora 1 to 3.40 in White Gora 1. Most of the accessions had high fertility (fertility grade high 1 tiller/plant), few had medium fertility, but none was semisterile (grades 5, 6) highly sterile (grade 7), or totally sterile (grade 9). The lowest grain yield/plant was 2.0 gm in Lalmati Gora 1 and maximum (12.35 g) in Crossa Gora 1. Medium grain yield was recorded in Karanga Gora 1 (8.20 g) and Brown Gora 23-19 (7.08 g). The 100-grain weight of the well adapted variety Brown Gora 23-19 was 2.90 g. The accessions with 100-grain weight higher than the check variety Brown Gora 23-19 were Chhoteka Gora 1 (3.0 g), Chain Gora 1 (3.04 g), Gora Dhan 2 (3.0 g), Gora Dhan 5 (3.0 g), Gora Dhan 12 (3.05 g), and Karanga Gora 1 (3.07 g). The accessions latest to flower were Black Gora 4 and Black Gora 5 (73 days), and among the earliest were Gora Dhan 1 and Karanga Gora 2 (52 days), Gora Dhan 11, Gora 2 and Naud Gora (54 days). A few other medium early accessions which followed earlier than Brown Gora 23-19 (flowering in 65 days) were Gora Dhan 9 and Chowri Gora 1 (56 days), Chain Gora 1, Dudhi Gora 1 and Gora Dhan 2 (57 days) and Gora 1, Gora Dhan 10 and Nawakhani Gora 1 (55 days).

On the basis of characterization, evaluation and phenotypic acceptability eight germplasm accession of Gora rices were identified as most promising for utilization in the hybridization programme or even for direct use as cultivars. These strains are briefly described below (Table 2).

Table 1. Germplasm of upland gora rice under investigation

Access-ion No.	Germplasm line	Access-ion No.	Germplasm line	Access-ion No.	Germplas line	Access-ion No.	Germplas line
1	Barka Gora 1	14	Chirikata Gora 2	27	Gora Dhan 10	40	Naud Gora 1
2	Barka Gora 2	15	Chowri Gora 1	28	Gora Dhan 11	41	Nanhi Gora 1
3	Barka Gora 3	16	Chain Gora 1	29	Gora Dhan 12	42	Pidi Gora 1
4	Black Gora 1	17	Dudhi Gora 1	30	Gora 1	43	Pawas Gora 1
5	Black Gora 2	18	Gora Dhan 1	31	Gora 2	44	Rasgadali Gora 1
6	Black Gora 3	19	Gora Dhan 2	32	Gora 3	45	Raskadam Gora 1
7	Black Gora 4	20	Gora Dhan 3	33	Jarang Gora 1	46	Shahar Gora 1
8	Black Gora 5	21	Gora Dhan 4	34	Karanga Gora 1	47	Saraiya Gora 1
9	Black Gora 6	22	Gora Dhan 5	35	Karanga Gora 2	48	Satha Gora 1
10	Black Gora 7	23	Gora Dhan 6	36	Lahar Gora 1	49	White Dudhi 1
11	Chhotaka Gora 1	24	Gora Dhan 7	37	Lalmati Gora 1	50	White Gora 1
12	Crossa Gora 1	25	Gora Dhan 8	38	Manjhela Gora 1	51	Brown Gora 23-19
13	Chirikata Gora 1	26	Gora Dhan 9	39	Nawakhani Gora 1		(commercial cultivar)

Gora Dhan 1. Gora Dhan 1 is the earliest flowering accession (52 days), i.e. 13 days ahead of Brown Gora 23-19. It is taller (117 cm) than brown Gora 23-19 (108.0 cm), and possesses loose threshing ability.

Gora Dhan 8. Gora Dhan 8 is short statured (87.0 cm) in comparison to Brown Gora 23-19 (108 cm) and late by 3 days in 50% flowering (60 days) whereas Brown Gora 23-19 flowered in 65 days. The L/B ratio of grain is 3.09 in Gora Dhan 8 while it is 2.74 in Brown Gora 23-19. Other characters are same as that of Brown Gora 23-19.

Jarang Gora 1. The Jarang Gora 1 is found to be promising on the basis of phenotypic acceptability. The plant height was 92.0 cm as compared to 108.0 cm of Brown Gora 23-19. This is earlier by six days in flowering than Brown Gora 23-19. Other characters are same as Brown Gora 23-19.

Karanga Gora 1. Plant height of this accession is 103.66 cm with flowering duration of 59 days as compared to well adapted variety Brown Gora 23-19 which is 108.0 cm tall and flowered in 55 days. The panicle is longer (23.13 cm) than Brown Gora 23-19 (19.75 cm). The grain weight/panicle is 1.64 g as compared to 1.18 g in case of Brown Gora 23-19. The grain weight/plant is also 8.20 g as compared to 7.08 g of Brown Gora 23-19, while 100 grain weight is higher (3.07 g) than the variety Brown Gora 23-19 has 2.90 g only. Only characters are same as Brown Gora 23-19.

