



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.23

TPI 2022; 11(2): 976-979

© 2022 TPI

www.thepharmajournal.com

Received: 18-11-2021

Accepted: 29-01-2022

Santosh Kumar

Department of Horticulture
Fruit and Fruit Technology,
Bihar Agricultural University,
Sabour, Bhagalpur, Bihar, India

Md. Feza Ahmad

Department of Horticulture
Fruit and Fruit Technology,
Bihar Agricultural University,
Sabour, Bhagalpur, Bihar, India

Sanjay Sahay

Department of Horticulture
Fruit and Fruit Technology,
Bihar Agricultural University,
Sabour, Bhagalpur, Bihar, India

Muneshwar Prasad

K.V.K. Banka, Bihar, India

Samik Sengupta

Department of Horticulture
Fruit and Fruit Technology,
Bihar Agricultural University,
Sabour, Bhagalpur, Bihar, India

Studies on variability of morphological features of different genotypes of Jamun (*Syzygium cumini* Skeels)

Santosh Kumar, Md. Feza Ahmad, Sanjay Sahay, Muneshwar Prasad and Samik Sengupta

Abstract

A survey on morphological variability of Jamun was conducted at five district of Bihar with objective to determine prominent genotype of Jamun for higher yield and related attributes. The data of twenty-two genotypes were recorded like leaf length, leaf width, leaf length-width ratio, internodal length, petiole length Inflorescence length, Inflorescence diameters, Inflorescence length-diameter ratio, number of panicles per tree, number of fruits per panicles, yield per panicle. The study found wide range of variation in Jamun. Maximum leaf length (20.71 cm) and internodal length (7.48 cm) were found in V3 while leaf- width was found maximum in BK3 (7.69cm). Maximum leaf length-width ratio was found in S3 (3.76 cm) while petiole length was found maximum in V2 (2.57 cm). Maximum inflorescence length was found in BG1 (16.18 cm). Maximum inflorescence diameters was found in BK1 (6.65 cm), maximum inflorescence length- diameter ratio was found in V4 (4.04 cm), maximum number of panicles per tree were recorded in BK3 (880), number of fruits per panicles were recorded highest in BK3 (37.61 cm) while maximum yield per panicle was recorded in BK3 (0.45kg). On the basis of overall performance, BK3 genotypes were found to be most promising and best performing genotypes.

Keywords: Jamun, genotypes, morphology, yield

Introduction

Jamun (*Syzygium cumini*. Skeels.) is an important indigenous minor fruit belongs to the family Myrtaceae native to Indonesia and India. It is a huge, evergreen fruiting tree that grows in a variety of agro climatic conditions in eastern region of India (Gajera *et al.* 2017) [4]. It is grown for commercial purposes in many tropical countries like West Indies, East and West Africa and certain subtropical countries such as Florida, Algeria, California and Israel. It is grown in India from the Indo-Gangetic plains to the lower Himalayan ranges and Kumaon hills in the north to Tamil Nadu in the south. Information relating to area and production of Jamun in India is still not available because it is rarely planted in the orchards of perennial fruit crops and generally dispersed trees are found in fruit plantations. However, Jamun is distributed naturally throughout the tropical and subtropical regions of India. Jamun cultivation is gaining popularity all over the world as a source of food security and due to its immense variability; its morphological description appeared utility wise for future economic viability. Jamun trees are majorly grown of seedling origin; they show wide range of variation in their morphology and chemical attributes (Keskar *et al.*, 1989, Geetha *et al.*, 1992) [7, 5]. In Bihar, wide range of Jamun plants are found but not categorized for commercial cultivation. In light of this, an attempt has been undertaken to characterize the different morphological characters of identified germplasm collected from different parts of Bihar.

Materials and Methods

Experimental material and location

This experiment was conducted at Bihar Agriculture College, Sabour, Bhagalpur during 2020-21. Total twenty-two genotypes were collected from five different district of Bihar (Samastipur, Patna, Banka, Vaishali and Bhagalpur) for investigation of morphological charecterization.

The Leaf length (cm) was measured by measuring scale of average 10 leaves.

The Leaf width (cm) was measured with the help of a scale at the widest point of 10 leaves.

Leaf length width ratio was calculated by dividing leaf length by leaf width of ten mature leaf.

Internodal length (cm) was measured by Vernier caliper of 10 matured leaf.

Corresponding Author:

Santosh Kumar

Department of Horticulture
Fruit and Fruit Technology,
Bihar Agricultural University,
Sabour, Bhagalpur, Bihar, India

Petiole length (cm) was measured by measuring scale of 10 mature leaves from stem to the base of leaf blade.

