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## **AGRO-MORPHOLOGICAL AND QUALITY CHARACTERIZATION OF BADSHAH BHOG GROUP FROM AROMATIC RICE GERMPLASM OF CHHATTISGARH**

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India sub continent is a home for aromatic rice diversity. Land races and wild species possess immense potential of most valuable genes which can be effectively utilized in the present day breeding programmes to evolve miracle varieties in rice that possess not high yield potential and quality but also resistant to biotic and abiotic stresses. The present studies were carried out to characterize thirty two aromatic rice accessions of Badshah bhog group from IGKV, Raipur, Chhattisgarh germplasm. These germplasm accessions were evaluated for twenty-two morphological, six agronomical and eight quality characters. The specific genotypes B: 1340, B: 2039, B: 2495, B: 2816, B: 16930 B: 2354, B:1639, B:2094 were identified for quality and agronomical characteristics. These may be used in hybridization programme to achieve desired segregants for good grain quality with higher yield.

**Key Words:** Morphological characters. quality characters, characterization in aromatic rice.

### **Introduction**

The cultivated rice of Asia (*Oryza sativa* L.) is supposed to have originated in the South and/ or South East Asia. India forms a major part of this region. Thus, it is traditionally rich in the diversity of rice including the wild progenitors of cultivated rice (Singh *et al.*, 2001). Genetic diversity probably serves as an insurance against crop failure (Subba Rao *et al.*, 2001). Landraces and wild species possess immense potential of most valuable genes which can be effectively utilized in the present day breeding programmes to evolve miracle varieties in rice that possess not high yield potential and quality, but also resistant to biotic and abiotic stresses (Saxena *et al.*, 1988). Collection and characterization of this germplasm is not only important for utilizing the appropriate attribute based donors in breeding programmes, but is also essential in the present era for protecting the unique rice.

Indian sub continent is a home for aromatic rice diversity. Aroma quality of scented rice is a major character which increases the value of rice in international market (Nayak *et al.*, 2002). The demand for special purpose aromatic rice has dramatically increased over the past two decades. India emerges as one of the

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major exporter of rice in international markets. The success of any breeding programme depends upon the selection of the parents for hybridization.

### **Materials and Method**

Collection and characterization of existing germplasm is not only important for utilizing the appropriate attribute based donors in breeding programmes, but is also essential in the present era for protecting the unique rice. A total of 32 aromatic rice accessions were selected from a collection of aromatic rice germplasm in IGKV, Raipur on the basis of their nomenclature. Morphological descriptors are presented in Table 1. Twenty five days old seedlings were transplanted with a spacing of 20cm and 15cm between rows and between plants, respectively. Observations were recorded on five randomly selected plants for 22 morphological descriptors viz., 1. Leaf Length (LL) in cm at heading stage 2. Leaf Width (LW) in cm at heading stage, 3. Leaf Blade Pubescence (LBP) at booting and heading stage with classes 1. Glabrous, 2. Intermediate, 3. Pubescent 4. Leaf Blade Colour (LBC) at stem elongation to heading stage with classes 1. Light green, 2. Green, 3. Dark green, 4. Purple tips, 5. Purple margin. 6. Purple blotch, 7. Purple; 5. Basal Leaf Sheath Colour (BLSC) at early to late vegetative stage with classes 1. Green, 2. Purple lines 3. Light purple, 4. Purple; 6. Flag Leaf Angle (FLA) at stem elongation to booting stage with classes 1. Erect, 3. Intermediate, 5. Horizontal, 6. Descending (more than 90 degree), 7. Ligule Colour (LC) at stem elongation to booting stage with classes 1. White, 2. Purple lines, 3. Purple. 8. Collor Colour (CC) at stem elongation to booting stage with classes 1. Light green, 2. Green, 3. Purple, 9. Auricle Colour (AC) classes 1. Light green, 2. Purple; 10. Culm Angle (CmA) at milk stage to maturity stage with classes 1. Erect, 3. Intermediate, 5. Open, 7. Spreading. 9. Procumbent; 11. Panicle Type (PnT) at dough stage with classes 1. Compact, 5. Intermediate, 9 Open, 12. Secondary Branching of Panicles (PnBr) at dough stage classes 0. Absent, 1. Light, 2 Heavy, 3. Clustery, 13 Panicle Axis (PnAK) at milk stage to mature stage with classes 1. Straight, 2. Droopy; 14 Panicle Exertion (ExS) at milk stage to mature stage with classes 1. Well exerted, 2. Moderately well exerted, 3 Just exerted, 7. Partly exerted, 9. Enclosed; 15. Panicle Threshability (Thr) at mature stage with classes 1. Difficult (>1%), 3. Moderately difficult (1-5%), 5. Intermediate (6-25%), 7. Loose (26-50%), 9. Easy (51-100%); 16. Awning (An) at milk stage to mature stage with classes 0. Absent, 1. Short and partly awned, 5. Short and fully awned; 7. Long and party awned, 9. Long and fully awned; 17 Awn colour (AnC) at heading stage with classes 0. Awnless, 1. Straw, 2. Gold, 3. Brown (Twany), 4. Red, 5. Purple, 6. Black; 15. Apiculus

