

Morphological description of superior Burmese grape genotypeAKMA Hoque¹ N Mohammad² QM Ahmed¹ S Kundu³ and MS Islam⁴**Present address**

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Abstract

The research work morphological description of Burmese grape was conducted at farmers field, Shibpur, Narsingdiduring 2016-17 with seven Burmese grape germplasm where RCBD experimental design was followed. Wide variation was observed in case of growth, yield contributing characters, yield and fruit quality of the germplasm studied. The highest plant height, base girth, canopy spreading were noted from the germplasm BS Nar-002. Leaf size was noticed maximum in BS Nar-004. Maximum number of fruits/plant and yield/plant were obtained from BS Nar-002. BS Nar-002 was also free from disease whereas the other germplasm suffered from powdery mildew and sooty mould. Chaper beetle was common in case of all the germplasm. The heaviest (24.54 g) fruit was obtained from BS Nar-002, while the lightest (12.50 g) from BS Nar-006. Maximum edible portion was also recorded from BS Nar-002 (56.68 %) as compared to minimum in BS Nar-006 (39.36 %). Fruit size was the highest in BS Nar-002 (3.93×3.75 cm) followed by BS Nar-003 (3.56×3.51cm). Flesh color and texture for all the germplasm was offwhite and juicy. Maximum edible portion (56.68%) and percent TSS (16.05%) was noticed from BS Nar-002.

Keywords : Morphological, Burmese grape, Genotype, Germplasm**Introduction**

Charming minor fruit Burmese grape (*Baccaureasapida* Muell. Arg.) locally known as lotkon is grown in Narsingdi, Sylhet, Gazipur, Netrokona and Kishoregonj districts of Bangladesh. It is a commercially important minor fruit crop of Bangladesh and every year a handsome amount of lotkon is exported from Narsingdi. Indeed it is a native to Southeast Asian region and growing wild as well as under cultivation in Nepal, India, Myanmar, Bangladesh, China, Thailand, and Malaysia. It is a slow growing, evergreen, dioecious, short to medium height, shade loving plant species. Among underutilized fruit crops Burmese grape is a very potential fruit crop grown mostly in homestead condition in this region (Bhowmick 2010). It flowers during summer month and fruits are matured during rainy season. The edible portion is covered by leathery rind. The bearing habit of Burmese grape is cauliflory and fruits appear in bunch. The fruits are spheroid to oval and pale yellow- light yellow in colour when matured (Bhowmick 2010). The tree shows mild bienniality in cropping pattern (Pal *et al.* 2008). The fruit is specially grown from seed. So variability is found among different genotypes. Due to climate and

soil type mutation and segregation is always conducted. Nonetheless different genotype has significant characteristics which is also needed to be characterized. Lotkon is a commercially important fruit and is very popular among the people of all ages in Bangladesh. But there is only one recommended variety of lotkon which farmers can cultivate. Hence to reduce the demand of good varieties of lotkon this study was undertaken.

Materials and Methods

The experiment was conducted at the farmers' field of Shibpur, Narsingdi district. Seven Lotkongermplasm was included in the study. These plants are about fifteen years old and bear fruits regularly. At the beginning of the experiment the plants were rejuvenated and among of dead and diseased branches, freed them from parasitic plants, algae and lichen. Therefore, the trunks were painted with Bordeaux paste to avoid fungal infection. Each plant was fertilized with 40 kg cowdung, 400 g N, 100 g P, 350g K, 55 g S, 50 g zinc sulphate 25g boric acid in two equal splits one in the month of July and another after rainy season in the month

of October (Annon., 2012). The plants were infested by cheaper beetle twice in the month of July and September, hence two full cover sprays of Cypermethrin (Cymcare 10 EC @ 1ml/L of water) were applied. Three hand weeding was done throughout the rainy season to avoid losses of soil nutrients by seen and also to destroy the harbor of insect pests. Data were taken on growth, yield and fruit Characteristics. Fruit quality data were analyzed means were separated by STAR computer program.

