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Dr. RS Verma
Department of Horticulture, School of Agricultural Sciences and Technology, Babasaheb Bhimrao Ambedkar University A Central University, Vidya Vihar, Rae Bareli Road, Lucknow, Uttar Pradesh, India

Rubee Lata
Department of Horticulture, School of Agricultural Sciences and Technology, Babasaheb Bhimrao Ambedkar University A Central University, Vidya Vihar, Rae Bareli Road, Lucknow, Uttar Pradesh, India

RB Ram
Department of Horticulture, School of Agricultural Sciences and Technology, Babasaheb Bhimrao Ambedkar University A Central University, Vidya Vihar, Rae Bareli Road, Lucknow, Uttar Pradesh, India

Som Prakash
Department of Horticulture, School of Agricultural Sciences and Technology, Babasaheb Bhimrao Ambedkar University A Central University, Vidya Vihar, Rae Bareli Road, Lucknow, Uttar Pradesh, India

Viplaw Kumar
Department of Horticulture, School of Agricultural Sciences and Technology, Babasaheb Bhimrao Ambedkar University A Central University, Vidya Vihar, Rae Bareli Road, Lucknow, Uttar Pradesh, India

SS Verma
Department of Agriculture, Barabanki, Uttar Pradesh, India

Harvinder Pal
Department of Horticulture, School of Agricultural Sciences and Technology, Babasaheb Bhimrao Ambedkar University A Central University, Vidya Vihar, Rae Bareli Road, Lucknow, Uttar Pradesh, India

Rajmani Singh
Department of Horticulture, School of Agricultural Sciences and Technology, Babasaheb Bhimrao Ambedkar University A Central University, Vidya Vihar, Rae Bareli Road, Lucknow, Uttar Pradesh, India

Correspondence
Dr. RS Verma
Department of Horticulture, Babasaheb Bhimrao Ambedkar University A Central University, Vidya Vihar, Rae Bareli Road, Lucknow, Uttar Pradesh, India

Evaluation of physico-chemical attributes of different genotypes of jamun (*Syzygium cumini* L. Skeels.) fruits

Dr. RS Verma, Rubee Lata, RB Ram, Som Prakash, Viplaw Kumar, SS Verma, Harvinder Pal and Rajmani Singh

Abstract
The present investigation was undertaken for Evaluation of physico-chemical attributes of different genotypes of jamun (*Syzygium cumini* L. Skeels.) fruits. The fruits of different genotypes were collected from Lucknow city and its adjacent areas (east, west, north and south)**.** The observations on various attributes recorded revealed that the maximum fruit length, fruit width, fruit weight, pulp weight, stone weight, pulp percent, volume (ml), TSS (3.45 cm, 2.32 cm, 9.62 g, 7.60 g, 2.61 g, 90.67, 4.66 and 25.5 respectively) jamun fruit and stone colour varied from bluish purple, dark purple, black, purple, reddish purple, reddish black and brownish white, whitish purple and white respectively. However, LJ-11 recorded maximum (90.67%) pulp recovery.

Keywords: Jamun, genotypes, physico–chemical, quality

Introduction
Jamun is an important indigenous fruit of India. It is widely grown in the larger parts of India from the Indo-Gangetic plains in the north to Tamil Nadu in south. It also occurs in the lower range of the Himalayas up to 1,300 m above mean sea-level. As its area of growing clearly indicates, it has wide diversity in fruit shape, size, colour taste, stone, percent of pulp ratio and acidity etc. which needs to be exploited. Jamun is an important underexploited indigenous fruit tree of India. It is a very common, large, evergreen beautiful tree of Indian sub-continent belongs to the Myrtaceae family. The tree is 8 m to 15 m tall, with oblong, opposite leaves that are smooth and glossy with a turpentine smell. The bark is scaly grey and the trunk is forks or multiple stem which has fragrant white flowers in branched clusters with hermaphrodite nature at stem tips and purplish-black oval edible berries with single seed.

Jamun possesses commercial importance as a minor fruit in tropical and subtropical conditions. It is a versatile fruit tree of best food and medicinal value. It is found throughout India starts from Myanmar and extended to Afghanistan. This plant is also found in other countries like Thailand, Philippines, Madagascar etc. World production of jamun is estimated as 13.5 million tonnes out of which 15.4% is contributed by India (Singh *et al*., 2011) [12]. India ranks second in production of jamun in the world. Maharashtra is the largest jamun producer followed by Uttar Pradesh, Tamil Nadu, Gujarat and Assam respectively.

