Original Research Article

Study of Jamun (*Syzygium cumini* Skeels.) Genotypes Based on Shelf life and Interspecific Crossability

ABSTRACT

An experiment was conducted during 2019 to study the jamun genotypes based on shelf life of fruit. Shelf life studies were conducted on eight jamun genotypes and results indicated that, the maximum shelf life of the Jamun fruit was 5 days under normal room temperature after harvest at ripened stage. Genotypes Dhoopdal, Selection-45 and Savadatti had better shelf life compare to other genotypes. In crossing, out of 100 crossed flowers, only 5 crossed flowers were set and produced fully mature fruits.

Key words: Jamun genotypes, Shelf life, Inter specific crossing

Introduction

Jamun botanically called Syzygium cumini Skeels, belongs to the family myrtaceae (Sharma *et al*., 2012). Jamun is a multipurpose tree of both food and medicinal values. Fruits are used for table purpose and for the preparation of different variety of products (Juice, Squash, Jam etc.). Tree grows tall and is evergreen, long lived and also has got ornamental value; Inflorescences are borne in leaf axils of branch lets (panicles). Flowers are bisexual and light yellow in colour. Jamun is a cross pollinated tree. Fruits are oblong and round in shape, deep purple or bluish, juicy with sweet pulp with single seed. The most common type is Rajamun, which had large sized, oblong shaped fruits of deep purple colour with juicy sweet pulp. All parts of the tree such as fruits, leaves, seeds, and bark are used in Indian medicine system like Ayurveda, Homeopathy, Sidda and Unani (AYUSH) *etc*. Different parts of the jamun were also reported for antioxidant, anti-inflammatory, anti-microbial, anti-diarrheal, gastro protective and anti-ulcerogenic properties. Before the discovery of insulin, in the treatment of diabetes S. cumini was used either alone or in combination with other hypoglycemic plants even in Europe (Helmstadter, *et al*., 2008).

The fruits of jamun can be harvested after fully mature and ripen stage, but the harvesting is difficult due to large tree size. The fruits get damaged easily while harvesting which also weakens the storability. Jamun (*S. cumini*) has very low shelf life, whereas rose apple (S. jambose) has good keeping quality. It also produces fruits twice a year whereas jamun produces fruits only once in a year. Keeping these positive characters in view interspecific crossing is done in between these *Syzygium species*. So, crop improvement work in jamun is through selection of seedling trees based on high shelf life and other promising traits is needed. The study was continued with the help of fallowing objectives: to study fruit quality based on shelf life in jamun collections and to assess crossability among the *Syzygium jambos* with *S. cuminii*.

Material and Methods

The experiment entitled “Study of Jamun (*Syzygium cumini* Skeels.) Genotypes Based on Shelf life and Interspecific Crossability” was conducted at the experimental plot of division

of fruit crops at ICAR-Indian Institute of Horticultural Research, Bengaluru, during June 2019. The accessions for the study were selected from jamun germplasm block of ICAR-IIHR. The study on number of days, the fruit remained good marketable and fit for consumption under room temperature was recorded. For this, **e**ight genotypes were used for shelf life analysis of fruits. To study crossability percentage of *Syzygium sp*. especially rose apple with jamun pollen, 100 selected fully mature flowers were tagged, bagged and hand pollinated with jamun pollen in morning 10am – 12pm. Emasculated and bagged stigma of opening flowers were dusted with pollen of jamun genotype that is Huruli chikkanahalli. Selectively 100 Rose apple flowers were pollinated a day before flower opening and bagged. After 20-25 days fruit set was recorded and percentage of fruit set was calculated.

