

Physico-chemical Properties of Burmese Grape (*Baccaurea Sapida* Muell. Arg.)- An underutilized Fruit Crop of West Bengal

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Abstract

Burmese grape (*Baccaurea sapida* Muell. Arg.) is an underexploited fruit crop grown mainly backyard plantation and as forest plant. It is native to the South East Asian region. In West Bengal the fruits are grown mainly homestead condition in northern parts of states; i.e., Cooch Behar, Jalpaiguri, Darjeeling districts. Locally the fruit is known as 'Latka'. It is a mild acidic fruit and mainly used as fresh fruit consumption. It flowers during the summer months and fruits are mature in rainy season. Bearing habit of Burmese grape is adventitious or cauliflory in nature. The fruit is oval to round in shape and turns yellow or yellowish brown in ripen condition. The type of fruit is berry and edible portion is aril which is covered by leathery rind. Burmese grape is propagated by seeds and as it is dioecious in nature so variation is present among the present plant population. In the present study, an attempt has been made to evaluate the physical and biochemical properties of different Burmese grape genotypes in northern parts of West Bengal. The present investigation was carried out with twelve germplasms. The data represented from the experiment revealed that the germplasms varied among themselves regarding different physical and biochemical attributes of fruits in fully ripe condition. The maturity for fruit harvesting is least in Accession No. 9 (78.33 days) followed by Accession No. 8 (80.66 days) and it is maximum (90.33 days) for the Accession No. 7. For most of the desirable attributes, the Accession No. 11 showed better response like

maximum length (3.383 cm), diameter (3.513 cm), weight (19.93 gm), juice content (74.10 ml/10 fruit) and lowest acidity (1.996%).

Keywords: Burmese grape, Physico-chemical, underutilized fruit.

1. Introduction

Burmese grape (*Baccaurea sapida* Muell. Arg.) is an under exploited fruit crop grown mainly backyard plantation and as forest plant. The generic name is derived from Latin 'baccaurea' referring to the golden-yellow colour of the fruits (Chakrabarty and Gangopadhyay, 1997). It is native to the South East Asian region. The tree is found wild or cultivated in the sub-Himalayan tract in eastern India from Bihar to Arunachal Pradesh and in the lower hills and valleys of Meghalaya, Assam, Nagaland, Manipur, Mizoram, Tripura and Orissa, ascending to an altitude of 900 m, and in Andaman and Nicobar Islands, chiefly in the moist tropical forests (Anon., 1988). In West Bengal the fruits are grown mainly homestead condition in northern parts of states; i.e., Cooch Behar, Jalpaiguri, Darjeeling districts. Locally the fruit is known as 'Latka', or 'Latkan' or 'Lotko' or 'Notko'. It is a mild acidic fruit and mainly used as fresh fruit consumption. The tree is dioecious, evergreen, shade loving plant. It flowers during the summer months and fruits are mature in rainy season. Bearing habit of Burmese grape is adventitious or cauliflory in nature (Bhowmick, 2011). The fruit is oval to round in shape and turns yellow or yellowish brown in ripen condition. The type of fruit is berry and edible portion is aril which is covered by leathery rind. Burmese grape is propagated by seeds and as it is dioecious in nature so variation is present among the present plant population. No improved cultivar or prominent types are available or scientifically documented in the literature for this region.

Burmese grape is an underutilized fruit crop and still now there is very limited literature available regarding the genotypes of Burmese grape and its physico-chemical properties. In the present study, an attempt has been made to evaluate the physical and bio-chemical properties of different Burmese grape genotypes northern parts of West Bengal as well as an attempt was made to know the maturity period of different Burmese grape accession.

2. Materials and Methods

The present investigation was carried out with twelve accession of Burmese grape germplasms (denotes as ACC 1-12 in tables) grown on the farmers house hold nearer to the Uttar Banga Krishi Viswavidyalaya during 2008-2009. All the plants aged between ten to fifteen years and were well grown, free from pests and diseases. While selecting the germplasm it is kept in mind that the collar diameter and the canopy of the selected accession were similar. After fruit set, the required fruit bunches were tagged on all sides to obtain uniform result. The fruits were harvested and subjected for studies on physico-chemical changes during ripen stage. Three fruit bunches were

harvested randomly from each selected plant and ten fruits of each bunch were taken to the Department of Pomology and Post Harvest Technology, Uttar Banga Krishi Viswavidyalaya to observe the fruit length (cm), fruit diameter (cm), fruit weight (g), peel weight (g), peel thickness (mm) in average and 10 seed weight (g), juice content (ml/10 fruits). The total soluble solids (TSS) of the fruits measured with hand refractometer. Total sugar content and titratable acidity were determined with standard of A.O.A.C.(1984). To determine the maturity of Burmese grape 10 inflorescences each from four direction of the each accession were tagged and days taken for maturity was recorded by the simple computation methods by counting the days after fruit set of each inflorescences upto the maturity. The observations were analyzed in simple Randomized Block Design as suggested by Gomez and Gomez (1983).