Moreover, Jamun has a very long history of use for various medicinal purpose and currently has a large market for the treatment of diabetes, chronic diarrhoea and other enteric disorders, including its use as an antimicrobial (Migliato *et al.*, 2005) [8]. Jamun seeds and bark have been prescribed in ayurvedic medicine for the treatment of diabetes and are also used as anti-inflammatory, antipyretic, astringent and antidiarrheal agents (Ross). The seed is also used in various alternative healing systems like Ayurveda, Unani and Chinese medicines for digestive aliments (Achrekar *et al.*, 1991) [2]. Jamun has promising theraupeutic value due to its various phyto-constituents and pharmacological properties. It is a good source of iron apart from being the source of other minerals, sugars and phytochemicals (Singh *et al.*, 1967) [11]. The fruit is a rich source of anthocyanins, pectin, phenols and protein. Seed contains an alkaloid jambosin and a glycoside, antimallin, which reduces or stop diastatic conversion of starch into sugars. The volatile oil from the jamun seeds can be extracted and used as an effective medicine against diabetes, heart and liver troubles. The antioxidant activity of jamun fruit has been attributed to its total phenolic compounds including anthocyanins. Glucose and fructose are the principal sugars in the ripe fruits, with no trace of sucrose. In recent years, jamun fruits are becoming popular due to their rich medicinal properties particularly for the 2 antidiabetic properties. The medicinal value is due to the presence of malic acid, oxalic acid, gallic acid and tannins.

Jamun is a nutritious fruit tree with a variety of uses. The fully ripe fruits with acid spicy flavour are eaten as fresh and can be processed into a variety of products like jam, jelly, squash, wine, vinegar and pickles. Flowers rich in nectar, yield high quality honey. Jamun seed can be used as concentrate for animals because it is rich in protein, carbohydrates and calcium. Therefore, assessment of genetic diversity of different genotypes / germplasm / populations is important to form a basis for conservation, genetic tree improvement and promotion or domestication of populations with desirable traits.

Materials and Methods

The present investigation entitled "Evaluation of physico-chemical attributes of different genotypes of jamun (*Syzygium cumini* L. Skeels) fruits was carried out in the Department of Horticulture, School of Agricultural Sciences and Technology during the year 2019-20. All together there were twelve genotypes collected from different parts of Lucknow (east, west, north, south). The analytical work was done in the laboratory of Department of Horticulture, School of Agricultural Sciences and Technology, Babasaheb Bhimrao Ambedkar University, Lucknow (U.P.). The collection of fruits of different genotypes were done during the month of July (1st week to 3rd week of July) in 2019. The physico-chemical analysis was carried out as per method given by AOAC (1980) [1].

Table 1: Physico-chemical attributes of different genotypes of jamun (*Syzygium cumini* L. Skeels.) fruits

Genotypes	Fruit length (cm)	Fruit width (cm)	Fruit weight (g)	Pulp weight (g)	Stone weight (g)	Pulp (%)	Volume (ml)	TSS (0 brix)	Acidity (%)	Fruit colour	Seed colour
LJ-1	1.93	1.89	5.20	3.84	1.36	73.84	2.01	12.0	0.413	bluish purple	brownish white
LJ-2	2.80	1.98	7.41	4.81	2.60	64.91	3.04	12.4	0.408	dark purple	whitish purple
LJ-3	2.68	2.11	8.00	5.71	2.29	71.37	3.42	18.5	0.354	black	white
LJ-4	3.46	2.32	9.62	7.01	2.51	72.86	4.66	15.9	0.379	purple	white
LJ-5	2.69	2.17	6.44	3.94	2.50	61.18	2.05	17.6	0.368	dark purple	whitish purple
LJ-6	2.98	2.07	7.85	6.05	1.80	77.07	3.80	18.9	0.436	purple	white
LJ-7	2.91	2.03	8.60	7.60	1.00	88.37	4.10	21.4	0.322	reddish purple	white
LJ-8	2.75	2.18	8.21	6.30	1.91	76.70	3.60	19.5	0.306	purple	brownish white
LJ-9	1.86	1.72	5.48	3.48	2.00	63.50	2.13	16.4	0.372	bluish purple	white
LJ-10	2.01	1.71	7.07	4.90	2.17	69.30	2.90	18.1	0.353	reddish black	brownish white
LJ-11	1.75	1.49	4.61	4.15	0.43	90.67	1.30	25.5	0.301	black	white
LJ-12	2.13	1.97	8.97	6.82	2.15	76.03	3.88	20.0	0.319	reddish	whitish purple
SE(m)	0.116	0.052	0.048	0.045	0.056	5.624	0.057	0.597	0.024	-	-
C.D. at 5%	0.342	0.154	0.142	0.132	0.165	16.600	0.168	1.761	0.071	-	-

