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Morphological and Agronomic Attributes of Some Local and Modern Aromatic Rice Varieties of Bangladesh

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Abstract: The study was conducted in order to investigation the relationship between grain yield with the morphological parameters of five local and three modern aromatic rice varieties. The varieties Kataribhog, Radhunipagal, Chinigura, Badshabhog, Kalizera, BRRI dhan34, BRRI dhan dhan37 and BRRI dhan38 were transplanted. All the parameters varied significantly in different aromatic rice varieties. Among the aromatic rice varieties the highest grain yield was obtained from BRRI dhan34 which identically followed by Kataribhog. The highest plant height was observed in Chinigura which statistically similar to Kataribhog The highest number of fertile tillers hill^{-1} was observed in BRRI dhan37 and it was identically followed by Radhunipagal, Badshabhog, Chinigura, BRRI dhan38 and the lowest fertile tillers hill^{-1} was obtained from Kalizera which was statistically similar to Kataribhog. The highest number of grains panicle^{-1} was found in BRRI dhan34 and that was the lowest in BRRI dhan38. Maximum 1000 grain weight was observed in BRRI dhan38. In respect of yield BRRI dhan34 and Kataribhog are suitable for Dinajpur region in Bangladesh during T. aman season.

Key words: Morphological attributes, agronomical attributes, aromatic rice variety

INTRODUCTION

Several morphological characters are the major determining factor of rice grain yield. The recognition of genetic variability in any character involved in yield synthesis provides scope to the possibility of crop improvement[1]. Aromatic rice varieties are rated best in quality and fetch much higher price than non-aromatic rice. The demand of aromatic rice for internal consumption and also for export are increasing day by day[2].

Most of the aromatic rice varieties in Bangladesh are traditional type photo-period sensitive and grown during aman season[3]. Selection of right type of variety is most important factors for maximizing rice production. Yield of rice changes of growing environment, such as different locations, seasonal fluctuations, different dates of planting etc.[4]. The information is limited on varietals response more particularly in respect of aromatic rice. Therefore, the present investigation was under taken to study the effect of local and modern variety on yield performance of aromatic rice.

MATERIALS AND METHODS

The experiment was conducted at Hajee Mohammad Danesh Science and Technology University farm, Dinajpur, Bangladesh during aman season of 2004. The experimental site was a medium high land with sandy loam soil having a pH value 6.0. The experiment was laid out in a Randomized Complete Block Design with three replications. Five local and three modern aromatic rice varieties namely, Kataribhog (V_1), Radhunipagal (V_2), Chinigura (V_3), Badshabhog (V_4), Kalizera (V_5), BRRI dhan34 (V_6), BRRI dhan37 (V_7) and BRRI dhan38 (V_8) were used in this study. The unit plot size was 4.0x2.5 m. The unit plots were uniformly fertilized as per recommendation with urea, TSP and MP at the rate of 120, 50, 60 kg ha^{-1} as source of N, P and K, respectively. All P and K fertilizer were applied as basal dose during final land preparation. Urea was top dressed in 2 equal splits at 20 and 45 days after transplanting. All other cultural practices were done uniformly as and when required. The 30 days old seedlings were transplanted at a spacing of 20x15 cm using 3 seedlings hill^{-1}. At harvest, 10 hills from each plot were taken out randomly to record yield parameters and the whole plots harvested to obtain grain and straw yields. Data were analyzed followed the ANOVA technique and mean differences adjudged with Duncan's Multiple Range Test.

RESULTS AND DISCUSSION

The occurrence of different morphological features like foliage, leaf orientation, leaf breadth, apiculli, awn, panicle, glume color and grain shape

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Table 1: Morphological features of 5 local and 3 modern aromatic rice varieties of Bangladesh

Varieties	Foliage	Leaf orientation	Leaf breadth	Apiculli	Awn	Panicle	Glume color	Grain shape
V_1	Light green	Droopy	Medium	Pointed	Absent	Medium and lax	Straw	Medium bold
V_2	Dark green	Droopy	Medium	Pointed	Absent	Medium and lax	Black and straw	Short bold
V_3	Light green	Droopy	Medium	Pointed	Absent	Medium and lax	Straw	Short bold
V_4	Light green	Relatively erect	Medium	Pointed	Absent	Medium and lax	Straw	Short bold
V_5	Light green	Droopy	Medium	Pointed	Absent	Long and lax	Black	Short bold
V_6	Light green	Droopy	Medium	Pointed	Absent	Long and lax	Straw	Short bold
V_7	Light green, stem light yellowish green	Erect	Wie	Pointed	Complete tip awning, with straw color	Long and compact	Straw	Medium slender
V_8	Light green	Erect	Wide	Pointed	Complete tip awning, with straw color	Long and compact	Straw	Medium slender

Table 2: Agronomic characters of 5 local and 3 modern aromatic rice varieties of Bangladesh