Results and Discussion

A wide variation was observed in growth, yield and fruit quality of the germplasm (Table 1). The highest plant height (11.05m) was recorded from BS Nar-002 while the lowest value (4.20 m) was found from BS Nar-007. Base girth (0.21 m) was noted the highest in BS Nar-002. BS Nar-002 was also found with maximum canopy (8.50 ×8.05 m²). Dense branching with good growth condition was found in BS Nar-002 and BS Nar-006 but medium branching density with poor

growth was found in BS Nar-007 (Table 1). Irrespective of germplasm the harvesting time was observed June-July.

Leaf lamina length (19.16 cm), width (9.27 cm) and petiole length (4.20 cm) was found maximum in BS Nar-004. Branch density observed good, dense, sparse and medium in shape. For all of the germplasm growth condition is good and harvesting time is june to july.

Maximum size of fruit was observed in BS Nar-002 (3.93cm × 3.75cm) followed by BS Jai-003 (3.56×3.51cm). The other germplasm also varied significantly in respect of fruit size (Table 2). Fruit weight ranged from 12.50g to 24.54 g. The heaviest (24.54 g) fruit was obtained from BS Nar-002, while the lightest (12.50 g) from BS Nar-006. Edible portion is one of the most important features of any fruit. Maximum edible portion was recorded from BS Nar-002 (56.68%) as compared to minimum in BS Nar-006 (39.36%). The highest percent TSS was recorded in BS Nar-002 (16.05%), while the lowest was noted in BS Nar-007 (13.23%)

Table 1. Growth characteristics, and harvesting time of the different Burmese grape germplasm

Accession	Plant height (m)	Base girth (m)	Canopy (m)		Diameter at primary branching (m)
			E-W	N-S	
BS Nar-001	5.70d	0.20b	6.90c	7.75b	0.15
BS Nar-002	11.0a	0.21a	8.50a	8.05a	0.17
BS Nar-003	6.80c	0.16d	8.20a	6.36c	0.13
BS Nar-004	10.1b	0.19c	6.30c	5.90d	0.16
BS Nar-005	4.64f	0.15e	7.12b	7.25b	0.12
BS Nar-006	5.20e	0.12f	5.78d	5.30d	0.15
BS Nar-007	4.20g	0.10g	4.90e	4.40f	0.15
Level of sig.	*	*	*	*	NS
CV (%)	12.64	9.32	14.01	11.03	7.11

* indicate significant at 5% level of probability; NS:Not significant

Table 1. Continued

Accession	Leaf size (cm)			Branch density	Growth condition	Harvesting time
	Lamina length	Lamina width	Petiole length			
BS Nar-001	16.43c	6.63c	3.54	Good	Good	Jun-July
BS Nar-002	18.87b	7.87b	3.93	Dense	Good	Jun-July
BS Nar-003	18.30b	7.33b	3.06	Sparse	Good	June-July
BS Nar-004	19.16a	9.27a	4.20	Sparse	Good	Jun-July
BS Nar-005	14.83d	6.71c	3.26	Sparse	Good	Jun-July
BS Nar-006	14.56d	5.63d	3.91	Dense	Good	Jun-July
BS Nar-007	16.06c	6.33c	3.65	Medium	Poor	Jun-July
Level of sig.	*	*	NS	-	-	-
CV (%)	15.23	10.32	9.12	-	-	-

* indicate significant at 5% level of probability; NS:Not significant

The highest number of fruits/plant (3000) was obtained from BS Nar-002 compared to the lowest (1830) in BS Nar-006. The highest yield/ plant (87.50 kg) and yield (30.13 t/ha) were obtained from BS Nar-002 while the lowest value was noted in BS Nar-006 (45.75 kg/plant) and (15.58 t/ha) respectively (Table 3).

Qualitative characteristics of the Burmese grape germplasm are shown in table 4. In respect of shape all the germplasm showed spheroid fruits.