(LJ-1: Chiryabagh, LJ-2: Vrindavan, LJ-3: South city, LJ-4: Ishwari khera, LJ-5: Chowk, LJ-6: Rajajipuram, LJ-7: Kusli kheda, LJ-8: Palpur, LJ-9: Cantonment, LJ-10: Aashiana, LJ-11: Arjun Ganj, LJ-12: Eldeco Phase-II)

Results and Discussion

Perusal of data on various physico-chemical parameters presented in Table -1 reveals that there was a significant variation in different genotypes. Observations recorded on fruit length (cm), fruit width (cm), fruit weight (g), pulp weight (g), stone weight (g), pulp (%), fruit colour, seed colour, volume (ml) and chemical character TSS and acidity. The maximum fruit length recorded under the genotype LJ-4 (3.45 cm) followed by LJ-5 (3.02 cm). The minimum fruit length was recorded in genotype LJ-11 (1.75 cm). The maximum fruit width was recorded under the genotype LJ-4 (2.32 cm) followed by LJ-8 (2.18 cm). Whereas, the minimum fruit width was recorded in genotype LJ- 11 (1.49 cm). Prakash *et al.* (2010) [9] and Patel *et al.* (2005) observed the similar variations in length and width of the jamun fruit. The maximum fruit weight was recorded genotype LJ-4 (9.62 g) followed by LJ-12 (8.97 g). The minimum fruit weight was recorded in genotype LJ-11 (4.61 g). Similarly, Ghojage *et al*. (2009) [5] reported the fruit weight varied from 5.27 g in LJS-24 to 13.45 g in LJS- 4. Variations in fruit weight were also supported by Devi *et al*. (2002) [4]; Inamdar *et al*. (2002). The maximum pulp weight was recorded under the genotype LJ-7 (7.60 g) followed by LJ-4 (7.01 g). The minimum pulp weight was recorded under genotype LJ-9 (3.48 g). The maximum stone weight was recorded in genotype LJ-4 (2.61 g) followed by LJ-2 (2.60 g). The minimum stone weight was recorded in genotype LJ-11 (0.43 g). The maximum pulp percent was recorded in genotype LJ-11 (90.67) having smaller fruit size followed by LJ-7 (88.73) with medium size fruit. The minimum pulp percent was recorded in genotype LJ-5 (61.18). These results are in conformity with findings of Garande *et al*. (1998) [6, 7]; Singh and Singh (2012) in jamun. The maximum volume under recorded genotype LJ-4 (4.66 ml) followed by LJ-7 (4.10 ml). The minimum volume was recorded genotype LJ-11 (1.30 ml). These results supported the findings of Ghojage *et al*. (2009) [5]. The maximum TSS was recorded in genotype LJ-11 (25.5^0 Brix) followed by LJ-7 (21.4^0 Brix). The minimum TSS was recorded in genotype LJ-1 (12.0 ^{0}Brix). This result corroborates the finding of Bal (2006) [3]. The minimum acidity recorded under the genotype LJ-11 (0.301) followed by LJ-12 (0.319). The maximum acidity was found under genotype LJ-1 (0.413). This result is in consonance with the report of Srivastava *et al*. (2010) [13] who reported maximum acidity in VJ-20 (1.14%) whereas, minimum was in genotype VJ-5 (0.37%). The colour of jamun fruit varied from bluish purple, dark purple, black, Purple, dark purple, reddish purple, reddish black. The colour of jamun seeds were recorded under the genotype brownish white, whitish purple and white respectively.

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