Varieties	Plant height (cm)	Total tillers hill^{-1} (No.)	Fertile tillers hill^{-1} (No.)	Panicle length (cm)	Spikelets panicle^{-1} (No.)	Grains panicle^{-1}(no.)	1000 grain wt. (g)	Grain yield (t ha^{-1})	Straw yield (t ha^{-1})
V_1	158.8ab	9.5c	8.6c	20.77c	106.2c	95.5cd	14.83c	3.3ab	8.9a
V_2	148.0bc	11.9ab	10.5ab	20.65c	108.3c	7.3c	11.61d	2.9c	7.4cd
V_3	162.8a	12.5a	11.1a	22.76ab	136.1a	118.6ab	10.67e	2.7cd	8.6b
V_4	143.9c	11.3abc	10.6ab	21.74bc	121.2b	110.3bc	10.68e	3.2b	7.8bc
V_5	150.9bc	9.8c	8.7c	23.04ab	123.0b	106.3bc	12.11d	2.5d	5.8e
V_6	146.9c	10.2bc	9.3bc	23.04ab	142.6a	125.8a	10.51e	3.5a	8.7b
V_7	121.6d	12.2ab	11.4a	22.94ab	108.5c	81.21de	17.38b	2.6cd	6.5de
V_8	123.7d	11.4abc	9.7abc	24.14a	87.79d	73.8e	19.23a	2.7cd	6.6de
level of sig.	0.01	0.05	0.01	0.05	0.01	0.01	0.01	0.01	0.01
CV(%)	4.11	9.88	9.29	4.81	5.71	8.18	3.23	5.15	6.71

*In a column, means having common letter (s) do not differ significantly at 5% level of probability

V_1-Kataribhog, V_2-Radhunipagal, V_3-Chinigura, V_4-Badshabhog, V_5-Kalizera, V_6-BRRI dhan34, V_7-BRRI dhan37, V_8-BRRI dhan38

shows variations (Table 1). The foliage of Radhunipagal was darkgreen in color but others were light green. Erect leaf orientation was found in BRRI dhan37, BRRI dhan38 and Badshabhog was relatively erect but others were droopy. Pointed apiculli were observed in all varieties The glume of maximum varieties were straw color except Kalizera and Radhunipagal. The glume of Kalizera was completely black in color and Radhunipagal was mixture of black and straw color. Long and compact panicle with awn were found in BRRI dhan37 and BRRI dhan38. Kataribhog grain was medium bold and Radhunipagal, Chinigura, Badshabhog, Kalizera, BRRI dhan34 were short bold but BRRI dhan37 and BRRI dhan38 were medium slender type in shape (Table 1).

The highest plant height was observed in Chinigura (162.8 cm) which statistically similar to Kataribhog (Table 2). The highest number of total tillers hill^{-1} was observed in Chinigura (12.5) which was identically followed by Radhunipagal, Badshabhog, BRRI dhan37 and BRRI dhan38. The lowest total tillers hill^{-1} was obtained from Kalizera (9.8) which was statistically similar to Kataribhog. Badshabhog, BRRI dhan34 and BRRI dhan38. The highest number of fertile tillers hill^{-1} was observed in BRRI dhan37 (11.4) which identically followed by Radhuni pagal, Badshabhog, Chinigura, BRRI dhan38 and the lowest fertile tillers hill^{-1} was obtained from Kalizera (8.7) statistically similar to Kataribhog. The highest number of spikelets panicle^{-1} was found in BRRI dhan34 (142.6) and that was the lowest in BRRI dhan38 (87.79). The highest number of grains panicle^{-1} was found in BRRI dhan34 (125.8) and that was the lowest in BRRI dhan38 (73.8). Maximum 1000 grain weight was observed in BRRI dhan38 (19.23g) and the lowest 1000 grain weight was found by BRRI dhan34 which identical to Badshabhog and Chinigura. Grain yield differ significantly with different varieties (Table 2). Among the five local and three modern aromatic varieties the highest grain yield (3.5 t ha^{-1}) was obtained from BRRI dhan34 which was identically followed by Kataribhog. The lowest grain yield (2.5 t ha^{-1}) was obtained from Kalizera which was statistically similar to Chinigura, BRRI dhan37 and BRRI dhan38. These could happen due to fertile tiller number hill^{-1} and grains panicle^{-1}. Reduction in grain yields may be attributed to significant reduction in fertile tiller hill^{-1}, grains panicle^{-1}, panicle length and 1000 grain weight. Sikder *et al.*[5] reported that Badshabhog performed better than Kalizera in respect of grain yield.

Kataribhog gave the highest straw yield (8.9 t ha^{-1}) and the lowest straw yield (5.8 t ha^{-1}) was obtained from Kalizera identically followed by BRRI dhan37 and BRRI dhan38. Panicle length differed significantly in aromatic rice varieties. Maximum panicle length was found by BRRI dhan38 (24.14 cm) and minimum panicle length by Radhunipagal (20.65 cm). Junco *et al.*[6] reported positive linear relationship of panicle length with the number of spikelets panicle^{-1}. It was concluded that BRRI dhan34 and Kataribhog are suitable in Dinajpur region in respect of yield.

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REFERENCES

1. IRRI, 1989. Physiological aspects for increasing production. In: Progress in Irrigated Rice Research. IRRI. Los Banos. Philippines, pp: 362-363.
2. Das, T. and M.A. Baqui, 2000. Aromatic Rices of Bangladesh. Aromatic Rices. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi. India, pp: 184-187.
3. Baqui, M.A., M.E. Harun, D. Jones and R. Straingfellow, 1997. The export potential of traditional varieties of rice from Bangladesh. Bangladesh Rice Research Institute, Gazipur. Bangladesh.
4. Sarker, U., 2002. Stability for grain yield under difference planting times in rice. Bangladesh J. Agric. Res., 27: 425-430.
5. Sikder, M.S.I., M. Ahmed and S.M.A. Hossain, 2001. Effect of spacing and nitrogen fertilizer level on the yield and quality of some varieties of aromatic rice. M.S.Thesis, BAU, Mymensingh, Bangladesh
6. Junco, Y., Y. Tsuno, E. Hareo and I. Shinobu, 1992. Relation ship of number of spikelets per panicle to the characteristics of shoot and the size around growing point at panicle initiation stage in the rice varieties. Japanese J. Crop. Sci., 61: 568-575.