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Studies on variability in fruit characters of jamun (*Syzygium cumini* Skeels) genotypes

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Abstract

The present research entitled studies on variability in fruit characters of jamun (*Syzygium cumini* Skeels) genotypes was carried out in Northern Bastar Plateau Region of Chhattisgarh during the year 2016-17 and 2017-18 to select some promising genotypes of jamun. A very good jamun collection of variability has confined in Northern Bastar Plateau Region of Chhattisgarh. A wide range of variability was observed in the fruit composition of fruit among the investigated genotypes. The CGJAM-20 genotypes were observed most promising in terms of fruit weight, pulp weight and seed weight and CGJAM-24 with respect to fruit length and seed length. Therefore, these genotypes are suitable for further perpetuation for commercial and systematic orcharding of jamun.

Keywords: Variability, fruit, jamun, genotypes

Introduction

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 up to an altitude of 1800 m and its habitat 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). 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. Jamun (*Syzygium cumini* Skeels or *Eugenia jambolana*) 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. Jamun has promising therapeutic 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). The fruit is a rich source of anthocyanins, pectin, phenols and protein. Seed contains an alkaloid jambosin and a glycoside, jambolin or 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 subacid spicy flavour are eaten as fresh and can be processed into a variety of products like jam, jelly, squash, wine, vinegar and pickles. The foliage serves as fodder for cattle, twigs form good datoon and as rough painting brush. The timber is used for buildings, agricultural implements and railway sleepers. The jamun fruit demand is increasing day by day because of its nutritive value and that will require selected plants of superior quality with high yield potential. As majority of jamun trees are of seedling origin, they show tremendous variation in their morphology and physicochemical attributes. Lack of improved high yielding varieties with dwarf stature and good keeping quality are the major bottlenecks for the commercial cultivation of jamun in India. Considering the above facts, the present study entitled "Variability in quantitative characters of jamun (*Syzygium cumini* Skeels) genotypes" was undertaken with the objective to evaluate the quantitative

characters of jamun genotypes for identifying the superior types.

Material and Methods

This study was carried out at the Northern Bastar Plateau Region of Chhattisgarh and the collected genotypes were analyzed in the quality laboratory of the Department of Horticulture, College of Horticulture and Research Station, Kanker, IGKV, Raipur, Chhattisgarh during February to July of 2016-17 and 2017-18. Sixty promising genotypes of 8 to 15 year jamun tree were collected. The experiment was designed with three replication and each four branches from the tree was considered as one replicate. The treatments were arranged according to randomized complete block design (RCBD). Fruits at full maturity were harvested and physical characters viz., fruit length, fruit width, seed length, seed width, seed weight, fruit weight, pulp weight, pulp/seed, fruit/seed were determined by following standard procedures.

Results and Discussions

The data pertaining to fruit characters of jamun genotypes showed significant difference and a high degree of variability for all the characters studied (Table 1).

Maximum length of fruit (4.366 cm) was recorded in genotype CGJAM-24 and minimum was 1.711 cm in CGJAM-23. Maximum width of fruit (3.956 cm) was recorded in genotype CGJAM-39 and minimum was 1.191 cm in CGJAM-54. Maximum length of seed (3.832 cm) was recorded in genotype CGJAM-18 and minimum was 0.999 cm in CGJAM-9. Maximum length of seed (2.939 cm) was recorded in genotype CGJAM-24 and minimum was 0.828 cm in CGJAM-9. Maximum volume of fruit (24.390 cc) was recorded in genotype CGJAM-3 and minimum was 1.805 cc in CGJAM-43. Maximum volume of seed (4.345 cc) was recorded in genotype CGJAM-13 and minimum was 0.532 cc

in CGJAM-9. Maximum weight of fruit (16.575 g) was recorded in genotype CGJAM-20 and minimum was 1.890 g in CGJAM-23. Maximum weight of pulp (12.828 g) was recorded in genotype CGJAM-20 and minimum was 0.868 g in CGJAM-37. Maximum weight of seed (3.90 g) was recorded in genotype CGJAM-20 and minimum was 0.740 g in CGJAM-23. Maximum fruit/ seed (16.713) were recorded in genotype CGJAM-38 and minimum was 1.787 in CGJAM-47. Maximum Pulp/ seed (10.087) were recorded in genotype CGJAM-38 and minimum was 0.860 in CGJAM-47