Table 2. Cataloguing of 8 Gora rice germplasms

Germplasm line	Tillering ability	Tillers per plant	Ligule length (cm)	Culm		Outer diameter (cm)	Plant height (cm)	Steile lemma length (cm)	Panicle	
				length (cm)	number (EBT)				length (cm)	threshability
Gora Dhan 1	5	5	1.40	98.33	5	0.43	117.00	2.21	18.50	7
Gora Dhan 8	3	5	1.60	73.33	5	0.32	87.00	2.48	13.66	9
Jarang Gora 1	3	6	1.76	75.14	5	0.40	92.00	2.66	17.66	9
Karanga Gora 1	3	6	1.76	85.33	5	0.38	103.66	2.83	23.13	5
Karanga Gora 2	5	5	2.10	89.33	5	0.30	99.33	1.91	20.00	5
Lalmati Gora 1	3	5	1.00	90.06	4	0.45	108.66	2.60	18.60	9
Naud Gora 1	5	6	1.86	48.00	6	0.30	64.33	2.23	16.00	9
Nanhi Gora 1	5	5	1.10	108.43	4	0.41	128.66	2.58	20.23	5
Brown Gora 23-19 (control)	3	6	1.68	94.27	6	0.40	108.00	2.75	19.75	1

Tillering ability: 3—good (5–7 tillers/plant); 5—medium (3–5 tillers/plant); 7—poor (2–3 tillers/plant). Panicle threshability: 1—difficult (less than 1%); 3—moderately difficult (1–5%), 5—intermediate (6–25%); 7—loose (26–50%); 9—easy (51–100%). Spikelet sterility: 1—Highly fertile (more than 90%); 3—sterile (75–89%).

Karanga Gora 2. This is another early maturing accession which flowered in 52 days i.e. 13 days earlier to Brown Gora 23- 19. The plant height is recorded 99.33 cm as compared to the Brown Gora 23-19 (108.0 cm). Other characters are same as Brown Gora 23-19.

Lalmati Gora 1. The plant height (108.66 cm) is almost the same as that of Brown Gora 23-19. This accession flowered 3 days earlier than Brown Gora 23-19 (flowering duration of Lalmati Gora-1 is 62 days whereas Brown Gora 23-19 flowered in 65 days). The panicle length is 18.60 cm and the L/B ratios is 2.27. Rest of the characters are observed to the same as that of Brown Gora 23-19.

Naud Gora 1. Naud Gora 1 is a dwarfest one (64.33 cm) as compared to Brown Gora 23-19 (108 cm). This accession is 11 days earlier (flowered in 54 days) than Brown Gora 23-19. The tillering ability is comparable to Brown Gora 23.19. The rest characters are same as that of Brown Gora 23.19.

Nanhi Gora 1. Nanhi Gora 1 is one of the tallest genotype (128.66 cm) among all the 50 accessions. This accession is earlier in flowering by 8 days (flowered in 57 days) than Brown Gora 23-19. The L/B ratio is recorded as 2.67 as compared to 2.74 of Brown Gora 23-19. The other characters are same as that of Brown Gora 23-19.

with respect to quantitative traits

Grain			Straw	Brown rice			Spikelet	Grain	Grain	100-	50%	Maturity
length (mm)	breadth (mm)	L/B ratio	weight per plant (g)	length (mm)	breadth (mm)	L/B ratio	steri-lity	wt. per panicle (g)	weight per plant (g)	grain weight (g)	flower-ing (days)	(days)
9.53	3.50	2.72	8.25	6.60	2.9	2.27	1	0.99	4.95	2.95	52	82
8.66	2.80	3.09	7.90	6.20	2.6	2.38	3	0.46	2.40	2.16	68	98
9.16	3.73	2.45	9.36	6.66	3.03	2.19	1	1.15	5.75	2.91	59	89
9.83	3.73	2.63	12.30	6.86	2.96	2.31	1	1.64	8.20	3.07	59	89
9.10	3.4	2.67	6.00	6.06	2.76	2.19	1	0.98	4.90	2.64	52	82
8.03	3.53	2.27	9.95	5.96	2.96	2.01	3	0.48	2.00	2.92	62	92
8.63	3.20	2.69	5.94	5.93	2.93	2.02	1	0.73	4.38	2.22	54	84
9.43	3.53	2.67	12.00	6.43	3.00	2.14	1	1.29	5.16	2.71	57	87
9.18	3.25	2.74	11.40	6.30	2.93	2.13	1	1.18	7.08	2.90	65	95

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