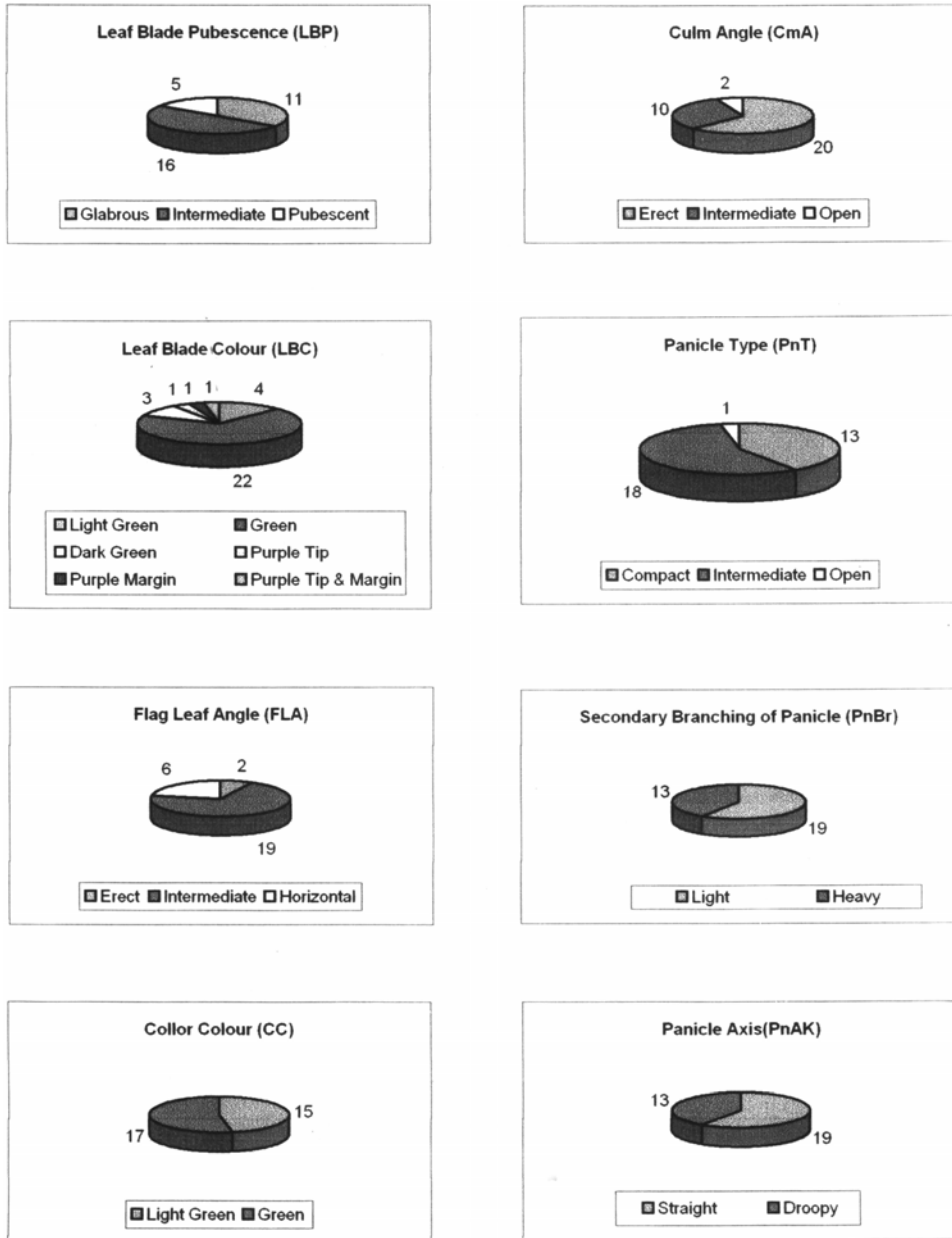
Colour (ApC) at milk stage to mature stage with classes 1. White, 2. Straw, 3. Brown, 4. Red, 5. Red Apex, 6. Purple, 7. Purple Apex; 19. Stigma Colour (SgC) at heading stage with classes 1. White, 2. Light green, 3. Yellow, 4. Light purple, 5. Purple; 20. Lemma and Palea Colour (LmPC) at mature stage with classes 0 straw, 1. Gold and gold furrow on straw background, 2. Brown furrow on straw, 4. Brown (Twany), 5. Reddish to light purple, 6. Purple spots on straw, 7. Purple furrow on straw, 8 Purple, 9. Black, 10. White; 21. Lemma and Palea Pubescence (LmPb) at mature stage with classes 1. Glabrous, 2. Hairs on lemma keel, 3. Hairs on upper portion, 4. Short hairs, 5. Long hairs (Velvety); 22. Sterile Lemma Colour (SLmc) at mature stage with classes 1. Straw (Yellow), 2. Gold, 3. Red, 4. Purple. Six agronomical and yield traits were recorded, such as 1. Days to 50% flowering (DF50%), 2. Plant Height (PH) in cm, 3. Panicle Length (PL) in cm, 4. Total tillers per hill (TT/hill), 5. Effective tillers per hill (ET/hill) and 6. Grain Yield (GY) in kg/ha. Eight quality traits were also recorded i.e., 1. Hulling percentage (Hull %), 2. Milling percentage (Mill %), 3. Head Rice Recovery (HRR%), 4. Kernel Length (L) in mm, 5. Kernel Breadth (B) in mm, 6. Length Breadth ratio (L/B ratio), 7. Alkali Spreading Value (ASV), and 8. Aroma.

