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## FRUIT CHARACTERISTICS, YIELD CONTRIBUTING CHARACTERS AND YIELD OF SOME LOTKON GENOTYPES UNDER NORTH EASTERN REGION OF BANGLADESH

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### ABSTRACT

Rahman SML, Bhuyan MHMB, Mustakim AAMM, Sarker JC, Hussain MA (2014) Fruit characteristics, yield contributing characters and yield of some lotkon genotypes under north eastern region of Bangladesh. *Int. J. Sustain. Crop Prod.* 9(1), 8-10.

A study on the fruit characteristics, yield contributing characters and yield of five promising lotkon genotypes was carried out at the fruit Research Farm and Laboratory of Citrus Research Station, Bangladesh Agricultural Research Institute, Jaintiapur, Sylhet, during fruiting season of 2013. Five promising lines of lotkon viz., BS-Jai 001, BS-Jai 002, BS-Jai 003, BS-Jai 004 and BS-Jai 005 were included in the study. A wide variation was observed among the genotypes in respect of different characteristics under the present study. Per cent edible portion and total soluble solids (TSS%) were the highest in BS-Jai 001 (47.2% and 13.6%, respectively) while the lowest edible portion in BS-Jai 002 (36.7%) and the lowest TSS in BS-Jai 003 (12.4%). Heaviest (15.2 g) fruits with length and diameter of 3.4 cm and 3.4 cm was recorded from the genotype BS-Jai 003 whereas the lightest (8.6 g) with length and diameter of 2.2 cm and 2.7 cm was noted in BS-Jai 004. The highest number of fruits per plant (6000) as well as highest yield per plant (55.4 kg/plant) and per hectare (56.8 t/ha) were produced from the genotype BS-jai 005. BS-Jai 001 found superior in respect of fruit attractiveness, color, juiciness, flesh texture and eating quality.

**Key words:** *genotypes, burmese grape*

### INTRODUCTION

Lotkon or Burmese grape (*Baccaurea sapida* Muell. Arg.) belongs to the Family Euphorbiaceae is native to Southeast Asian region and growing wild as well as under cultivation in Nepal, India, Myanmar, Bangladesh, South China, Indo-China, Thailand, The Andaman Island and Peninsular Malaysia. In Bangladesh the species is grown in some pockets in Narsingdi, Manikgonj, Gazipur, Netrokona, Kishoregonj and Sylhet. Lotkon is a commercially important fruit is very popular to people of all ages in Bangladesh.

Fruits contain 5.5 percent protein, 178 mg vitamin C per 100 g of pulp and among the minerals, the fruit contains 169 mg calcium, 137 mg potassium, 177 mg phosphorous, and 100 mg iron per 100 g of fruit pulp (Kermasha *et al.* 1987). Fruit is generally being consumed as fresh. It is also reported from other parts of the world that lotkon fruits are used to make wine, and has been used as medicinally to treat skin disease. The peels of mature but unripe fruits yield 14.1 percent pectin and this pectin is useful in preparation of jellies and jams (Annon. 1988). Seeds of this fruit contain 4.8–6 per cent annatto dye. Annatto is used for coloring silk, cotton and other textile materials for orange color (Abdullah *et al.* 2005). Lotkon is mainly available during the month of June–July and price is slightly high during the time of Rathayatra as because the fruit is profusely used by the local people for ritual. This fruit crop prefers shade or semi shade condition for growth and development. So, it can be grown under another fruit crop or forest crop, where no other fruit crop can be grown successfully (Bhowmick 2010). This is why it can be a component of multistoried fruit garden. By growing this crop the farmers are now receiving considerable amount of money to meet their family demand, moreover apparently vacant space can be effectively utilized for fruit production which may help to meet their dietary supplement. But still there is only one recommended variety of lotkon which farmers can cultivate. Therefore, to reduce the demand of good varieties of lotkon, this study was undertaken.

### MATERIALS AND METHODS

The study was conducted at the orchard of Citrus Research Station, Bangladesh Agricultural Research Institute, Jaintiapur, Sylhet during the period from July 2012 to July 2013. Five lotkon genotypes viz., BS-Jai 001, BS-Jai 002, BS-Jai 003, BS-Jai 004 and BS-Jai 005 were included in the study. The plants were healthy, about 25 years of age and received similar cultural treatments and bear fruits regularly. At the beginning of the study, the plants were rejuvenated by pruning of dead and diseased branches, freed them from parasitic plants, algae and lichen. The trunks of the trees were painted with Bordeaux paste to avoid fungal infection. The plants were fertilized with 30 kg cow dung, 1 kg urea, 1 kg TSP, 750 g MoP, 200 g gypsum, 50 g Zinc sulphate and 20 g boric acid in two equal splits; one in the month of May and another after rainy season in the month of October (FRG 2012). The plants were sprayed with Cypermethrin (Cymcare 10 EC @ 1ml/L of water) to control chapper beetle whereas tilt was sprayed @ 0.5 ml/l for controlling powdery mildew disease. Three hand weeding were done throughout the rainy season to avoid loses of soil nutrients by weed and also to destroy the harbor of insect pests. Data were recorded on yield contributing characters, yield and fruit characteristics. Data were analyzed by MSTAT-C computer programme and DMRT was performed for interpretation of results (Gomez and Gomez, 1984).