Inflorescence Length (cm) was measured by measuring scale in cm.

Inflorescence diameter (cm) was measured by a measuring scale and represented in cm

Inflorescence length-diameter ratio was calculated by dividing inflorescence length by inflorescence diameter.

Number of panicles per tree was calculated by counting the panicles in individual tree from all the direction.

Number of fruits per panicles was calculated by counting total number of fruits per panicles from 10 randomly selected panicle.

Yield per panicle (kg) was calculated by average weight of fruit multiplying by number fruit per panicle (g) divided by 1000.

Data of morphological parameters of 22 Jamun genotypes were characterized according to the descriptors prescribed for Jamun (PPV & FRA 2015).

Results and Discussion

The data pertaining to leaf length of different genotypes of Jamun was recorded to be 15.72 ± 2.71 cm revealing that wide range of leaf length (11.50 to 20.71 cm) having coefficient of variation 17.24%. (Table-1). The highest leaf length was found in V3 (20.71 cm) genotype collected from Vaishali district followed by S4 (20.19 cm), BG2 (19.80 cm), V2 (18.85 cm) genotype collected from Samastipur, Bhagalpur and Vaishali district respectively. However, the lowest leaf length was observed in BG3 (11.50 cm) genotypes selected from Bhagalpur district followed by BK4 (12.46 cm), P3 (13.34 cm) and S1 (13.51 cm) genotype collected from Banka, Patna and Samastipur district respectively. Whereas, the mean value of leaf width of different Jamun was recorded to be 6.70 ± 0.90 cm that ranged from 3.93 to 7.69 m having coefficient of variation 13.37%. The highest leaf width was observed in V3 (20.71 cm) genotype documented from Vaishali district followed by S4 (20.19 cm), BG2 (19.80 cm) and V2 (18.85 cm) respectively. Whereas the lowest leaf width was observed in BG3 (11.50 cm) genotypes collected from Bhagalpur followed by BK4 (12.46 cm), P3 (13.34 cm) and S1 (13.51 cm) genotype registered from Banka, Patna and Samastipur respectively. The leaf length width ratio was found to be 2.39 ± 0.55 cm that ranged from 3.76 to 1.71 with coefficient of variation 23.03%. The largest leaf length width ratio was found in S3 (20.71 cm) genotype selected from Samastipur followed by BG2 (3.57), V3 (3.01) registered from Bhagalpur and Vaishali respectively. Whereas, the lowest leaf length width ratio was observed in BK4 (1.71) genotypes followed by BK5 (1.74), BK1 (1.77) respectively presented in table- 1. The data presented in table-2 show wide range of Internodal length (6.34 ± 0.72), varied from 4.44 to 7.48 cm having coefficient of variation 11.41%. The highest Internodal length was recorded in V3 (7.48 cm) genotype collected from Vaishali district followed by BG2 (7.32 cm) and S5 (7.07) respectively. However, the lowest Internodal length was observed in S1 (4.44 cm) genotypes registered from Samastipur followed by S2 (4.77 cm) and S3 (5.54 cm) respectively. The petiole length was found to be 2.04 ± 0.38 that ranged from 2.57-1.25 cm with coefficient of variation 18.55%. The maximum petiole length was recorded in V2 (2.57 cm) genotype selected from Vaishali district followed

by V1 (2.56 cm), P1 (2.43 cm) genotype collected from Vaishali and Patna district respectively. While the minimum petiole length have been found in BG3 (1.25 cm) genotype registered from Bhagalpur followed by BG1 (1.37 cm), P1 (1.40 cm) genotype selected from Bhagalpur and Patna district respectively. These findings have been found in proximity with Fivaz (2008) [3], Anushma *et al.* (2018) [1] and Singh *et al.* (2019) [9].