## Results and Discussion

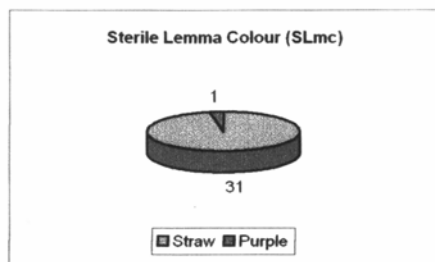
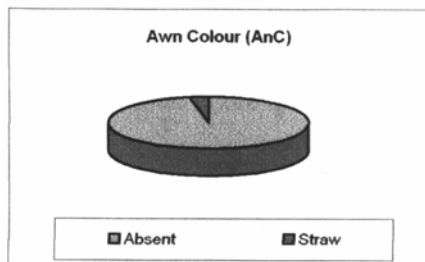
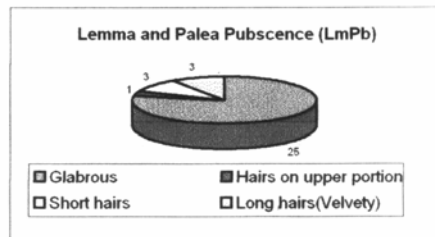
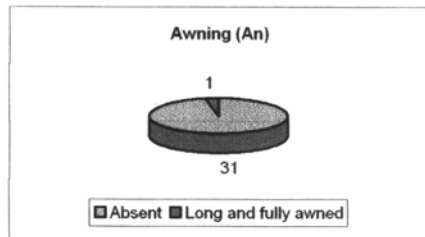
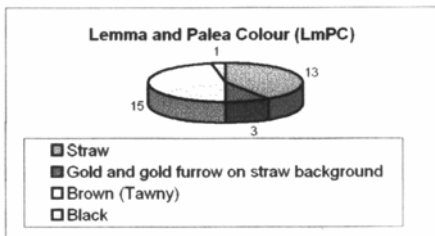
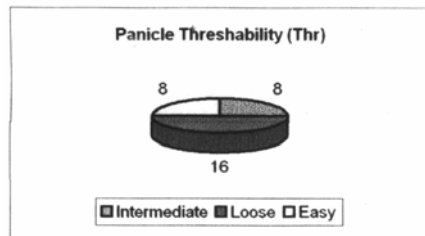
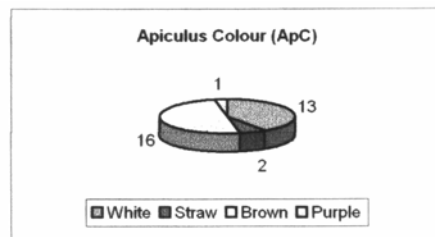
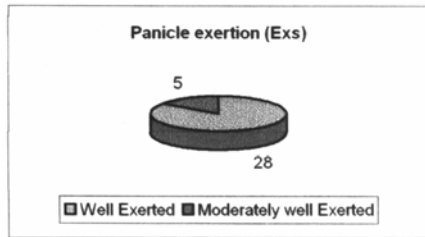
### A. Morphological characters