## RESULTS AND DISCUSSION

The quantitative and qualitative characteristics of the lotkon genotypes are presented in Table 1 and Table 2, respectively. The fruits of all genotypes became harvestable between 25 June to 27 July, 2013. The genotype BS-Jai 002 was the earliest and BS-Jai 003 was the latest in respect of harvesting time. Wide range of variability was observed among the genotypes under study in respect of different physico-chemical characteristics of fruits. Fruit weight of the different genotypes varied from 8.6 to 15.2 g (Table 1). The heaviest fruit was recorded from BS-Jai 003 (15.2 g) followed by BS-jai 001 (14.6 g) and BS-Jai 002 (14.2 g). The lightest fruit was obtained from BS-Jai 004 (8.6 g). The length and diameter of fruits varied from 2.2 to 3.4 cm and 2.7 to 3.4 cm, respectively. The highest percentage of edible portion (47.2%) was obtained from BS-Jai 001 closely followed by BS-Jai 003 (47.1%) and BS-Jai 004 (46.5%). Among the genotypes studied, BS-Jai 001 had the highest total soluble solid content (13.6%) which was closely followed by BS-Jai 004 (13.5%) and BS-Jai 005 (13.4%).

The colors of ripe fruits of the genotypes were yellowish green, light yellow and yellow while the flesh colors of fruits of all the genotypes were off white. Fruit shapes of all the genotypes were spheroid while fruit skin were thin, medium thick and thick. Flesh textures of all the genotypes were juicy, while fruit attractiveness of the genotypes was good, intermediate and excellent. Eating quality of the fruits of the genotypes was good to intermediate.

Table 1. Quantitative characteristics of fruits of five lotkon genotypes

Treatment	Date of harvest	Fruit weight (g)	Fruit size (cm)		Edible portion (%)	TSS (%)
			Length	Diameter		
BS-Jai 001	03 July	14.6 a	3.3 ab	3.1 b	47.2 a	13.6 a
BS-Jai 002	25 June	14.2 a	3.1 b	3.0 b	36.7 b	13.2 a
BS-Jai 003	27 July	15.2 a	3.4 a	3.4 a	47.1 a	12.4 b
BS-Jai 004	10 July	8.6 b	2.2 c	2.7 c	46.5 a	13.5 a
BS-Jai 005	18 July	14.2 a	3.1 b	3.1 b	38.6 b	13.4 a
LSD	-	0.9597	0.1847	0.2024	3.673	0.5694
CV%	-	3.96	3.24	3.57	6.33	2.33

In a column means followed by common letters are not significantly different from each other at 5% level of probability by DMRT

All the genotypes varied significantly in terms of yield contributing characters and yield of fruits (Table 3). The maximum number (6000) of fruits per plant was recorded in the genotype BS-Jai 005 and the minimum (600) was noted in BS-Jai 004. The maximum yield of 55.4 kg/plant was obtained from the genotype BS-Jai 005 whereas the minimum of 5.2 kg/plant was recorded from BS-Jai 004. The yield of 56.8 t/ha was noted from the genotype BS-Jai 005 closely followed by the genotype BS-Jai 001 (52 t/ha) whereas the lowest yield of 6.1 t/ha was recorded from BS-Jai 004. Pal *et al.* (2008) in his study found 3–4 seeds per fruit. The average fruit weight, peel weight was 9.0 g and 3.75 g respectively. Fruit shows around 10° brix TSS, 4.42 percent total sugar and 2.1 percent acidity. Average yield varies from 70–80 kg/plant/year which is very close to the present study.

Table 2. Qualitative characteristics of five lotkon genotypes

Treatments	BS-Jai 001	BS-Jai 002	BS-Jai 003	BS-Jai 004	BS-Jai 005
Fruit shape	Spheroid	Spheroid	Spheroid	Spheroid	Spheroid
Skin thickness	Medium thick	Thick	Medium thick	Thin	Thick
Fruit attractiveness	Excellent	Good	Intermediate	Intermediate	Good
Fruit color at ripen	Yellow	Yellow	Light yellow	Yellowish green	Light yellow
Flesh color	Off white	Off white	Off white	Off white	Off white
Flesh texture	Juicy	Juicy	Juicy	Juicy	Juicy
Eating quality	Good	Good	Intermediate	Intermediate	Intermediate

All the genotypes were infested with powdery mildew and shooty mould disease except BS-Jai 001. The genotype BS-Jai 001 and BS-Jai 003 were free from fruit borer but all other were attacked by chapper beetle. According to Pal *et al.* 2008; matured Burmese grape fruits are roundish to oval in shape, turns yellow or yellowish brown in color at ripening and fruits are available during the rainy season which corroborates with the present study. He also found some extent of mild bienniality in cropping pattern.

Table 3. Yield contributing characters, yield and disease and insect infestation of five different lotkon genotypes

Accessions	No of fruits/plant	Yield/plant (Kg)	Yield (t/ha)	Disease	Insect
BS Jai-001	5200.0 b	49.50 b	52.0 b	Nil	Chapper beetle
BS Jai-002	1200.0 d	18.60 d	19.9 d	Powdery mildew, Sooty mould	Chapper beetle, fruit borer
BS Jai-003	1750.0 c	24.30 c	26.3 c	Powdery mildew, Sooty mould	Chapper beetle
BS Jai-004	600.0 e	5.20 e	6.10 e	Powdery mildew, Sooty mould	Chapper beetle, fruit borer
BS Jai-005	6000.0 a	55.40 a	56.8 a	Powdery mildew, Sooty mould	Chapper beetle, fruit borer
LSD	154.3	0.2450	1.308	-	-
CV(%)	1.91	0.30	1.48	-	-

In a column, means followed by common letters are not significantly different from each other at 5% level of probability by DMRT

### CONCLUSION

Considering the overall quantitative and qualitative characteristics along with yield of the fruits of all the studied genotypes, BS-Jai 001 and BS-Jai 005 were found to be superior to other genotypes in respect of fruit weight, number of fruits per plant, weight of fruits per plant, fruit TSS (%), fruit size and yield per hectare. These genotypes deserve a place in any lotkon varietal trial for selecting superior varieties.

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