The data presented in table-2 clearly show wide mean value of inflorescence length (15.07 ± 0.78 cm) ranged from 12.98-16.18 cm, having coefficient of variation 5.17%. The maximum number of inflorescence length was noticed in BG1 (16.18 cm) genotype collected from Bhagalpur followed by BK4 (15.88 cm), S1 (15.82 cm) genotype put on record from Banka and Samastipur district. While the smallest inflorescence length was examined in P1 (12.98 cm) genotype selected from Patna followed by BK2 (13.66 cm), V3 (13.98 cm) genotype collected from Banka and Vaishali districts respectively while Inflorescence diameter were recorded to be 4.43 ± 0.85 which varied from 3.68 to 6.65 cm) with coefficient of variation 19.09%. The maximum inflorescence diameter was observed in BK1 (6.65 cm) genotype registered from Banka followed by BK2 (6.25 cm), BK5 (6.13 cm) genotypes while the minimum inflorescence diameter was recorded in V4 (3.68 cm) genotype collected from Vaishali district followed by V3 (3.77 cm), V1 (3.80 cm) genotypes. The Inflorescence length diameter ratio was evaluated to be 3.51 ± 0.54 cm that ranging from 2.18 to 4.04 having coefficient of variation 15.40%. The highest inflorescence length diameter ratio was found in V4 (4.04) genotype selected from Vaishali followed by P2 (3.92 cm) and BG2 (3.86 cm) genotype registered from Patna and Bhagalpur district while the smallest inflorescence length diameter ratio has been recorded in BK2 (2.18) genotype collected from Banka district followed by BK1 (2.35) and BK5 (2.45) genotypes. This findings are in accordance to the results of Singh *et al.* (2012) [10].

The data presented in table-3 showed wide range of variation in respect to number of panicles per tree (638.16 ± 110.26), ranged from 444 to 880 having coefficient of variation (17.28%). Number of panicle per tree was recorded highest in BK3 (880) genotype collected from Banka district followed by V4 (848), BK1 (780) and BK2 (748) genotypes collected from Vaishali and Banka district, while the lowest number of panicle per tree was recorded in BG3 (444) genotype selected from Bhagalpur district followed by S1 (498), S4 (512) genotype selected from Samastipur district. This was accordance to the finding of Mishra *et al.* (1975), Anushma *et al.* (2018) [1] and Devi *et al.* (2016). The number of fruits per panicle was found to be 26.65 ± 8.60 that ranged from 11.16 to 37.61 with coefficient of variation 32.27%. The maximum number of fruit per panicle was observed in BK3 (37.61) genotype registered from Banka district followed by BG1 (36.47), BK2 (36.22) genotype collected from Bhagalpur and Banka district respectively while the minimum number of fruit per panicle was reported in BG3 (11.16) genotypes collected from Bhagalpur district followed by S1 (12.06) and S3 (16.56) genotype registered from Samastipur district. This was accordance to the findings of Hemavathi *et al.* (2019) [6].

Table 1: Leaf length, leaf width and leaf length: width ratio, Internodal length and petiole length of different genotypes of Jamun tree

Genotype	Leaf length (cm)	Leaf width (cm)	Leaf length: Width ratio	Internodal length (cm)	Petiole length (cm)
S1	13.51	5.97	2.26	4.44	2.31
S2	15.63	5.82	2.69	4.77	2.24
S3	14.75	3.93	3.76	5.54	2.18
S4	20.19	7.68	2.63	6.31	2.27
S5	13.94	6.93	2.01	7.07	2.08
P1	18.71	7.00	2.67	7.04	2.43
P2	15.99	7.22	2.10	6.77	1.40
P3	13.34	6.33	2.11	6.18	2.38
P4	14.53	7.10	2.05	5.90	2.13
P5	16.02	6.92	2.32	6.70	1.99
BK1	12.90	7.29	1.77	6.42	1.87
BK2	13.53	7.62	1.78	6.35	2.04
BK3	13.73	7.69	1.79	6.67	2.27
BK4	12.46	7.27	1.71	6.03	1.67
BK5	12.95	7.44	1.74	6.43	2.08
V1	18.51	6.77	2.74	6.83	2.56
V2	18.85	7.44	2.53	6.43	2.57
V3	20.71	6.88	3.01	7.48	2.31
V4	17.55	7.04	2.49	5.73	2.17
BG1	16.78	6.20	2.71	6.77	1.37
BG2	19.80	5.55	3.57	7.32	1.45
BG3	11.50	5.43	2.11	6.40	1.25
Mean	15.72	6.70	2.39	6.34	2.04
St. Dv.	2.71	0.90	0.55	0.72	0.38
C.V (%)	17.24	13.37	23.03	11.41	18.55

Table 2: Inflorescence length, inflorescence diameter and inflorescence length: diameter ratio of different genotypes of Jamun tree