Twenty two morphological characters were recorded for 32 accessions. The morphological characters included leaf length (1), leaf width (2), leaf blade pubescence (3), leaf blade colour (4), basal leaf sheath colour (5), flag leaf angle (6) ligule colour (7), collar colour (8), auricle colour (9) culm angle (10), panicle type (11), secondary branching of panicles (12), panicle axis (13), panicle exertion (14), panicle threshability (15), awning (16), awn colour (17), apiculus colour (18), stigma colour (19), lemma and palea colour (20), lemma and palea pubescence (21), and sterile lemma colour (22). The results of morphological characters recorded for 32 accessions are discussed in Table 1 (Character 1 to 22) and its graphical representation of frequency distribution showed in Fig 1. Out of 22 morphological characters, leaf blade colour (4) and lemma and palea colour (20), apiculus colour (18) and Lemma and Palea Pubescence (21) found highest variation in different accessions. After that, leaf Blade Pubescence (1), flag Leaf Angle (6) culm angle (10), panicle type (11), panicle threshability (15) showed variation in different accessions and rest 7 found each of two classes among different accessions (Fig. 1 and Table 1). The remaining 6 morphological characters showed no difference among accessions.

**Fig 1. Frequency Distribution of morphological characters of Badshah Bhog Group.**



Cont'd. Fig 1.



**Table 1. Morphological traits of Badshah Bhog Group from aromatic rice germplasm.**

ACC No.	Designation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
B: 1209	Basabhog	61.2	1.1	2	2	1	3	1	2	1	1	5	1	1	1	5	0	0	1	1	0	1	1
B: 421	Badshah Bhog	54.5	1.1	2	5	1	6	1	1	1	3	5	1	2	1	5	0	0	6	1	9	1	4
B: 54 II	Badshah Bhog	58.8	0.9	1	3	1	3	1	1	1	3	5	1	1	1	5	0	0	3	1	4	1	1
B: 232 I	Badshah Bhog	43.5	1.4	2	2	1	3	1	2	1		5	1	1	1	5	0	0	3	1	4	1	1
B: 323 II	Badshah Bhog	68.4	1.3	3	2	1	5	1	2	1	1	5	1	1	1	5	0	0	1	1	0	4	1
B: 528	Badshah Bhog	57.2	1.1	1	2	1	3	1	2	1	1	5	1	1	1	5	0	0	3	1	4	1	1
B:799 II	Badshah Bhog	60.2	1.1	1	1	1	5	1	2	1	3	5	1	1	1	5	0	0	3	1	4	1	1
B: 1005	Badshah Bhog	46.6	0.9	2	2	1	3	1	1	1	1	5	1	2	1	5	0	0	3	1	4	1	1
B: 1029	Badshah Bhog	66.3	1.2	2	4,5	1	6	1	2	1	3	1	2	1	2	5	0	0	1	1	0	1	1
B: 1307	Badshah Bhog	32.8	1.2	1	2	1	1	1	1	1	5	5	1	2	1	5	0	0	1	1	0	5	1
B: 1322	Badshah Bhog	54.2	1.1	1	1	1	6	1	1	1	3	1	2	1	1	5	0	0	3	1	4	1	1
B:1340	Badshah Bhog	43.5	0.9	2	2	1	3	1	1	1	1	1	1	2	1	5	0	0	1	1	4	1	1
B: 1389	Badshah Bhog	48.9	0.9	1	2	1	3	1	1	1	1	5	1	1	2	5	0	0	1	1	0	1	1
B: 1693	Badshah Bhog	43.5	0.8	1	2	1	3	1	2	1	3	1	2	2	1	5	0	0	3	1	4	1	1
B.1727	Badshah Bhog	38.9	0.9	1	2	1	3	1	2	1	1	1	2	1	1	5	0	0	3	1	4	4	1
B. 2094	Badshah Bhog	40.1	1.1	3	1	1	3	1	2	1	1	5	1	1	1	5	0	0	2	1	4	1	1
B: 2354	Badshah Bhog	61.9	1.3	2	2	1	3	1	2	1	1	1	2	1	1	5	0	0	1	1	0	1	1
B: 2461	Badshah Bhog	71.5	0.9	3	2	1	3	1	2	1	1	1	1	2	1	3	0	0	1	1	0	1	1
B: 2495	Badshah Bhog	56.3	1.2	1	2	1	3	1	1	1	3	1	2	1	1	3	0	0	3	1	4	1	1
B: 2504	Badshah Bhog	59.8	1.1	2	2	1	1	1	1	1	1	1	1	1	2	3	0	0	1	1	1	1	1
B: 2812	Badshah Bhog	50.5	1.2	2	2	1	3	1	2	1	1	5	1	1	1	7	0	0	3	1	4	1	1