In the results it is clearly indicated the presence of variability in the genetic constitution of the jamun genotypes. Similar variation in the studied for different jamun genotypes were also reported by several workers such as by Prakash *et al.* (2010)^[1], Srivastava *et al.* (2010)^[2], Singh and Singh (2012)^[3], Singh *et al.*, 2016^[4], Swamy *et al.* (2017)^[5]. The physico-chemical characteristics of fruit predict the stability and the suitability of a variety of fruit crop and not the yield. Many workers have extent the importance of these characters in different fruit crops like jamun (Daware, 1981; Sanjeevkumar and Singh, 1993; Inamdar *et al.*, 2002; Prabhuraj, 2002b; Laxmikanth, 2004; Patel *et al.*, 2005; Bhardwaj and Yamdagni, 2005 and Singh *et al.*, 2007)^[6, 7, 8, 9, 10, 11, 12, 13] and Karale *et al.*, 1989 in Karonda. In the present investigation too, similar characters were studied and a wide variation in these traits were observed. It is relevant to record that a genotype with maximum value in a particular component had not expressed the similar result with respect to growth and physico-chemical characters. This showed that each and individual genotype is a source for one trait at present level. That means to reveal that these characters are diverging across the genotypes under investigation and hence there is a tremendous scope in associating the desirable traits through consciously outline for the development of new variations.

Table 1: Characterization of jamun genotypes on basis of pooled data analysis

Treatments	Fruit length (cm)	Fruit width (cm)	Seed length (cm)	Seed width (cm)	Fruit volume (cc)	Seed volume (cc)	Fruit weight (g)	Pulp weight (g)	Seed weight (g)	Fruit/Seed	Pulp/Seed
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
CGJAM- 1	2.789	2.845	2.361	2.059	3.728	1.473	3.612	2.435	1.473	2.702	1.672
CGJAM- 2	3.270	2.995	1.905	1.062	8.808	2.130	8.900	8.093	2.092	4.676	3.967
CGJAM- 3	3.606	3.236	2.074	1.239	24.398	2.203	10.885	8.693	2.840	4.225	3.168
CGJAM- 4	2.921	2.627	1.492	1.083	2.798	1.755	3.942	2.657	1.632	2.655	1.680
CGJAM- 5	3.268	3.018	2.697	2.152	6.488	1.725	7.768	5.982	1.843	4.690	3.362
CGJAM- 6	4.111	3.335	3.203	2.186	10.253	2.670	12.065	8.587	2.840	4.587	3.135
CGJAM- 7	2.805	2.534	1.425	0.950	3.205	1.838	3.727	2.060	1.545	2.928	1.493
CGJAM- 8	3.589	2.902	1.976	1.061	18.620	1.840	7.757	5.032	2.182	3.917	2.397
CGJAM- 9	2.399	2.110	0.999	0.828	2.253	0.532	2.463	1.492	0.842	3.268	1.853
CGJAM- 10	3.413	2.892	1.895	1.239	17.452	2.107	7.765	5.935	2.333	3.387	2.897
CGJAM- 11	4.201	3.336	2.262	1.246	23.150	2.268	15.307	10.833	2.873	5.743	3.935
CGJAM- 12	2.828	2.334	1.483	1.026	3.170	1.663	3.992	2.187	1.777	2.418	1.283
CGJAM- 13	3.592	3.037	1.711	1.139	17.130	4.345	10.130	8.148	1.822	6.008	4.668
CGJAM- 14	3.565	2.988	1.600	1.145	9.080	1.657	7.465	6.772	1.503	5.373	4.703
CGJAM- 15	3.546	2.578	3.722	2.655	6.370	1.740	9.390	6.990	2.607	3.855	2.782
CGJAM- 16	2.930	2.199	3.247	2.557	3.893	1.307	5.230	3.478	1.560	3.585	2.318
CGJAM- 17	4.108	3.902	3.324	2.771	8.540	2.223	8.442	6.030	2.632	3.497	2.353
CGJAM- 18	3.905	3.365	3.832	2.654	11.547	1.670	9.653	7.310	2.467	3.883	2.962
CGJAM- 19	3.844	3.412	3.161	2.181	11.718	2.378	11.453	9.040	2.590	4.060	3.690
CGJAM- 20	4.217	3.754	3.262	2.353	17.173	2.163	16.575	12.828	3.940	4.608	3.290
CGJAM- 21	2.967	2.441	2.379	1.777	3.593	0.538	3.117	2.397	0.760	4.478	3.258
CGJAM- 22	3.495	2.830	1.862	1.078	11.848	1.770	7.360	4.818	2.352	3.290	2.098
CGJAM- 23	1.711	1.191	2.653	2.495	1.948	0.500	1.890	1.142	0.740	2.812	1.603
CGJAM- 24	4.366	3.848	3.705	2.939	8.958	6.155	10.862	6.832	3.642	3.120	1.888
CGJAM- 25	4.089	3.420	3.645	2.700	6.035	2.405	10.282	7.425	2.416	4.247	3.137

