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### A new Jamun (*Syzygium cumini* L.) variety- Chintamani selection 1

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#### Abstract

Jamun is a hardy fruit crop, it can be grown under adverse soil and climatic conditions. It thrives well under both tropical and subtropical climates. The medicinal value of this fruit is getting recognised as it has high nutritious and therapeutic value. In this regard an attempt has been carried out in order to bring out good variety through clonal selection among available germplasm resources in the locality. The elite clones selected from farmers plot and clones collected from farmer's field at Maravapalli village of Chintamani taluk were evaluated and selection was carried out along with local check Srinivaspur selection. Evaluation was carried out at Agricultural Research Station, Chintamani and in farmers field which comes under zone V of Karnataka. The characteristic features observed from the clonal selections viz., big sized fruits having higher pulp content and Total Soluble Sugars (TSS) were considered for selection. Among the clones evaluated, Chintamani selection-1 had regular bearing of fruits with average yield of 150kg/tree. The grafts started bearing from 4 years after planting. Comparative results of Chintamani selection-1 with check Srinivaspur selection was better in terms of morphology of fruit, fruit yield and other physicochemical characters.

**Keywords:** Jamun, clonal selection, chintamani selection 1, fruit yield

#### Introduction

*Syzygium cumini* (L.) belongs to family *Myrtaceae* and popularly known as Jambu nerale in Kannada. A large evergreen tree growing up to 30m tall with pale brown or greyish bark with smooth, exfoliating into woody scales, Leaves are opposite, ovate or elliptic lance shaped, narrowed at base, with numerous, fine, parallel lateral nerves, pinkish when young, changing to a leathery, glossy dark green with a yellow midrib as they mature and are with aroma similar to turpentine. Flowers are greenish white, small with sweet scented, placed in axillary or terminal panicles. Fruits are ellipsoid or egg-shaped, smooth, dark purplish-black when ripen, pulp is juicy pinkish and is combination of sweet, mildly sour and astringent flavour and tends to colour the tongue purple. Fruit change its colour from green to deep red or bluish black. Fruits ripen during June-July or with onset of rains and takes 3-5 months to ripen after full bloom. The average yield of fully grown budded and seedling tree is about 50-70kg and 80-100kg/plant/year respectively. The Jamun trees can be grown on a wide range of soils viz., calcareous, saline, sodic soils and marshy areas. However deep loam and well drained soils are ideal and it does not prefer heavy and light sandy soils.

Botanically jamun species has basic chromosome number ( $x=11$ ) of eleven. In the *Myrtaceae*, diploid ( $2n=22$ ) is the most common ploidy level but polyploidy has been documented, However, recently Jena *et al.* (2003) recorded a somatic chromosome number of 66 in *Syzygium cumini* ( $2n=66$ ). The *Syzygium* species can be distinguished on the basis of fruit size and colour, leaf and flower characteristics (Hyland, 1983) [5]. *S. cumini* is the most famous among the species producing edible fruits and it is very often cultivated. Crop Improvement and Varietal Wealth Botanical studies have shown that in the Indian subcontinent there are two main morphotypes of Jamun and this is based on the morphological and organoleptic features, the Kaatha jamun which are small and acidic to taste, and the Ras Jamun, that are oblong, dark-purple or bluish, with pink, sweet fleshy pulp and small seeds (Jabbar *et al.*, 1994; Morton, 1987) [6, 8]. Most common type grown in North India is known as Rasjamun (large, Oblong, deep purple colour fruit). Another type in Varanasi without seed (Narendra Jamun). Highly heterozygous nature and cross pollination make it difficult to predict the characteristics

of the hybrid. The long juvenile period of jamun trees, from seed until maturity and from one generation to the next generation has resulted in less breeding work and no prominent varieties released in southern Karnataka. But its medicinal value is getting recognised as it has high nutritious and therapeutic value (Chevallier, 1996) [2]. In this regard an attempt has been carried out in order to bring out high yielding clone through clonal selection among available germplasm resources in the region.

### Materials Method

The methodology and materials adopted for this study are Clonal selection, the clones were obtained from farmers plot. Mother tree available in farmer's field at Maravapalli village of Chintamani Taluk were evaluated and clonal selection was made along with local check Srinivaspur selection. Evaluation was carried out in Agricultural Research Station, Chintamani and in farmers' fields which southern Karnataka during 2010-11 to 2016-17.