**Table 1. Cont'd**

B. 2814	Badshah Bhog	54.9	0.8	1	2	1	1	1	1	1	1	1	1	2	1	2	7	0	0	1	1	0	1	1
B: 1717	Badshah Bhog	59.3	0.9	2	1	1	3	1	1	1	1	1	2	1	1	7	0	0	1	1	0	5	1	1
B: 2604	Badshah Bhog	63.8	1.1	2	2	1	6	1	2	1	1	1	2	1	1	7	0	0	3	1	0	1	1	1
B: 2302	Badshah Bhog	53.4	1.3	3	2	1	3	1	1	1	1	5	1	2	1	3	0	0	3	1	4	4	1	1
B: 2464	Badshah Bhog	57.2	0.9	2	3	1	5	1	1	1	3	9	1	2	1	3	0	0	3	1	4	1	1	1
B: 6701	Badshah Bhog	57.5	1.2	2	2	1	5	1	1	1	1	5	2	2	1	3	0	0	3	1	1	1	1	1
B: 1639	Badshah Bhog	63.3	0.9	1	2	1	6	1	2	1	1	5	1	2	1	3	0	0	3	1	1	1	1	1
B: 1713	Badshah Bhog	44.5	1.3	3	2	1	3	1	1	1	5	5	1	2	1	3	0	0	3	1	4	3	1	1
B: 2039	Badshah Bhog	52.6	1.3	2	3	1	5	1	2	1	3	5	2	2	1	7	0	0	2	1	0	5	1	1
B: 2816	Badshah Bhog	70.6	1.1	2	2	1	3	1	2	1	1	1	2	1	2	7	9	1	1	1	0	1	1	1
Bd: 105	Badshah Bhog	52.1	1.1	2	4	1	5	1	1	1	3	5	2	2	1	7	0	0	1	1	0	1	1	1

ORPHOLOGICAL AND QUALITY CHARACTERIZATION

### B. Agronomical characters

Thirty two accessions of Badshahbhog group were evaluated for agronomical traits like plant height, panicle length, total tillers per hill and effective tillers per hill were recorded from five competitive plants of middle row of each entry, while days to 50% flowering and grain yield were on the plot basis.