CGJAM- 26	3.512	3.074	1.956	1.223	14.993	1.833	8.748	5.775	2.453	3.680	2.372
CGJAM- 27	3.377	3.147	1.899	1.164	9.032	2.130	8.567	5.383	2.615	3.410	2.077
CGJAM- 28	3.100	2.784	1.555	1.032	7.443	1.713	5.008	3.442	1.383	3.640	2.532
CGJAM- 29	3.207	2.834	1.672	1.049	6.467	2.097	5.082	2.572	1.823	2.983	1.490
CGJAM- 30	3.294	2.868	3.231	2.682	4.787	1.248	5.490	3.973	1.663	3.488	2.492
CGJAM- 31	4.031	3.228	3.616	2.703	5.120	1.470	9.673	6.687	2.557	4.017	2.735
CGJAM- 32	4.426	3.856	3.751	2.705	10.338	2.307	10.553	6.840	2.557	3.940	2.725
Treatments	Fruit length (cm)	Fruit width (cm)	Seed length (cm)	Seed width (cm)	Fruit volume (cc)	Seed volume (cc)	Fruit weight (g)	Pulp weight (g)	Seed weight (g)	Fruit/Seed	Pulp/Seed
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
CGJAM- 33	4.080	3.898	3.504	2.856	10.863	1.537	12.092	7.022	3.818	3.518	1.923
CGJAM- 34	2.763	2.504	2.537	2.403	3.392	2.452	2.375	1.168	0.787	3.315	1.532
CGJAM- 35	3.081	2.900	2.891	2.271	5.702	1.417	4.762	3.692	1.172	4.477	3.225
CGJAM- 36	3.244	3.060	2.709	2.328	2.600	1.160	11.150	8.010	0.888	13.823	9.158
CGJAM- 37	2.626	2.415	2.703	2.579	1.912	1.487	2.158	0.868	1.010	2.345	0.885
CGJAM- 38	2.658	2.462	2.592	2.444	2.342	1.410	11.280	7.393	0.745	16.713	10.087
CGJAM- 39	4.207	3.956	3.578	2.686	9.187	1.685	10.132	7.180	2.307	4.915	3.288
CGJAM- 40	3.129	2.354	3.755	2.708	11.093	2.367	11.225	7.793	3.192	3.882	2.525
CGJAM- 41	3.398	2.932	3.498	2.633	7.163	1.978	10.660	7.950	2.542	4.635	3.237
CGJAM- 42	4.014	3.344	3.52	2.544	5.767	1.943	5.978	3.785	2.348	2.808	1.652
CGJAM- 43	3.246	2.957	2.774	2.495	1.805	0.645	1.937	1.072	0.918	2.340	1.215
CGJAM- 44	3.690	3.246	2.764	2.072	8.589	1.420	8.863	6.670	2.305	4.213	2.990
CGJAM- 45	3.610	3.015	3.060	2.239	7.378	2.372	8.651	6.450	2.585	3.730	2.598
CGJAM- 46	2.338	2.188	0.998	0.924	1.447	0.570	1.977	1.032	0.863	2.662	1.280
CGJAM- 47	2.587	2.700	2.317	2.062	2.482	1.878	2.580	1.329	1.592	1.787	0.860
CGJAM- 48	2.672	2.232	1.896	1.042	7.988	3.010	8.395	5.690	2.605	3.550	2.253
CGJAM- 49	2.835	2.498	1.471	1.102	3.342	2.680	10.050	7.407	2.662	4.163	2.873
CGJAM- 50	2.912	2.432	2.543	1.828	8.937	2.932	10.205	7.092	2.700	4.162	2.712
CGJAM- 51	2.570	2.083	2.582	2.164	11.183	2.630	6.787	4.198	2.443	3.077	1.778
CGJAM- 52	2.823	2.498	2.670	1.838	9.882	2.323	10.075	7.152	2.170	5.123	3.407
CGJAM- 53	2.788	2.325	1.949	1.125	8.595	2.058	9.458	7.383	2.152	4.895	3.467
CGJAM- 54	1.813	1.729	1.951	1.283	9.758	1.587	3.467	1.603	1.617	2.293	1.027
CGJAM- 55	2.836	2.332	1.746	1.206	10.922	2.385	10.367	6.293	2.813	3.945	2.322
CGJAM- 56	2.964	2.450	1.890	1.204	6.970	1.833	11.065	7.930	2.948	4.025	2.798
CGJAM- 57	3.242	2.356	1.741	1.075	9.995	2.947	10.262	6.948	3.065	3.617	2.367
CGJAM- 58	3.720	3.337	3.630	2.823	8.107	1.735	10.708	7.452	3.072	3.738	2.570
CGJAM- 59	3.958	3.680	3.438	2.782	4.548	1.958	8.032	5.445	3.177	2.777	1.767
CGJAM- 60	2.784	2.344	3.489	2.551	8.200	2.627	8.765	6.770	2.663	3.607	2.588
General Mean	3.284	2.852	2.562	1.906	8.174	1.981	7.943	5.577	2.158	4.121	2.739