Results and Discussion

The results of the study pertaining to the Study of Jamun (*Syzygium cumini* Skeels.) Genotypes on Shelf life and Interspecific Crossing were presented in Table 1. Although jamun fruits have got high neutraucitical properties, the fruits have maximum shelf life of only 5 days at room temperature. Fruits stored under normal temperature condition weight of the fruits were decreasing day to day (Table 1). The genotypes Dhoopdal sel-20 (10.01 g), Selection-45 (10.08 g) and Savadatti (11.00 g) has maintained highest fruit weight in fifth day of storage, compare to other genotypes. It may be due to loss of water in storage. A similar result was reported by Dalvadi *et al.,* (2017) in jamun significantly reduced physiological loss in weight under room storage. TSS of the stored fruits was increasing from first day to fifth day in almost all genotypes, especially in Dhoopdal sel-20 (22.2 °B) and AJG-85 (25.2 °B) were showing drastic increase (Table 1). It may be due to respiration process of the fruit under storage, utilisation stored carbohydrates convertion into sugars. Acidity of the stored fruits was decreasing towards ripening up to three days and increasing of acidity was observed towards senescence stage in Selection-45 (1.34%) and Savadatti (1.00%).

The data of crossability was presented in Table 2. Hybridization/Crossing is done in between *Syzygium jambos* × *Syzygium cumini* to see the fruit set percentage in different species of same genus of *Syzygium*. The Rose apple was flowering twice in a year (October and March) and Jamun flowering in FebMarch, hence the crossing is done in during March and by using Emasculation and Hand pollination method. Crossing is done in 100 emasculated flowers, fruit set will occur 2-3 weeks after pollination. And the fruits will mature within 50-60 days. Out of 100 crossed flowers, 5 flowers set to matured ripened (golden yellow coloured) fruits (Table 2). Inter specific crosses between *Syzygium jambos* and *S. cumini* was attempted in 100 emasculated flowers, of fruit set observed 2-3 weeks after pollination. And the fruits matured within 50-60 days. Out of 100 crossed flowers, only 5 flowers matured ripened (golden yellow coloured) fruits. This may be due to low cross compatibility between rose apple and jamun. And pre-fruit set flower drop was more in Syzygium sp. Kataoka *et al.,* (2003) in kiwi and Noguchi *et al.,* (2002) in strawberry.

Conclusion

Jamun fruits treat as new emerging fruit crop for future due to having high neutraucitical properties. Although, the fruits have maximum shelf life of only 5 days at room

temperature. So, this study on shelf life and interspecific crossing of jamun collections will helps, to further development of genotypes Dhoopdal, Selection-45 and Savadatti to improve shelf life in jamun.

References

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Table 1. Shelf life study of jamun genotypes

Genotypes	Weight (g)					TSS (°B)					Acidity (%)				
	Days					Days					Days				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Dhoopdal sel-20	11.80	11.30	10.70	10.30	10.0	21.00	22.50	24.00	25.70	22.20	1.30	1.10	0.80	0.90	1.20
Selection-45	12.10	11.45	11.22	10.75	10.08	21.00	21.50	22.00	24.80	21.60	1.10	0.90	1.30	1.42	1.34
Selection-58	7.80	7.52	7.37	7.04	6.80	17.00	17.70	19.20	19.80	18.30	0.80	0.60	0.65	0.77	1.00
Savadatti	12.20	11.84	11.73	11.40	11.00	18.00	19.00	19.50	18.00	18.00	1.40	1.20	1.28	0.98	1.30
Kaithnal	7.20	6.94	6.44	6.23	5.92	20.00	23.50	26.00	24.50	22.00	1.50	1.30	1.50	1.20	1.40
AJG-85	8.20	7.90	7.51	7.11	6.79	21.00	21.50	23.70	25.90	25.20	1.70	1.62	1.50	1.60	1.90
Dharwad-3a	1.30	1.13	0.89	0.59	0.55	28.00	28.40	29.00	28.30	26.00	2.40	2.30	2.12	2.32	**
Madhya Pradesh -5	0.90	0.60	0.56	0.43	0.40	16.00	17.50	19.00	18.00	--	3.10	3.20	3.41	3.20	**

(--: not suitable for TSS estimation)
(**: not suitable for Acidity estimation).

Table 2. Crossability percentage in between Syzygium species

	No. of flowers crossed	Fruit set (%)	Control (%)
S. jambos X S. cumini	100	5	3