**Table 2. Mean performance of agronomical characteristics of Badshah Bhog group.**

Designation		DF (50%)	PH(cm)	PL(cm)	TT/hill	ET/hill	GY (kg/ha)	Rank
Badshah Bhog	B: 1209	107	155	27	7.2	5.8	2889	18
Badshah Bhog	B: 42	94	160.2	24.4	5.8	4.4	1833	29
Badshah Bhog	B:54 II	101	146	254	70	4.0	1546	31
Badshah Bhog	B: 232 I	102	164.4	27	86	7.2	2833	22
Badshah Bhog	B: 323 II	108	146	25.8	8.4	5.4	2620	26
Badshah Bhog	B: 528	106	156	26	8.2	6.2	2667	24
Badshah Bhog	B: 799 II	104	164	264	74	64	1380	32
Badshah Bhog	B: 1005	105	1558	26	96	74	2898	17
Badshah Bhog	B:1029	104	153.4	27	7.0	5.6	2204	28
Badshah Bhog	B: 1307	78	105.6	27.4	5.8	5.0	1667	30
Badshah Bhog	B: 1322	100	154.8	27	74	52	2648	25
Badshah Bhog	B: 1340	99	135.6	26.2	7.0	6.4	3194	10
Badshah Bhog	B: 1389	108	145.6	27.4	7.2	6.4	3130	11
Badshah Bhog	B: 1693	103	156.2	27.6	8.4	7.0	3231	9
Badshah Bhog	B: 1727	104	155.6	25.4	9.4	6.2	3296	8
Badshah Bhog	B:2094	100	155.2	26.8	7.0	5.6	3685	5
Badshah Bhog	B:2354	105	157	28	8.2	5.8	4056	3
Badshah Bhog	B: 2461	103	1678	27.4	76	5.6	3361	6
Badshah Bhog	B: 2495	109	174	304	76	5.6	3361	7
Badshah Bhog	B: 2504	109	156.6	27.6	6.8	6.0	3130	12
Badshah Bhog	B:2812	103	156.6	27.8	9.0	7.2	2843	21
Badshah Bhog	B: 2814	109	166.4	286	8.2	6.0	3102	14
Badshah Bhog	B: 1717	109	145	27	7.8	7.8	2852	20
Badshah Bhog	B: 2604	107	1548	26.6	90	5.4	3111	13
Badshah Bhog	B: 2302	99	154.4	25.6	7.2	6.4	2991	15
Badshah Bhog	B:2464	102	1662	28.2	8.8	6.4	2963	16
Badshah Bhog	B: 670 I	91	162.8	28	7.8	7.0	2583	27
Badshah Bhog	B: 1639	99	180	29.2	10.6	6.2	3722	4
Badshah Bhog	B: 1713	102	179.4	24.8	8.2	6.2	2741	23
Badshah Bhog	B: 2039	104	170.2	30.6	78	6.6	4389	2
Badshah Bhog	B: 2816	103	146.6	23.4	7.8	7.4	4630	1
Badshah Bhog	Bd: 105	104	157.2	26.4	126	6.4	2870	19
Range								
Min		78	105.6	23.4	5.8	4.0	1380	
Max		109	180.0	306	12.6	7.8	4630	

DF: Days to 50% flowering, PH:Plant Height, PL: Panicle length.TT/hill: Total tillers per hill ET/hill: Effective tillers per hill, GY (kg/ha): Gram yield (kg/ha).



Of the 32 accessions, 10 top ranking accessions were identified based on the mean yield performance during 2003 and 2004. The highest grain yield (4630 kg/ha) was found in accession B: 2816 followed by B: 2039, B: 2354, B: 1639, B: 2094, B: 2461, B: 2495, B: 1727, B: 1693 and B: 1340 (Table 2). Out of 32, only 14 accessions showed more than 3000 kg/ha grain yield. Grain yield ranged between 1380 kg/ha (B: 79911) to 4630 kg/ha (B: 2816).

The character days to 50% flowering ranged from 78 days (B: 1307) to 109 Days (B: 2495, B: 2504, B: 2814 and B: 1717) and plant height ranged from 105.6 cm (B: 1307) to 180 cm (B: 1639). The accessions B: 2039, B: 2495, B: 1639, B: 2814, B: 2464, B: 2354, B: 6701 were found to have longer panicle length and it ranged between 4 cm (B: 2816) and 30.6 cm (B: 2039). For the character total tillers per hill, more number of tillers (more than or equal to 9) were found in accessions B: 105, B: 1639, B: 1005, B: 1727, B: 2812, B: 2604 and it ranged between B: 105 (12.6) to B: 42 (5.8). The character effective tillers per hill ranges between B: 105 (9.4) to B: 54 (4.0) and found higher number (more than 7) of effective tillers were found in accessions B: 1717, B: 1005, B: 2816, B: 2812, B: 2321 (Table 2).

### C. Quality characters

Quality characteristics of the rice grain are related to a complex physico-chemical property. Some have excellent kernel shape and kernel length/breadth ratio, which are the important features of quality rices (Patil *et al.*, 2003). For the character hulling percentage, all the accessions were found to have more than 80 percent hulling value except three viz., B: 421 B: 105, B: 1307. The character milling percentage more than 75 percent is desirable for suitable screening of genotypes found in 14 accessions B: 1029, B: 79911, B: 1322, B: 2354, B: 6701, B: 1717, B: 1693, B: 2461, B: 2464, B: 421, B: 528, B: 2504, B: 1639, B: 2039. For quality evaluation, head rice recovery is one of the most important characters, so more than 65 percent head rice recovery percentage is desirable, which was found in 6 accessions B: 1029, B: 79911, B: 1389, B: 528, B: 249, B: 2604 (Table 3).