3. Result and Discussion

The data represented from the experiment revealed (Table 1) that the germplasms varied among themselves regarding different physical and biochemical attributes of fruits in fully ripe condition as well as the maturity days. The maturity for fruit harvesting is least in Accession 9 (78.33 days) followed by Accession-8 (80.66 days) and it is maximum (90.33 days) for the Accession-7. The length (3.383 cm) and diameter (3.513 cm) of the fruit was maximum in Accession 11 followed by (3.306 cm and 3.420 cm, respectively) in Accession-6 of Cooch Behar district. The length was lowest (2.876 cm) in Accession-7 which is statistically at par with Accession-12. The fruit weight was maximum (19.93 g) in Accession-11 followed by Accession-6 and it was minimum in Accession 12. The undesirable horticultural traits like peel weight, peel thickness and seed weight was also recorded in this present study. Peel weight was recorded minimum (4.75g) in ACC-12 and it was found maximum in ACC-11 (6.10 g). The peel thickness and seed weight were non significant among the different accession studied under the present investigation.

Table 1: Maturity period and fruit physical characters of Burmese grape.

Germplasm	Maturity (Days from flowering)	Length (cm)	Diameter (cm)	Weight (g)	Peel weight (g)	Peel thickness (mm)	10 Seed weight (g)
ACC-2	86.66	3.030	3.116	16.23	5.11	2.02	5.11
ACC-3	84.66	2.933	3.070	15.75	4.87	2.04	4.52
ACC-4	87.66	3.270	3.413	18.14	5.79	2.02	4.68
ACC-5	87.66	3.050	3.143	16.88	5.62	1.99	5.19
ACC-6	81.60	3.306	3.420	19.21	6.05	2.05	5.02
ACC-7	90.33	2.866	3.080	15.35	4.80	2.07	5.07
ACC-8	80.66	3.236	3.386	18.28	5.73	2.08	4.83

ACC-9	78.33	3.140	3.296	18.49	5.56	2.01	4.87
ACC-10	92.00	3.283	3.403	19.10	5.91	1.99	5.20
ACC-11	83.33	3.383	3.513	19.93	6.10	2.04	5.33
ACC-12	85.33	2.876	3.050	15.23	4.75	2.02	5.23
SE+m	0.761	0.038	0.041	0.080	0.07	-	-
CD^{0.05}	1.881	0.065	0.075	0.148	0.12	NS	NS

The data from Table 2 revealed the juice content of the fruit varied statistically significant among the germplasm surveyed and it was maximum (74.10 ml/10 fruits) in Accession-11 followed by Accession-6 and it is least in Accession-12. The total soluble solids (TSS) and total sugar were also varied significantly among the germplasm studied. The TSS was maximum (13.12) in Accession-11 followed by Accession-6 (12.93). Burmese grape is an acidus fruit, however, the low acidity is the desirable characteristics for local fresh consumption. It is found from the present study that the Accession-11 recorded with least acidity (1.996%).

Table 2: Fruit quality characters of Burmese grape.

	Juice content (ml/10 fruits)	Acidity (%)	Total sugar (%)	TSS (°Brix)
ACC-1	68.10	2.133	4.08	12.33
ACC-2	60.66	2.046	4.11	11.64
ACC-3	57.10	2.203	4.06	12.85
ACC-4	68.46	2.086	4.07	12.13
ACC-5	62.73	2.083	4.04	12.21
ACC-6	72.30	2.023	4.17	12.93
ACC-7	54.66	2.236	4.01	11.75
ACC-8	65.50	2.056	4.10	11.52
ACC-9	63.73	2.043	4.17	12.62
ACC-10	70.46	2.010	4.21	12.88
ACC-11	74.10	1.996	4.26	13.12
ACC-12	53.80	2.013	4.29	12.72
SE+m	0.504	0.051	0.018	0.057
CD^{0.05}	0.908	0.112	0.032	0.121

For most of the desirable attributes the Accession no. 9 showed better response like maximum length (3.383 cm), diameter (3.513 cm), weight (19.93 gm), juice content (74.10 ml/10 fruit) and lowest acidity (1.996%). Among the twelve germplasms, Accession no-12 showed inferior quality for most of the horticultural traits. Bhowmick *et al* (2013) reported that Burmese grape can be harvested 80-85 days after fruit set for best dessert quality. In an investigation Bhowmick *et al* (2009) reported that fruit

weight and TSS was varied from 8.09 -21.52 g and 15-20.8, respectively, in different litchi germplasm.

4. Conclusion

The present investigation revealed that the Accession no 11 germplasm of Burmese grape is superior among the different germplasm surveyed during this study in terms of most of the desirable horticultural traits like highest fruit length, diameter, weight, juice content, lowest acidity as well as it has quite high amount of total sugar, and total soluble solids in this locality. Accession no-11 would be further studied for confirming its superiority in multi-location.

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