Genotype	Inflorescence length (cm)	Inflorescence diameter (cm)	Inflorescence length: diameter ratio
S1	15.77	3.92	4.04
S2	15.81	4.24	3.74
S3	15.37	4.34	3.54
S4	15.74	4.11	3.84
S5	14.80	3.98	3.73
P1	12.98	3.94	3.32
P2	15.07	3.92	3.92
P3	15.26	3.86	4.02
P4	15.53	4.34	3.41
P5	15.71	4.40	3.58
BK1	15.69	6.65	2.35
BK2	13.66	6.25	2.18
BK3	15.38	4.82	3.20
BK4	15.88	5.35	2.98
BK5	14.99	6.13	2.45
V1	14.40	3.80	3.82
V2	14.59	3.99	3.67
V3	13.98	3.77	3.73
V4	14.65	3.68	4.04
BG1	16.18	4.19	3.87
BG2	15.45	4.01	3.86
BG3	14.77	3.85	3.86
Mean	15.07	4.43	3.51
St. Dv.	0.78	0.85	0.54
C.V (%)	5.17	19.09	15.40

Table 3: Number of panicle/tree, number of fruits/panicle and yield/panicle of different genotypes of Jamun tree.

Genotype	No. of panicle/tree	No. fruits/panicle	Yield/panicle(kg)
S1	498	12.06	0.09
S2	522	20.66	0.16
S3	528	16.56	0.13
S4	512	15.89	0.13
S5	540	19.83	0.15
P1	611	20.73	0.15
P2	625	26.26	0.20
P3	534	19.13	0.14
P4	712	37.50	0.29
P5	631	21.75	0.15
BK1	780	35.74	0.42
BK2	748	36.22	0.44
BK3	880	37.61	0.45
BK4	682	34.63	0.35
BK5	659	32.89	0.36
V1	647	27.49	0.22
V2	627	26.68	0.22
V3	647	26.69	0.22
V4	848	35.86	0.29
BG1	695	36.47	0.32
BG2	677	34.54	0.31
BG3	444	11.16	0.08
Mean	638.16	26.65	0.24
St. Dv	110.26	8.60	0.11
C.V (%)	17.28	32.27	46.46

Acknowledgment

Authors are thankful to Dr S.S Mahesh, Technical assistant, BAC Sabour for laboratory support and Mr. Amit Raj, Technical Assistant for manuscript edition.

Conclusions

From above finding it can be concluded that BK3 was most promising and best performing genotypes among all genotypes and can be exploited for further research and commercial production.

References

- Anushma PL, Anuradha Sane. Assessing variability in morphological traits of jamun (*Syzygium cumini* (L.) Skeels) genotypes. *Journal of Plant Development Sciences*. 2018;10(11):629-632.
- Devi CA, Swamy GSK, Naik N. Studies on flowering and fruit characters of jamun genotypes (*Syzygium cumini* Skeels). *Biosciences Biotechnology Research Asia*. 2016;13(4):2085-2088.
- Fivaz J. Botanical aspects. In: de Villiers, EA, Joubert, PH. (Eds.), *The Cultivation of Mango*. ARC Institute for Tropical and Subtropical Crops, Florida, USA. 2008, 9-20.
- Gajera HP, Shila N Gevariya, Patel SV, Golakiya BA. Nutritional profile and molecular fingerprints of indigenous black jamun (*Syzygium cumini* L.) landraces. *Journal Food Science and Technology*. 2017;55(2):730-739.
- Geetha CK, Babylatha AK, Mathew KL, George ST. Fruit development in Jamun (*Syzygium cumini* Skeels). *South Indian Journal of Horticulture*. 1992;40:350-351
- Hemavathi GN, Patil SV, Swamy GSK, Raghunath Reddy RL, Tulsiram K, Sreenivas KN. Influence of Different Levels and Concentration of Micronutrients on Growth and Yield of Jamun (*Syzygium cumini* Skeels.). *International Journal of Current Microbiology and Applied Sciences*. 2019;8(1):2966-2972.
- Keskar BG, Karale AR, Dhawale BC, Chaudhary KG. Improvement of Jamun by selection. *Maharashtra Journal Horticulture*. 1989a;4:117-20.
- Mishra RS, Bajpai PN. Studies on pollination, fruit set and fruit development in Jamun (*Syzygium cumini* Skeels). *Progressive Horticulture*. 1984;16(1, 2):1-5
- Singh S, Singh SP, Singh V, Shikha K. Studies on floral biology, fruit set and fruit drop of different genotypes of jamun (*Syzygium cumini* Skeels). *The Pharma Innovation Journal*. 2019;8(1):558-561.
- Singh Sanjay, Singh AK. Studies on variability in Jamun (*Syzygium cumini* Skeels.) from Gujarat. *Asian Journal of Horticulture*. 2012;7(1):186-189.