For the character kernel length (mm) 2 accessions viz. B: 1307, B: 2816 were found to have more than 3 mm length of kernel and in length breadth ratio accession were found to have more than 3 of L/B ratio. According to grain dimension of milled rice, out of 32 evaluated for shape and size depending upon kernel length and length/breadth ratio, the accession B: 1389 is short-slender, B: 2816, B: 1307 long slender 26 in short medium and remaining 9 accessions were short bold type according to International rice shape and size from IRRI (Table 3 and 4).

**Table 3. Grain quality characteristics of Badshah Bhog group.**

Entry No	ACC. No.	Designation	HULL( %)	MILL (%)	HRR (%)	KL (mm)	KB (mm)	L/B	A.S.V.	AROMA
54	B: 1209	Basabhog	80.74	74.99	57.81	4.3	2.1	2.05	6.00	MS
55	B: 42 I	Badshah Shog	79.97	75.57	43.89	4.6	2.1	2.19	5.33	SS
56	B: 54 II	Badshah Shog	81.75	72.50	53.00	4.1	1.9	2.16	5.83	SS
57	B: 232	Badshah Shog	81.76	73.27	53.72	4.3	2.1	2.05	5.00	S
58	B: 323 II	Badshah Shog	82.13	72.08	64.74	4.4	2.0	2.20	5.67	SS
59	B: 528	Badshah Shog	81.72	75.56	65.53	4.0	2.0	2.00	6.00	SS
60	B:799 II	Badshah Shog	82.10	78.39	66.11	4.4	2.1	2.10	5.33	S
61	B: 1005	Badshah Shog	81.11	72.13	62.97	3.9	2.0	1.95	4.33	MS
62	B:1029	Badshah Shog	81.30	80.54	73.69	4.0	1.9	2.11	4.83	S
63	B: 130	Badshah Shog	79.33	72.69	39.02	6.8	2.1	3.24	4.33	S
64	B: 1322	Badshah Shog	81.99	78.22	60.79	4.0	2.1	1.90	6.00	MS
65	B: 1340	Badshah Shog	81.16	73.64	44.10	4.0	2.1	1.90	6.00	SS
66	B:1389	Badshah Shog	81.73	73.68	65.69	3.9	1.2	3.25	5.83	SS
67	B: 1693	Badshah Shog	81.31	75.77	63.95	3.7	2.0	1.85	6.00	SS
68	B: 1727	Badshah Shog	81.05	74.48	64.65	4.0	2.0	2.00	5.83	MS
69	B: 2094	Badshah Shog	81.75	72.93	53.34	4.4	2.1	2.10	4.00	SS
70	B: 2354	Badshah Shog	81.35	78.11	57.81	4.3	2.1	2.05	5.60	SS
71	B: 2461	Badshah Shog	81.56	75.71	57.25	4.2	2.0	2.10	5.83	SS
72	B: 2495	Badshah Shog	80.98	73.77	65.26	4.1	2.1	1.95	6.00	SS
73	B: 2504	Badshah Shog	81.Q3	75.24	60.02	4.2	2.0	2.10	6.33	MS
74	B: 2812	Badshah Shog	81.22	74.23	57.33	4.2	1.9	2.21	6.33	MS
75	B:2814	Badshah Shog	81.85	72.25	58.89	4.1	2.0	2.05	6.00	SS
76	B: 1717	Badshah Shog	82.31	76.65	62.63	4.1	2.1	1.95	5.67	SS
77	B: 2604	Badshah Shog	81.96	74.40	65.25	4.1	2.1	1.95	4.00	SS
192	B: 2302	Badshah Shog	81.26	74.27	61.65	4.0	2.0	2.00	4.83	MS
193	B: 2464	Badshah Shog	80.58	75.57	57.78	4.1	1.9	2.16	5.50	SS