The spacing given for the jamun plants in the field includes 10m X 10m, spacing and a total of 100 plant were planted in the plot. Recommended package of practice was followed. Clones were planted during 2005 and observations were recorded based on average yield of five clones per tree during every year starting from 2010-11 to 2016-17. Observations

pertaining to yield attributing traits were recorded viz., fruit length (cm), fruit width (cm), fruit weight (g), pulp weight (g), seed weight (g), and pulp recovery (%). Physicochemical properties of jamun were also recorded viz., Total Soluble Sugars (TSS-Brix value) and acidity percentage in addition, other morphological characters observed were also recorded viz., colour of the pulp, fruit shape, bearing habit and tree type.

### Results and Discussion

The characteristic features observed from the clonal selected varieties were, big sized fruits having higher pulp content and higher Total Soluble Sugar (TSS). Among the clones evaluated Chintamani Selection 1 had regular bearing of fruits with an average yield of 150kg/tree. The grafts started bearing from 4 years after planting. Comparative results of Chintamani Selection 1 with check Srinivaspur selection are given in tables for morphology of fruit, fruit yield and physicochemical characters.

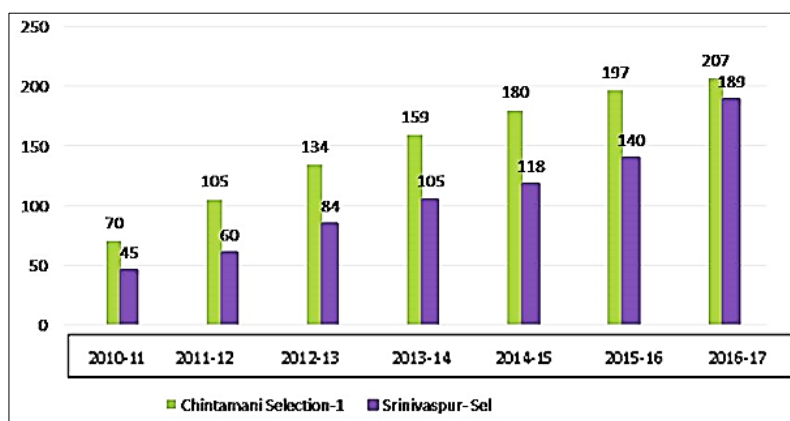
**Fruit yield:** The Jamun trees was planted in the year 2005 in the field and after a period of 6 years an average yield of 5 clones/tree was recorded. Year wise comparative performances of selected clones and check in term of fruit yield (kg /tree) is given in table 1.

**Table 1:** Comparative performances of selected clone and check for fruit yield

Clone	2010-11	11-12	12-13	13-14	14-15	15-16	16-17	Cumulative yield (kg/tree)	Mean yield (kg/tree)
	1 <sup>st</sup> Year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> year	5 <sup>th</sup> year	6 <sup>th</sup> year	7 <sup>th</sup> year		
Chintamani Selection-1	70	105	134	159	180	197	207	1052	150.3
Srinivaspur-Sel (Check)	45	60	84	105	118	140	189	741	105.6

The evaluation of performance of the clones were carried out from 2010-11 to 2016-17, the data showed an increasing trend in the yield of jamun with reference to age was very evident (Fig. 1). Chintamani Selection 1 performed better in terms of average yield. From the above table 1 it is inferred; that there was 42% increase in fruit yield in chintamani selection 1 over check. Srinivaspur Selection. The performance of the elite Jamun clone Chintamani Selection 1 in terms of mean fruit yield of seven years was 150.3kg/tree whereas Srinivaspur

Selection recorded 105.6kg/tree. Simultaneously, the Jamun Clone Chintamani Selection 1 was also evaluated in farmer's field during 2015-16 and 2016-17 in Maravapalli, Chilakalanerpu and Hadigere villages of Chintamani taluk. The clone showed good performance with respect to fruit yield from 186-205kg/tree. During 2015-16, the performance of elite jamun clone Chintamani Selection 1 in farmer fields of Maravapalli, Chilakalanerpu and Hadigere varied with respect to yield per tree are depicted in given in table 2.