References

- Prakash J, Maurya AN, Singh SP. Studies on variability in fruit characters of jamun. Indian J Hort. 2010; 67:63-66.
- Srivastava V, Rai PN, Kumar P. Studies on variability in physicochemical characters of different accession of Jamun (*Syzygium cumini* Skeels). Pantnagar J Res. 2010; 8(1):139-142.
- Singh S, Singh AK. Studies on variability in Jamun (*Syzygium cumini* Skeels) from Gujarat. Asian J Hort. 2012; 7(1):186-189.
- Singh SY, Shirai VD, Swamy GSK. Genetic variation for morphological and physicochemical traits in jamun (*Syzygium cumini* Skeels). Asian J Hort. 2016; 11(1):163-167.
- Swamy GSK, Anushma PL, Jagadeesha RC. Morphological characterization of elite Jamun (*Syzygium cumini* Skeels) genotypes. Int. J. Minor Fruits. Medicinal and Aromatic Plants. 2017; 3(1):09-15.
- Daware SG. Survey for selection of superior jamun (*Syzygium jambolanum*) and ber (*Zizyphus mauritiana*) strains in the Marathwada region. M.Sc. (Agri.) Thesis, MKV, Parbhani, 1981.
- Sanjeev Kumar, Singh IS. Variation in quality traits of jamun germplasm. South Indian Hort. 1993; 36(2):108-110.
- Inamdar S, Swamy GSK, Patil PB, Athani SI. Correlation and path analysis studies in jamun for fruit characters. J Maharashtra Agric. Univ. 2002; 27:212-213.
- Prabhuraj HS. Correlation and path coefficient analysis in jamun (*Syzygium cumini*) trees. My Forest. 2002(b); 38(2):177-182.
- Laxmikanth. Investigation of elite jamun (*Syzygium cumini*) selects. M.Sc. (Hort) thesis, Univ. of Agril. Sci., Dharwad, 2004.
- Patel VB, Pandey SN, Singh SK, Das B. Studies on variability in Jamun (*Syzygium cumini* Skeels) accessions from Uttar Pradesh and Jharkhand. Indian J Hort. 2005; 62(3):244-24.
- Bharadwaj R, Yamdagni R. Physico-chemical characteristics of jamun (*Syzygium cumini*). Haryana J Hort. Sci. 2005; 34(1-2):54-55.
- Singh AK, Bajpai A, Singh A, Reddy BMC. Evaluation of variability in jamun using morphological and physico-chemical characterization. Indian J Agril. Sci. 2007; 77(12):845-848.
- Karale AR. Woodapple. (In) Fruits: Tropical and Subtropical. Vol. II (eds: T.K. Bose, S.K. Mitra and D.Sanyal). Nayan Udyog, Calcutta, 2002, 731-736.