**Table 3. Cont'd**

214	B: 670)	Badshah Shog	81.90	78.00	50.38	4.1	2.2	1.86	5.67	MS
215	B: 1639	Badshah Shog	80.58	75.03	56.51	4.0	2.2	1.82	6.00	SS
216	B: 1713	Badshah Shog	80.04	73.76	43.71	4.2	2.1	2.00	5.83	SS
217	B: 2039	Badshah Shog	80.87	75.00	63.23	4.6	2.3	2.00	5.17	MS
218	B: 286	Badshah Shog	80.51	71.85	49.26	5.1	2.0	2.55	5.67	SS
254	Bd: 105	Badshah Shog	79.79	70.39	63.00	4.1	2.0	2.05	5.67	SS
Range										
Min			79.33	70.39	39.02	3.7	1.2	1.82	4.00	
Max			82.31	80.54	73.69	6.8	2.3	3.25	6.33	

HULL%-Hulling percentage, MILL% -Milling percentage, HRR%-Head Rice Recovery Percentage, KL- Kernel Length, KB- Kernel Beadth, L/B- Kernel Length/Breadth ratio, ASV-Alkali Spreading Value.

For Gelatinization temperature (Alkali Spreading Value) is the measure of cooking ease and is indexed by alkali digestibility test (Little *et al.*, 1958). No entry was found low rating of alkali spreading value. Out of 32 entries 7 (B: 2094, B: 2604, B: 1307 B: 1005, B: 2302, B: 1029 and B:2321) were observed in intermediate scale value 4-5, 23 in scale value 5-6 and remaining 2 accessions (B: 2812 and B: 2504) in scale value 6-7 (Table 3 and 4). The intermediate rating (4-5) indicates medium disintegration and classified as intermediate gelatinization temperature and highly desirable for quality grain (Bansal *et al.*, 2006).

**Table 4. Top ranking accessions from predominant groups.**

Characters	No. of accessions	Best donors
Top ranking accessions for yield (kg/ha)	10	B. 2816 (4630). B: 2039 (4389) B: 2324, B: 1639 (3722), B: 2094 (3685), B: 2461 (3361), B: 249 (3361), B: 1727 (3296), B: 169 (323)) B: 1340 (3194)
High Milling percentage (>75%)	14	B: 1029, B: 799 11, B: 1322, B 2354, B: 670 I, B: 1717, B: 1693, B: 2461, B: 2464, B: 421, B: S28, B: 2504, B: 1639, B: 2039
High Head Rice Recovery percentage (>65%)	6	B: 1029, B: 799 II, B: 1389, B: 528, B: 2495, B: 2604
Kernel length (mm) (>5.5)	2	B: 1307, B: 2816
Length/Breadth ratio (upto 3)	3	B: 1389 (short slender) B: 1307 (long slender) B: 2816 (long slender)
Desirable Alkali Spreading Value (4-5 scale)	7	B: 2321, B: 1029, B: 2302, B: 1307, B: 1005, B: 2094, B: 2604

From the present experiment, the desirable accessions combination of higher yield with quality parameters were found i.e 3 accessions (B: 2039, B: 2354 and B: 1639) in high yield with high head rice recovery. 5 accessions (B: 2816. B: 2039, B: 2354, B: 1639, and B: 2094) high milling % and one (B: 094) with intermediate alkali value (Table 5)

**Table 5. Screening of accessions for desirable traits with higher yield.**

Characters	No. of accessions	Best donors
High yield with Plant height (upto 135 cm)	1	B: 1340
High yield with long panicle length (>30cm)	2	B: 2039, B: 2495
High yield with more number of effective tillers per hill ( $\geq 7$ )	2	B: 2816, B: 1639
High yield with High Head Rice Recovery%	3	B: 2039, B: 24 B: I639
High yield with High Milling %(>70%)	5	B: 2816, B: 2039, B: 2354, B: 1639, B: 2094
High yield with Desirable Alkali Spreading Value (4-5)	1	B: 2094

These indigenous aromatic rice having a lot of potential for various traits and could be used for further improvement for incorporating certain important and valuable traits. The basic study on genotypes for yield contributing characters of traditional aromatic varieties and other quality traits would help in making precised breeding strategies (Sarawgi and Bisne, 2006). These scented rice accessions B: 1340, B: 2039, B: 2495, B: 2816, B: 1693, B: 2354, B: 1639, B: 2094 may be used for different agronomical and quality traits in hybridization programme to achieve desired segregants for good grain quality with higher yield

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