**Fig 1:** Graph showing trend of yield of Chintamani and Srinivaspur selection (check) with respect to age of the trees

**Table 2:** Performance of elite Jamun clone CS-1 in the farmer's field (kg/tree)

Year	Maravapalli	Chilakalanerpu	Hadigere
2015	205	186	203
2016	225	215	186
Mean	215	201	195
Average fruit yield 204 kg/tree			

### Physicochemical properties and other qualitative characteristics:

Total Soluble Sugars (TSS) are estimated in terms of degree brix. One degree of Brix is 1 g of sucrose in 100 grams of solution. It represents the strength of the solution as percentage by mass. In the present study, total soluble sugar is 15.0 for Chintamani Selection-1 and acidity of 0.25% was recorded when compared to Srinivaspur

Selection (check) which had lesser brix value of 12.0 and acidity % 0.26 (Table 3). Similar observation was also reported by Roy *et al.* (1999) and Devi *et al.* (2002) [10] in jamun with respect to TSS indicating wide variation in Total soluble sugars. Studies conducted by Vijay *et al.*, 2017 [15] also reported high variability among all the accessions of jamun for TSS and Acidity.

**Table 3:** Comparison of Physico-chemical parameters of clones

Clone /Selection	Total soluble sugars (Brix)	Acidity %
Chintamani Selection-1	15.0	0.25
Srinivaspur Sel (check)	12.0	0.26

Fruit qualitative characters (Table 4) of Elite Jamun clone Chintamani Selection 1 and Srinivaspur Selection (check) were recorded. CS-1 had with fruit length of 3.6 cm, fruit width of 2.1 cm, Fruit weight of 17.9g, pulp weight of 16.0g, seed weight of 1.9g and pulp recovery of about 88.9%. Srinivaspur Selection (check) recorded lesser values for all these traits except for seed weight, which may be the reason for its lower pulp recovery which was only 67.50%. The pulp to stone ratio is an important aspect for selection of superior

**Table 4:** Comparison of Yield attributing characters of elite Jamun clone CS-1 and check

Clone/Selection	Fruit length (cm)	Fruit width (cm)	Fruit weight (g)	Pulp weight (g)	Seed weight (g)	Pulp recovery (%)
Chintamani Selection-1	3.6	2.1	17.9	16.0	1.9	88.9
Srinivaspur Sel (check)	3.2	1.4	15.0	13.5	2.0	67.50

Visual characters of the fruit and tree types indicated that Chintamani selection 1 was better with deep purple pulp and oblong fruit shape compared to black pulp and round fruit shape of srinivaspur selection 1. According to Shahnawaz and sheik (2011) for elliptical jamun fruit yields good juice content of 32%. In case of bearing habit and tree type both had regular bearing and umbrella tree type.

**Table 6:** Comparison of visual Characteristics of elite Jamun clone CS-1 and check.

Sl. No.	Characteristics	Chintamani selection-1	Srinivaspur Sel. (Check)
1	Colour of the pulp	Deep purple	Black
2	Fruit shape	Oblong	Round
3	Bearing habit	Regular	Regular
4	Tree type	Umbrella	Umbrella

From the present study, it is concluded that, a degree of variation observed among the genotypes with respect to yield and physico chemical parameters studied. However, the elite clone chintamani selection 1 has performed consistently with regular fruit bearing habit, good fruit weight and umbrella tree type canopy combined with good yield attributing characters compared to check Srinivaspur selection. Hence elite clone chintamani selection 1 has been recommended for the Southern region of Karnataka based on its performance and regular bearing habit.

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genotype by the breeder. Similar results were also reported by (Garanade *et al.* 1998) [8], this also indicated that higher fruit in Chintamani Selection 1 in comparison to Srinivaspur sel (check 15g) was because of higher pulp and not the seed weight. Similar variation in pulp weight was also reported by Athani *et al.*, 2006 [1]. Regarding fruit weight many studies have reported varying values of fruit weight ranging from 2 to 17gms. In this regard chintamani selection-1 is at higher side which makes it a good yielder. Prabhuraj (2002) [9] during the survey of jamun in Gokak taluk of Belgaum district reported an average fruit weight of 9.14g among the collections studied and it ranged from 14.67g to 3.73g. Singh *et al.* (2007) [13] conducted a survey on jamun in central Uttar Pradesh and reported that the maximum fruit weight of 17.60g. Srivastava *et al.*, 2012, studied the physicochemical characteristics of fruits from 25 genotypes of jamun (*S. cumini*) grown in Varanasi, Uttar Pradesh and Pantnagar, Uttarakhand and reported that fruit weight ranged from 2.24 to 7.05g. Ghojage *et al.*, (2011) [4] reported that the fruit weight ranged between 13.45 g in genotype to 5.27g among the 30 selected jamun genotypes in Gokak taluk.

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