Pale yellow fruits were manifested from the germplasm of BS Nar-001, BS Nar-006 and BS Nar-007 respectively. On the otherhand, light yellow fruits were obtained from BS Nar-002, BS Nar-003, BS Nar-004 and BS Nar-005 respectively (Table 4).

No disease infection was observed in BS Nar-002 whereas the others suffered from powdery mildew and sooty mould. Chaper beetle and fruit borer was common in all the germplasm (Table 5).

Table 2. Quantitative characteristics of fruit of the different Burmese grape germplasm

Accession	Fruit size(cm)		Individual fruit wt. (g)	Flesh wt.(g)	Flesh thickness (cm)	Stone wt.(g)	No.of seed/fruit	Edible portion (%)	TSS (%)
	Length	Breadth							
BS Nar-001	3.11	2.87	15.37c	6.47b	0.28a	2.63b	3.17	40.79f	15.38
BS Nar-002	3.93	3.75	24.54a	8.92a	0.27b	1.71c	3.12	56.68a	16.05
BS Nar-003	3.56	3.51	17.41b	6.06b	0.26c	3.39a	3.83	45.72d	15.94
BS Nar-004	3.12	3.23	17.15b	6.89b	0.24d	2.74b	2.67	43.84e	14.00
BS Nar-005	3.21	2.98	15.78c	5.83c	0.16e	2.24b	3.66	48.85b	15.12
BS Nar-006	2.86	2.79	12.50e	5.02c	0.24d	2.56b	2.71	39.36g	14.96
BS Nar-007	2.90	2.97	14.51d	5.90c	0.27b	1.91c	3.10	46.17c	13.23
Level of sig.	NS	NS	*	*	*	*	NS	*	*
CV (%)	4.31	3.61	4.21	7.54	8.32	12.43	8.77	9.10	3.23

* indicate significant at 5% level of probability; NS:Not significant

Table 3. Yield performance of the different Burmese grape germplasm

Accession	No.of fruit/plant	Yield/plant (kg)	Yield (t/ha)
BS Nar-001	2600c	65.00c	22.50c
BS Nar-002	3000a	87.50a	30.13a
BS Nar-003	2550d	63.75d	22.08c
BS Nar-004	2230e	55.75e	19.31d
BS Nar-005	2720b	68.00b	23.55b
BS Nar-006	1830g	45.75g	15.58f
BS Nar-007	2100f	52.50f	18.01e
Level of sig.	*	*	*
CV (%)	23.56	18.42	14.01

* indicate significant at 5% level of probability; NS: Not significant

Table 4. Qualitative characters of fruit of the different Burmese grape germplasm

Accession	Shape	Color	Flesh color	Flesh texture
BS Nar-001	Spheroid	Pale yellow	Off-white	Juicy
BS Nar-002	Spheroid	Light yellow	Off-white	Soft Juicy
BS Nar-003	Spheroid	Light yellow	Off-white	Juicy
BS Nar-004	Spheroid	Light yellow	Off-white	Soft Juicy
BS Nar-005	Spheroid	Light yellow	Off-white	Juicy
BS Nar-006	Spheroid	Pale yellow	Off-white	Juicy
BS Nar-007	Spheroid	Pale yellow	Off-white	Juicy

Table 5. Disease and insect pests of the different Burmese grape germplasm

Accession	Disease incidence	Insect pest infestation
BS Nar-001	Powdery mildew, Sooty mould	Cheaper beetle, fruit borer
BS Nar-002	Nil	Cheaper beetle, fruit borer
BS Nar-003	Powdery mildew, Sooty mould	Cheaper beetle, fruit borer
BS Nar-004	Powdery mildew, Sooty mould	Cheaper beetle, fruit borer
BS Nar-005	Powdery mildew, Sooty mould	Cheaper beetle, fruit borer
BS Nar-006	Powdery mildew, Sooty mould	Cheaper beetle, fruit borer
BS Nar-007	Powdery mildew, Sooty mould	Cheaper beetle, fruit borer

Conclusion

Contemplating yield, edible portion, TSS, disease and insect infestation for two year the germplasm BS Nar-002 showed the best among the germplasm.

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